

# Mobilizing R&D in bringing change to agriculture and fishery



## 2015 ANNUAL REPORT




Department of Agriculture  
Bureau of Agricultural Research









**“ I have seen firsthand that agricultural science has enormous potential to increase the yields of small farmers and lift them out of hunger and poverty. – Bill Gates**







Mobilizing R&D in bringing change to agriculture and fishery

# CONTENTS

## 2015 BAR Annual Report

<b>MESSAGE FROM THE DIRECTOR</b>	6
<b>ABOUT BAR</b>	8
<b>INTRODUCTION</b> Mobilizing R&D in bringing change to agriculture and fishery	10
<b>BANNER PROGRAMS</b> Community-based Participatory Action Research National Technology Commercialization Program	14
<b>SECTOR-DRIVEN R&amp;D</b> Organic Agriculture   Climate Change   Biotechnology   High Value Crops   Biofuels   Rice   Corn and Cassava   Soybean   Rubber   Adlay   Apiculture   Native Animals	35
<b>R&amp;D PRIORITIES</b> Basic and Strategic Researches   Research Policy Advocacy   International Partnerships   Human Resource Development   R&D Facilities   Information and Communication Technology   Knowledge Management	48
<b>CLIENT-ORIENTED SERVICES</b> R&D Technology Commercialization Center Scientific Literature Services Intellectual Property Support	67
<b>MAJOR EVENTS</b> 1 <sup>st</sup> Philippine International Biomass Conference Symposium on Collaborative RDE Program on Climate Change 11 <sup>th</sup> Agriculture and Fisheries Techno Forum and Product Exhibition 27 <sup>th</sup> National Research Symposium 2 <sup>nd</sup> CPAR Congress	77
<b>ANNEXES</b> Awards and Recognitions Activity Highlights BAR Key Officials	96



# MESSAGE

from the Director





**O**ver the years, the Bureau of Agricultural Research (BAR) has grown into an institution known for actively partnering with Filipino researchers who can deliver relevant technologies and innovations that will help the agriculture and fishery sector achieve food security and alleviate poverty particularly in the farming and fishing communities attain progress.

Guided by its mandate, vision, and mission, BAR has proven its capacity to stand firm despite the various challenges and impending changes and continuously leave a significant mark in the agri-fishery R&D sector.

Grateful of the trust and confidence that the Department of Agriculture (DA) has for the bureau, as manifested by its increasing budget for grant funds, BAR remains steadfast on its goals in strengthening agri-fishery R&D to create opportunities for livelihood, profit, and income.

Managing the R&D component of various programs of DA, the bureau sees to it that projects implemented through its support, are instrumental in uplifting the situation of our farmers and fishers — the most distinct of which are those under our banner programs, the CPAR and the NTCP. This remained true for 2015.

Anticipating the tasks ahead, BAR continued to intensify its planning and coordination within and outside the bureau in 2015. This proved helpful with the number of national and international events that we facilitated and managed to ensure that the agri-fishery R&D will remain, if not more, competitive and competent especially with the 2015 ASEAN integration.

Highlighting 2015 in terms of events facilitated was BAR's collaboration with Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and DA Adaptation and Mitigation Initiatives in Agriculture (AMIA) in the conduct of the "Symposium/Workshop on Planning a Collaborative Research, Development and Extension Program on Climate Change among APEC Member Economies," the results of which were greatly recognized during its presentation during the APEC Food Security Week Meetings in Iloilo City. The bureau also

spearheaded an international event, the "2015 Philippine International Biomass Conference" on June 16-18, 2015. It was in this event that we proved, once more, that aside from our technical capacities, BAR can effectively plan for and facilitate an international event with hundreds in attendance. On top of these, we continue to take pride in annually conducting three major events, the Agriculture and Fisheries Technology Forum and Product Exhibition every August, the National Research Symposium every October, and the National CPAR Congress every November. The programs and activities that we handle and manage continue to grow bigger, proving their essence to both the department in advancing its thrusts and priorities, and the general public who is craving for valuable results from agri-fishery R&D.

The planning of the activities proved to be beneficial to the R&D programs that BAR coordinates as each were successful, not only in terms of implementation and accomplishments as regards to targets, but also in ensuring that researchers, farmers, and fishers remain robust and resilient despite the demands and challenges that the year may bring in.

This publication gives you a glimpse of the year that was for BAR. It includes the challenges that we faced and successfully overcame, the accomplishments, the major events that opened opportunities and partnerships, and much more. Very importantly, it gives you a taste of how we work at BAR. It is a reflection of our commitment and dedication — our shared vision of continuously pushing agri-fishery R&D to the top to ensure a better life for our farmers and fishers.

This report serves as our sign of gratitude and acknowledgement to all our R&D partners and institutions that have helped and supported us as we continue to grow to an institution that we aspire to be. We recognize how BAR, as a coordinating agency, requires strong partnerships and collaborations toward fulfilling its goal — to always be in the service of agri-fishery researchers for the benefit of our farmers and fishers and the rest of the Filipinos.



DR. NICOMEDES P. ELLAZAR, CESO IV





The Bureau of Agricultural Research (BAR) is a staff bureau of the Department of Agriculture (DA) tasked to coordinate agriculture and fisheries research and development and to ensure the application of its full potential to improving the sector.

BAR 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.





# About BAR

## 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



# Mobilizing R&D

in bringing change to agriculture and fishery



“

It is not the strongest species that survive, nor the most intelligent, but the ones most responsive to change.

”

– Charles Darwin



One may encounter an Amorsolo painting of a rustic setting – usually an agricultural landscape depicting the planting and harvesting of rice. At the center of such a work one would find the Filipina binibini, a picture of innocence and sweetness symbolic of the unspoiled life in the rural areas of the sultanate or the barangay of pre-Hispanic times. Seeing such a work of art brings us to an idyllic world, as contrasted to modern urban life, with all its romantic implications.

But, like a flash of lightning, the rudeness of reality jolts us back to full wakefulness. As former Agriculture Secretary Carlos Dominguez used to say back in the 1990s, “agriculture is no longer business-as-usual”. It is a serious business, one that needs the watchful eyes of an entrepreneur. In today’s world, those eyes must ever be alert for the agricultural issues and challenges of the times.

Poverty is a persistent problem as it refuses to go away. Despite its best efforts, government has not succeeded in reducing its incidence with about a fourth of the population remaining below the poverty line (as of early 2014). With poverty come the twin spectres of hunger and malnutrition. Compounding the difficulty of providing enough food is the steady reduction of farm land as a result of land use conversion for other purposes such as housing, industrialization, and recreation.

The Philippines may have attained positive growth rates over several years but these have not been enough. Agricultural growth remains low, affecting overall economic growth which becomes particularly significant as it provides employment for one-third of Filipinos.

Looming over the horizon is climate change which can adversely affect local agricultural production. With its plethora of environmental woes, it will have a global impact on international commodity prices which, in turn, can have negative effects on both the national economy and agriculture over the long term.

In a 2015 policy forum on climate change and agriculture, Secretary Arsenio M. Balisacan of the National Economic Development Authority (NEDA) outlined a “call to action” towards further market liberalization, increased investment in infrastructure (including irrigation, flood control and transport), and investment in R&D. In increasing investment in agriculture, the forum took note that investment in R&D is critical in finding new ways to address and avert climate change and other disastrous situations. Multifunctional agriculture, investing in high-

value crops, combined with adoption of improved practices, and through better support services, can pave the way to increased farm productivity, consequently helping build resilience among farmers.

“Adapt or perish” is a dictum among management gurus which is said not in a hushed tone but aloud. Enterprises that do not adapt can be in for a lot of trouble. The fate of the dinosaurs is often cited in that if a manager ignores the changes in his company’s circumstances, his/her organization can go the way of the dinosaur which is demise. A modern dinosaur, NOKIA, the cellphone maker has been set as the example that is not to be copied as this company failed to read the trend that smartphones are the way to go and insisted on continuing the production of the basic cellphone and thus was eliminated as a major player in global telecommunications. The lesson is that in a changing environment, those who adapt have the best chance of surviving.

In some of the cooler parts of Australia, climate change is resetting the seasons with shortening cold periods and increasing evapotranspiration rates. Farmers have to learn how to grow more of the tropical crops as temperate plants are getting less able to produce under the changing environment. Also, new pests and diseases are coming in. Those unable to cope with the changes have left agriculture.

In an increasingly gloomy agricultural scenario, agricultural R&D can provide the means for Filipino farmers to adapt to change. With its thrusts and its various research programs developed through the years, BAR and the research system are working to improve production efficiency in agriculture and fishery and promote sustainability and resilience at the same time. It is doing its part in developing sustainable and competitive agri-food enterprises including markets for various farm products. For more effective climate change risk management, BAR partners with research institutions in developing improved and resilient germplasm of food crops and livestock, farm management systems, alternative livelihoods for farming families, and the training of trainers of the DA and local government units (LGUs) for assisting small farmers, among others.

Year 2015 was a good year for R&D. With increased focus and resources for agricultural research for it to respond more effectively to climate change and other dire developments, the bureau looks forward to an even more fruitful and satisfying 2016.



# BANNER PROGRAMS





# Community-based Participatory Action Research

In the last five years of CPAR implementation, data showed that there is a continuous increase in the number of CPAR projects being funded and coordinated by the bureau. From 42 on-going projects coordinated by the Project Monitoring and Evaluation Division (PMED) in 2011, it significantly increased to 86 on-going CPAR projects by the end of 2015 (*Figure 1*).

Over five years, a total of 258 CPAR projects were already implemented across all regions, 40 of which were focused on fisheries. CPAR covered 564 sites nationwide with 12,827 beneficiaries as of December 2015.

More than what the data reflects, the bureau, through CPAR, one of its flagship programs, showed that it has moved beyond categorical approaches in agri-fishery research and development. This has allowed greater flexibility while building up the trust of many farming and fishing communities and steering lasting and

tangible benefits for the farmers and fishers that extended to their local communities.

Over the years, CPAR has been recognized as a successful model of a participatory research because of its growing number of success stories as shared by CPAR project implementers and most especially, by farmers and fishers themselves. Through the regular conduct of monitoring and evaluation (M&E) activities spearheaded by PMED, notable CPAR accomplishments and successful project implementations were documented and verified at the project and farmer levels.

Part of strengthening and promoting the CPAR program was the institutionalization of the yearly conduct of the "National CPAR Congress," which highlights the different strategies of CPAR, involving the conduct of Participatory Rural Appraisal (PRA), production and post-production, roll-over scheme, and linkaging/developing partnerships.

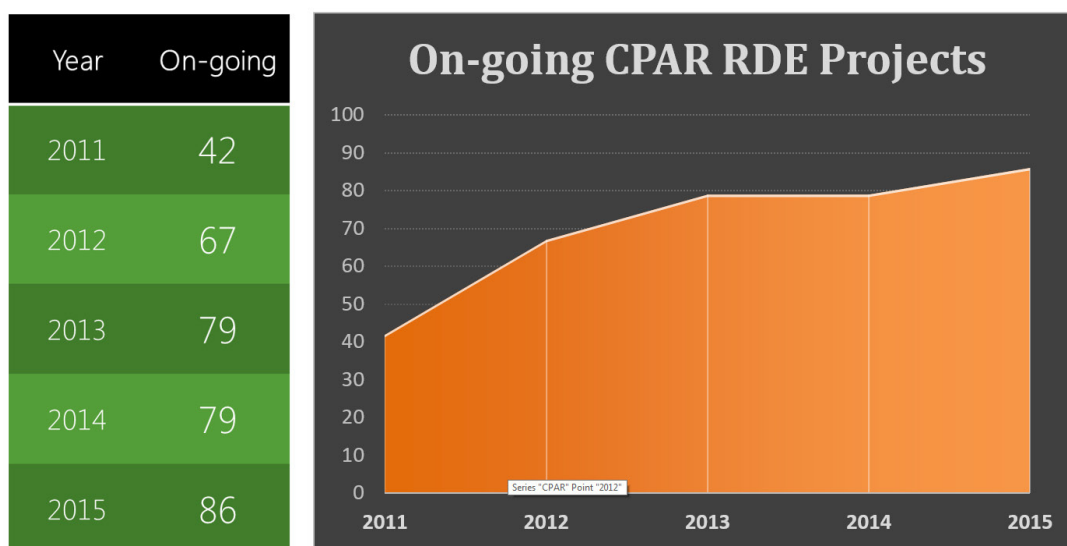


Figure 1. On-going CPAR RDE Projects coordinated by BAR



# CPAR

## Success stories

CPAR is a downstream research designed holistically to serve as a platform for researchers, farmers, and community members to participate and be involved with the aim of improving the conditions of the farming and fishing sectors.

There are many different ways to measure the effectiveness of a program. For CPAR, it succeeded if the intervention or technology introduced resulted to an increase in production and income.

For 2015, there were at least eight successful CPAR projects monitored and documented.





1

## **CPAR on Rice – Corn – Corn + Livestock Farming System**

Implementing Agency: DA-RFO 1, Ilocos Integrated Agricultural Research Center

The project introduced an additional cropping season and livestock integration to their usual practice of planting rice-corn. With this introduced technology, farmers were able to maximize the use of land and increase both their production and profit. Farmers were introduced to organic fertilizer and/or compost + bio-fertilizer + inorganic fertilizer, use of leaf color chart (LCC) for the proper time of Nitrogen application, use of light trap, release of biological control agents such as earwigs, and crop residue utilization for crops. For livestock raising, the project leaders from the region introduced Integrated Goat Management Technology to the farmers. This package of technology enabled the farmers in Sto. Domingo, Ilocos Sur to improve their farm practices, that has led to improved production and income.

2

## **CPAR on Jackfruit Production in Mahaplag, Leyte**

Implementing Agency: DA-RFO 8, Eastern Visayas Integrated Agricultural Research Center

Jackfruit is considered as one of the high value crops and is a priority commodity in the Eastern Visayas region. However, the supply of the region does not meet the market demand due to its low productivity due to lack of technical knowledge on proper cultural management and processing, and occurrence of pests and diseases. This pressing issue on jackfruit production and commercialization was specifically addressed through interventions and technology introduced in the CPAR. Farmers were provided with and trained on various technologies such as integrated pest management, production management particularly proper harvesting methods, and processing of jackfruit products such as pastillas, tart, jam, and jelly. The introduced technologies through CPAR contributed to a significant increase of yield from 8 metric tons to 15 metric tons per hectare after its two-year implementation. Production areas expanded to 11 hectares, number of farmer-cooperators rose from 22 to 52, and the average income boosted from P96, 250 to P317,500.

3

## **CPAR in Upland Farming Communities in the Province of Albay and Camarines Sur: Promotion of Farm CARE**

Implementing Agency: DA-RFO 5, Bicol Integrated Agricultural Research Center

The project aimed to increase farmers' productivity and income in the upland areas through the development of appropriate and location-specific technologies and interventions. It sought to enhance the role of R&D in production management systems, transfer of technology, and resource management towards agricultural productivity in the region. Among the technologies introduced to the farmers through CPAR were production and weed management systems, and diversification of farms which meant planting rice along with livestock and poultry, fisheries, rootcrops, and even forest and fruit trees that provided them additional sources of food and income. Farmers were also taught the importance of building partnerships with non-government organizations, which in turn helped them in the conduct of varietal adaptability trials for rice, enabling them to identify the varieties suitable in their respective farms. The CPAR Farm CARE project developed a pool of farmer-trainers who became resource persons during training workshops. Also, it was able to establish techno-demo farms showcasing different technologies that the farmers acquired from the project.



# 4

## CPAR on Sugar Apple (Atis) + Vegetables + Legume Farming System in Lobo, Batangas

Implementing Agency: DA-RFO 4A, Southern Tagalog Integrated Agricultural Research Center

Generally aimed to improve farmers' yield and income, the project targeted to equip smallhold farmers with efficient irrigation technology, new crops to integrate in their existing crops, and an organized association for atis farmers. Having identified the needs of the farmers to address production issues on atis through PRA, the CPAR project provided 20 farmers from two barangays in Lobo with new irrigation systems that included the construction of water reservoirs and the procurement of water pumps, power sprayers, and plastic drums. In two weeks' time, farmers already noticed significant developments in the quality and quantity of their yield. Part of the project involved training farmers in intercropping legumes and vegetables with atis. The farmers learned that planting different crops can preserve the soil, thus promoting soil and crop health, leading to increase in the productivity of the atis farmers.

# 5

## CPAR on Corn and Vegetable-based Integrated Farming Systems

Implementing Agency: DA-RFO 7, Central Visayas Integrated Agricultural Research Center;  
Office of the Provincial Agriculturist Cebu Province

A corn-based municipality, farmers in Alacantara, Cebu are planting Tinigib, a local variety. CPAR introduced an improved variety, the OPV Variety 6, and three cropping seasons as part of the CPAR intervention. Instead of the usual two cropping systems, farmers grow corn for three cropping seasons (OPV + OPV + *Tinigib*). With the implementation of the CPAR project, additional vegetable production was also introduced including growing of tomato, bitter gourd, eggplant, squash, and pepper. Integration of vegetables was introduced to the farmers to provide them additional yield and income. Also part of the CPAR intervention was the capacity-building of farmers. They were taught effective farming systems, soil and water management, farm recordkeeping, and livestock integration.

# 6

## CPAR on Cacao-based Production Systems in Polillo, Quezon

Implementing Agency: DA-RFO 4A, Southern Tagalog Integrated Agricultural Research Center

CPAR introduced integrated farming systems to the community of Polillo, in the province of Quezon, adding commodities such as cacao, backyard vegetables, and vermicompost production into existing production of coconut and banana. The integrated farming systems taught to the farmers has greatly changed their way of living because of the significant increase in their production and income. This led their association, the Cacao Growers Association, to market their products not only within their barangay but to the city of Polillo. Just last year, they were able to sell 10,000 seedlings of cacao, the earnings of which went to the association, a good sustainability measure of a CPAR project. Also, farmers were grateful for the learnings they have acquired from the various CPAR trainings they were provided such as vermicompost production, grafting, farm recordkeeping, and vegetable integration.





# Success stories





# CPAR

## Success stories





# 7

## CPAR on Organic Vegetable Production Project

Implementing Agency: Provincial Agriculture Environment and Natural Resources Office (PAENRO), Provincial Local Government - Ifugao

CPAR has contributed to Ifugao's province-wide campaign on organic farming especially at the farmer level, and has been gaining positive feedback and outcome from CPAR cooperators particularly in Kiangan and Lagawe. Introduced package of technology of the CPAR project include organic integrated farming which entails land preparations and planting practices that improve soil fertility, as well as various pest control management techniques that are not harmful to the soil and the crop alike. The project has since realized good impressions within communities, because of the increasing awareness of small scale farmers, motivating them to engage in organic production of vegetables. Matter of fact, CPAR has brought about the development of farmer-leaders and farmer-trainers in the province, whose farms were registered and certified as learning sites for integrated organic farming. Also, another notable output of the project is the establishment and operation of a display center near the provincial capitol in Lagawe, where farmers regularly sell their vegetable produce.

# 8

## CPAR on Integrated Rice-based Farming System in Leon, Iloilo

Implementing Agency: Office of the Municipal Agriculturist and LGU, Leon, Iloilo

Showcasing the integration of high value crops particularly vegetables, and livestock to rice production, this CPAR project in Barangays Buga and Tina-an Norte, Leon, Iloilo was able to improve the capability and productivity of the local farmers. The Palay Check System, as well as organic production of vegetables contributed to the increase in income of the farmers while lowering their production cost. Farmers have significant yield increase from 80 to 100 cavans per hectare for rice. The intervention of cattle fattening enabled farmers to earn an additional Php 10,000 per cattle in six months. An effective community management system was promoted through CPAR, because there is a significant growth in the number of members in the farmers' association from 10 to 46 farmer-cooperators.







# National Technology Commercialization Program

The National Technology Commercialization Program (NTCP), launched in 2006 as one of the flagship programs of BAR, was established to complement CPAR to ensure that mature and commercializable technologies generated from research will be made available to agriculture and fisheries stakeholders.

In 2015, BAR, through the Technology Commercialization Division (TCD), received 175 project proposals out of which 77 were approved and funded. A total of 129 projects are being handled by TCD including 52 on-going projects. The number increased compared to last year's 56 new projects.

The crops still got the largest share of funded projects followed by livestock, other projects (including capacity building), and fisheries (*Table 1*).

The AFMA Regular Fund provided the largest allocation for NTCP with 64 projects followed by HVCDP with 48 projects, organic agriculture (OA) with 13 projects, and corn and rice with two projects a piece (*Table 2*).

Table 1. New and On-going NTCP projects by commodity.

Commodity	CY 2015 Physical Accomplishments	
	New	On-going
Crops	54	33
Livestock	13	9
Fisheries	3	4
Others	7	6
<b>TOTAL</b>	<b>77</b>	<b>52</b>

Table 2. New and On-going NTCP projects by fund source.

Fund Source	CY 2015 Physical Accomplishments	
	New	On-going
AFMA	40	24
HVCDP	29	19
OA	5	8
Corn	1	1
Rice	2	0
<b>TOTAL</b>	<b>77</b>	<b>52</b>



## Commercialized Technologies

Whenever there are new and mature technologies ready for dissemination, BAR strives to increase technology adoption and utilization thereby providing livelihood opportunities for the farming and fishing communities. Technology commercialization plays a vital role in making this step forward.

BAR, through its NTCP, was instrumental in commercializing 13 technologies that were generated by partner research and academic institutions (*Table 3*).

Table 3. Commercialized technologies through NTCP

	<b>Project Title</b>	<b>Implementing Agency</b>	<b>Description of the technology supported for commercialization</b>
<b>Crops</b>	Processing Technology Development and Utilization for Organically Grown Arius Fruits in Batanes	Batanes State College	Development of six products from Arius, an indigenous berry from the Batanes, with great potentials. The products include wine, jam, tart, pastillas, jell, and tea.
	Increasing Marketability of Safe and Quality Vegetables and Culinary Herbs through Postharvest Handling Practices and Packaging Technologies	University of the Philippines Los Baños Foundation, Inc. (UPLBFI)	Postharvest handling protocols and technologies for bulb onion to reduce losses.
	Technology Promotion and Packaging Development of High Value Products from Selected Indigenous Fruits	UPLBFI	Establishment of quality assurance system for fruit wine, cordial, and other high value products; and improvement of product presentation through proper packaging design.
	Utilization of Batuan [ <i>Garcinia binucao</i> (Blanco) Choisy] into Value Added Products	UPLBFI	Development of novel and value-added processed products from batuan; standardize processing parameters and develop formulation for the different batuan processed products.
	Batuan ( <i>Garcinia binucao</i> ) Biodiversity Research, Conservation, and Propagation in Region 5 (Masbate and Sorsogon)	Bicol Integrated Agricultural Research Center, DA-RFO 5	Best practices in producing Batuan that can help the interested individuals who want to invest in this crop.
	Lotus R&D for Region 3: Production Technology Generation for Food and Non-Food Products, Aesthetics and Medicinal Purposes	Pampanga State Agricultural University	Development of lotus-based safe and healthy food and non-food products, and medicines.
	Technology Utilization and Promotion of Sweet Sorghum Food Products	BAPAMIN Farmers' Cooperative	Production of sweet sorghum value-added product on a commercial scale using developed technologies including vinegar, syrup, hand sanitizer, sweetener, and flour.
	Site Specific Evaluation of Sweet Sorghum Organic Production of UPLBFI	UPLBFI	Development of organic sweet sorghum production through organic process.



	<b>Project Title</b>	<b>Implementing Agency</b>	<b>Description of the technology supported for commercialization</b>
<b>Livestock and PNAD</b>	Improvement of Processing Technologies for Meat and Skins from Selected Strains of Native Pigs	Animal Products Development Center, Bureau of Animal Industry	Development of processing technologies for the meat and skin of Black Tiaong strain of Native Pig. The project standardized the recipe for lechon; developed recipes for bacon, tapa, sausage and hotdog; and formulated a recipe for improved processing of pigskins.
	Developing the Potential of Native Pigs for Organic Meat Production	University of Rizal Systems	Development of technology on feeding using Trichantera and other indigenous feeds. The project tested the nutrition and feeding of native pigs for best quality of organic meat that can be considered organic and the most efficient growth performance.
	Native Swine for Lechon de Leche Production: Improving Feed Availability through Integration of Sakwa as Forage Feed in Coconut-based Production System	UPLBFI	Development of technology on improved feeding of Sakwa, the corm of Gabing San Fernando, to be utilized as feed to improve nutrient availability and increase the average daily gain. It can be substituted for corn as feed ingredient by as much as 60-90 percent.
<b>Fisheries</b>	Development of Technology for Efficient Microalgae Production: Photobioreactor Design, Feed and High-value Metabolites	Ateneo De Manila University	Enhanced yields of high value molecules by manipulating the microalgal growth conditions using the photobioreactors (PBR). Ongoing works on the photobioreactor systems involve prototypes designed to probe the effects of various parameters such as photoperiod duration, light wavelengths and CO2 exposure on microalgal growth.
	Development of New Areas for Seaweed Farms	UP Diliman – Marine Science Institute	Utilization of floating methods of culture, e.g. single and multiple floating long line methods to expand farming to deeper areas. The project assessed and developed new areas into seaweed farms in the Bolinao-Anda reef complex in Pangasinan. The project demonstrated the potential of integration of seaweeds into nutrient-rich areas (in fish mariculture areas) for bioremediation and economic diversification.



## Technology Sourcing

The TCD visited five regions for technology sourcing activities to solicit new products from different R&D agencies and institutions. These were:

**Region 1** (Don Mariano Marcos State University and Mariano Marcos State University)  
**Products sourced:** Nipa wine, e-kawayan, charcoal briquette, seaweed flakes, seabon, dragon fruit pasta, malunggay pretzel

**Region 2** (Isabela State University-Cabagan and Echague campuses, Quirino State University, Nueva Vizcaya State University, and Cagayan State University)  
**Products sourced:** camote vinegar, bamboo catsup, chevon canned products, cacao products (tablea tops, kisses, candies), and soybean bakery products

**Region 3** (Tarlac College of Agriculture and Central Luzon State University)  
**Products sourced:** brown rice ice cream, tilapia choco chip cookies, fruit liqueur, cherry tomato products

**Region 8** (Visayas State University)  
**Products sourced:** jackfruit marmalade, jackfruit seeds coffee, sweet potato ketchup, tarroz or taro-rice sweet wine, cassava chips

**CAR** (Ifugao State University, Apayao State College, Kalinga Agricultural State College, and Benguet State University)  
**Products sourced:** sweet potato bread, *camarind* (camote and tamarind), camote vinegar, *Tinawon* rice baby food, banana blossom *embutido*





## Technology Business Incubation

A roundtable discussion, organized by TCD and WorldFish Center, was conducted on 26-27 November 2015 with the aim of establishing a Technology Business Incubation (TBI) that will be handled by BAR. The activity sought to solicit information on how the TBI will complement the activities being conducted under NTCP and how to further strengthen R&D and innovation in the country.



Once institutionalized, the TBI will be anchored on a comprehensive (national) innovation system that is able to nurture emerging technologies and support the growth of agriculture and fisheries-based micro small medium enterprises (MSMEs). This may include technology assistance and scientific consulting, business-support services including access to shared service facilities and laboratories, fund syndication and market linkages – all directed to harness a favorable ecosystem for the competitive Philippine agribusiness.



## Technology Commercialization on Wheels



The Technology Commercialization on Wheels or TCoW was established with the purpose of bringing technologies generated from R&D closer to people. The TCoW will travel across Luzon for a wider reach of dissemination.

The truck was customized to fit swing-out display/exhibit racks for the POTs and products to be displayed. It also has a crew cabin, compartments for the necessary equipment, electrical outlets, and a computer area. The vehicle was carefully designed to cater to the main purpose of the project, which is to strategically showcase and transfer POTs and knowledge products to normally inaccessible areas.



# NTCP Success Stories



## 1

### Commercialization of Off-season Tomato Production Technologies

Implementing Agency: Tarlac College of Agriculture (TCA)

The seasonality of tomato in the Philippines results to major constraints including higher price during off-season, limited sources of good quality planting materials, and lack of supply of fresh and processed tomato products for the local and international markets. With this, an off-season tomato technology developed by the Asian Vegetable Research and Development Center (AVRDC) was brought to the Philippines in 1999.

According to Dr. Tessie A. Boncato, project leader, grafting of tomato to an eggplant variety EG203 tolerates flooding and showed considerable resistance to bacterial wilt. Package of technologies (POTs) employed included during the off-season tomato production included the use of raised planting beds, plastic mulch, trellis, and rain shelters (protective structures).

Inspired with the positive outcomes of the off-season tomato production technology, TCA conceptualized the project with funding support from BAR.

After series of trainings conducted in Tarlac under the project, the farmer-attendees formed the North Central Luzon Tomato Stakeholders Association (NOCELA). Through the assistance of the Department of Labor and Employment, NOCELA now handles the production and processing of various tomato-based products in Tarlac. These include: dried tomato, vinegar, tomato jam, and tomato candies and chips.

Tomato processing promotes zero waste management. The dried tomato pulp serves as the main ingredient of tomato and *tuyo* sauce, the squeezed juice can be processed into vinegar, while the peeled skin and other wastes are supplied to the native pigs and chicken raised in the area.





## 2 Lotus Production Technology Generation for Food and Non-Food Products, Aesthetics and Medicinal Purposes

Implementing Agency: Pampanga State Agricultural University (PSAU)

Due to the growing potentials of lotus as an alternative vegetable and ornamental crop, Dr. Norman de Jesus, PSAU professor and researcher, studied the anti-inflammatory, wound-healing, and anti-microbial properties of the lotus plant by understanding the crop's basic biology and physiology as well as identifying the lotus varieties which can be good sources of food and non-food products, ornamentals, and medicine.

PSAU's research team successfully established experimental set up both for under net house and open ponds conditions. The flowing lotus varieties are relative to pre-sowing treatment of seeds, planting distance, tilapia integration, and fertilizer application under the open ponds condition; and size of containers, depth of water and fertilizer application under net house condition.

The strategic area for experimental set-up made it accessible to potential technology users, adopters, and visitors. About 200 individuals were given orientation and demonstration of lotus production and value-adding technologies. Through this activity, lotus food and non-food products were also showcased such as tea, lotus in adobo style, lotus stewed in coconut milk (*laing*), ointment, soap, shower gel, aromatic oil, lip balm, and body scrub.



## 3 Conservation and Product Development of Batuan

Implementing Agency: DA-Bicol Integrated Agricultural Research Center (DA-BIARC) and University of the Philippines Los Baños-Food Science Cluster (UPLB-FSC)

Batuan is now being given emphasis by the DA to further explore its potentials. The DA-BIARC established a batuan nursery at the Carabao Breeding Center in Masbate and Sorsogon Dairy Farm to increase batuan production.

Together with the LGUs, surveys including documentation and collection of planting materials in identified growing sites (Masbate and Sorsogon) were conducted. Results revealed that 21 municipalities in Masbate are already growing batuan on a backyard scale with more or less than 5,215 trees found in the province. Also on a backyard scale, two municipalities in Sorsogon were found to have batuan trees growing with 500 trees recorded.

More than being a favorite souring ingredient in Visayas, *batuan* is comparable to tamarind. It can be processed into value-adding products like pickled *batuan*, *sinigang* mix, and fruit juice powder. There is also pickled *batuan* which was packaged into sour pickled, sweet-sour pickled, and sweet pickled.



# 4

## Medium Scale Commercial Goat (*Capra hircus* Linn.) Breeding and Fattening Production through Upgrading in Lobo, Batangas

Implementing Agency: Batangas State University (BatStateU)

The study aimed to showcase a medium-scale commercial goat breeder and fattener production through upgrading.

Eighty native doe and seven purebred bucks were housed in the goat breeding demo-farm at BatStateU Experimental Farm in Lagadlarin, Lobo, Batangas. To date, it has maintained 6 native doe, 5 purebred bucks, and 38 F1 and 13 F2 offspring. Also under the project, one hectare of improved forages and grasses, along with native grasses and locally-available leguminous crops for the small-ruminants, were established.

In upgraded goat, there was a considerable average increase in weight of 22.21 percent and 11.1 percent for male and female kid, respectively.

The project facilitated the transfer of a POT to 49 local farmers. A total of 98 farmer-participants were educated on community goat genetic improvement. The women of Lobo were trained on processing flavored chevon and chevon

tapa and sausage-making. The processed chevon were subjected to nutritional analysis and consumer acceptability. Garlic and lemon grass gave a new twist to the conventional plain chevon sausage. This would be a hit among health-conscious individuals.

The development of value-adding processed products from goat signifies the need to increase the production of goat. Hence, it is important to have a well-established goat breeder stocks and comparative weight gained of F1. It also encouraged the housewives and other business enthusiasts to venture into chevon processing through value-adding that provide additional source of income for the family.

The production technologies greatly benefitted the farmers specifically those depending on farming small ruminants as their primary source of livelihood. From a monthly farmer's earnings of Php5,000 and below, the average annual earnings of the techno-adopters increased to Php111,428.26 per techno-adopter.



# 5

## Postharvest Quality Maintenance of Pummelo Fruit using Chitosan and 1- Methylcyclopropene

Implementing agency: University of the Philippines Mindanao



The University of the Philippines (UP) Mindanao is on its way in recommending an effective and practical postharvest technology to extend the shelf life of pummelo.

Mindanao, specifically the Davao region, is known as the major producer of good quality pummelo, which has made quite a name in the export markets. However, not much focus is given to postharvest maintenance of this fruit.

Due to limited researches done on postharvest quality maintenance of pummelo, a research team led by Dr. Emma Ruth Bayogan, vice chancellor for Academic Affairs and a professor in UP Mindanao, initiated the project that hopes to address postharvest losses by developing appropriate treatments to maintain good quality pummelo especially during storage and marketing periods.

The project was carried out through visually documenting various quality and condition of the pummelo fruit, evaluating postharvest quality and shelf life of cured Magallanes variety treated with

various concentrations such as chitosan and 1-methylcyclopropene (MCP), and determining optimum concentrations of treatments for best shelf life and quality.

The project has so far generated major findings including minimized shrinkage and decay as well as reduced percentage of fruit weight loss during holding and ambient conditions. Results further showed higher visual quality which varies depending on treatment duration.

The research team used Chitosan, a non-toxic biopolymer derived from chitin, bearing numerous applications in agriculture and agroindustry. It found out that Chitosan application on fruits and vegetables provided advantages for the long-term storage of foods, as its film contains an active package which allows a gradual release of preservatives, thus inhibiting fungal growth and maintaining the external appearance of the fruit for an extended period of time. Similarly, 1-MCP is a powerful new tool for delaying postharvest senescence and deterioration in crops as it specifically targets and inhibits ethylene responses. Furthermore, 1-MCP is used at low rates, has a non-toxic mode of action, and is active at very low concentrations.

In citrus fruits, as in the case of pummelo, Chitosan was found effective in improving firmness, titratable acidity, ascorbic acidity, and water storage and retention. It also inhibited the development of black spots, showing the potential of chitosan as disease resistance inducer. In the same way, 1-MCP application positively affected the postharvest quality of pummelo by reducing shriveling, decay, and weight loss. In addition, better visual quality of the fruit was maintained.



# 6

## Promotion of Native Cattle Breeding, Production and Management using Organic Approaches

Implementing Agency: Local Government Unit-Tagkawayan, Quezon

The Philippine cattle industry is composed of a few large private farms and many smallholder farms. In 2013 data released by the Philippine Statistics Authority (formerly, Bureau of Agricultural Statistics), about 93 percent or 2.32 million cattle are raised in backyard farms and only seven percent (or 174,547 cattle) is commercially raised. This provided a window of opportunity for other stakeholders and industry players to go into cattle business. One case is Tagkawayan, Quezon wherein through the initiative of its local government unit (LGU), has intensified the native cattle production in its municipality. The project hopes to revive and boost the native cattle industry of the municipality.

A Memorandum of Agreement (MoA) was entered into by farmer recipients and the Municipality of Tagkawayan to ensure that both parties understood their responsibilities. The agreement stated that the farmer recipient will receive a dam (*inahing baka*) and will only gain ownership if the dam will be able to produce offspring, which will be turned over to the LGU as it has the responsibility to disperse the offsprings to the next farmer recipients. Full ownership of the dam by the farmer recipient will only be ensured if it will be able to produce another four offspring after giving the first-born to the LGU.

The farmer recipients were enjoined to follow the recommended organic practices and technologies. Seminars were given on organic cattle production

and management, native cattle production which included the sharing of farmer cooperators' experiences, and ruminants' disease prevention and control. Study tour was also organized for farmer recipients on native cattle fattening and production in Tiaong and Sariaya, Quezon.

Some of the practices taught to the farmer recipients were the use of natural means of treating ailments of native cattle such as the use of palm fruit, ipil-ipil, alagao fruit, and *tubang aso* in making concoction for deworming; the use of guava leaves for wound treatment; the use of *alagao* leaves, *kakawate* leaves and bark, *kamaria* leaves and *makabuhay* for external parasites and; the use of boiled star apple leaves and bark, guava leaves, cogon grass, corn cobs, and *duhat* leaves for diarrhea treatment.

For the feeds, the farmer recipients were taught on using organic forage including Napier, Para grass, carabao grass, Centrosema, cogon, guinea grass, Trichantera, rice straw, corn cobs, rice bran, and coconut.

Based on the cost and return analysis done by LGU-Tagkawayan, it was estimated that the farmer recipient will have a net income of Php137, 500 in four years given that the dam remains healthy and is able to produce an offspring per year.





## 7 Promotion of the Package of Technology for Biocontrol of Major Diseases of High Value Crops in Benguet and CAR

Implementing Agency: University of the Philippines Los Baños (UPLB)

Considered to be environment-friendly through less use of toxic chemicals, the technology contributes to environment protection and conservation. Trichoderma microbial inoculant (TMI) is for the biocontrol of crop diseases and with fertilizer effect which reduces the use of synthetic fertilizers by 50 percent and reduces use of chemical pesticides.

To date, close to 600 farmers already received free samples of 50-gram sachet of Trichoderma product and 100-gram of Trichoderma activator. The latter is a fungus used for rapid composting of agricultural residues to produce compost fertilizer. More than 100 farmers are now regularly utilizing and buying this product in an outlet in Abatan, Buguias, Benguet.

Cultivated in Benguet, 24 high-value crops are being subjected into field trials. These include cutflowers (carnation, chrysanthemum, anthurium); leafy vegetables (cabbage, *wombok*, broccoli, romaine lettuce, pechay, celery); roots/tubers (potato, carrot, taro, beets, onion); fruit vegetables (beans, sweet peas, bell pepper, tomato, California pepper); fruit and plantation crops (citrus, strawberry); and grain crop (rice).



## 8 Identification and Collection of Indigenous Fruits in Palawan

Implementing Agency: Department of Agriculture-Regional Field Office 4B

In an effort to conserve indigenous and underutilized fruits, a project on identification of indigenous fruits was implemented by DA-RFO 4B (MIMAROPA), in coordination with the Western Philippines University (WPU).

The project aimed to sustainably conserve in-situ the diversity of indigenous tropical fruit species through approaches that involve various stakeholders, the promotion of public awareness, and enhanced utilization of these plant genetic resources. The identified fruits are also being looked at for their commercial production and processing properties.

According to Dr. Lerom, *dugyan* is one of the 14 indigenous tropical fruit species that was initially collected for the study. The other species include *bunog*, *badak*, *tabo*, *paratungon*, *palau saguit-saguit*, *tambis*, *maraitum*, *marang*, *langka*, *rambutan*, *lanzones*, *kandis*, and *bignay*. Out of these, seven have already been characterized and are being looked into for their economic potentials as food sources including *dugyan*. The researchers have also raised around 7,745 seedlings at WPU.

To help promote the fruit and products developed through this project, DA-MIMAROPA has been exhibiting these indigenous tropical fruit species in various fora for public familiarization and appreciation.



## 9 Adoption and Utilization of Nipa Palm Sugar Processing Technology (NPSPT) in the Municipality of Lanuza, Surigao del Sur

Implementing Agency: Foundation for Rural Enterprise and Ecology Development of Mindanao (FREEDOM), Inc.

Nipa Palm (*Nypa fruticans*), a species of palm that grows along the coastlines and estuarine habitats, is commonly used in the Philippines as roofing materials for bahay kubo or processed as vinegar (*sukang paombong*) or wine (*laksoy*). Recently, a group of farmers in Surigao del Sur are now engaged in producing a natural sweetener from Nipa Palm.

Nipa Palm sugar, with lower glycemic index, is almost like the coco sap sugar, granulated from the sap of the Nipa Palm. The process of producing Nipa Palm sugar is done naturally since this has been tapped as sap from the Nipa Palm. The sap is then converted into syrup, which is then directly cooked until it becomes granulated sugar.

Given its promising potential and increasing demand for organic products, the FREEDOM, Inc. is implementing a project that aims to provide livelihood opportunities to coastal communities and increase the income of tappers and wine processors in Barangay Aksam, Lanuza, Surigao del Sur. Components of the project include organizing innovative sap processing technology training, packaging, labeling, and market linking.

Sitio Ipil Wine Makers Association (SIWA), the chosen project's beneficiary, in partnership with FREEDOM, Inc. is managing the common service processing facility for producing high quality Nipa Palm sugar. The facility that produces the sugar on a weekly basis, houses a mechanical dryer that can process 40 kilograms of sugar per batch. "Nipa Palm sugar production is seasonal with the productive months starting from November to June while the lean months are from July to October," said John Largo who oversees the operations of SIWA.

To date, the Nipa Palm products were able to penetrate Eco Stores, a national chain of stores in Davao City and Cagayan de Oro. "Other local coffee shops have shown interest in using Nipa Palm sugar for different varieties of coffee that they sell," Mr. Peralta added.

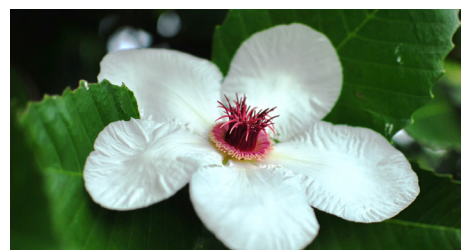
Presently, Nipa Palm sugars are packed in 150 grams stand up pouches. These are sold at PhP 150.00 per pouch. It was awarded as the "Best New Product" during the 11th Agriculture and Fisheries Technology Forum and Product Exhibition held in August 2015.



# 10

## Village-level Processing, Technology Development and Promotion of Katmon (*Dillenia philippinensis*): An Underutilized Fruit in Quezon Province

Implementing Agency: University of the Philippines Los Baños



The project, initiated by the Agricultural Systems Cluster-UPLB, hoped to explore the economic potential and value of underutilized and local trees such *katmon* for food and livelihood. The project looked into its conservation and propagation and thus be integrated into land use decisions, after all *Katmon*, bears the name – *philippinensis* – for it was first found in the Philippines.

This UPLB-BAR project has three components. The first component is the production and postharvest technology development. Locally available and UPLB-developed soil ameliorants are being tested for effects on growth of *katmon* established in Real and General Nakar, Quezon while studies on practical/low cost technique for prolonging shelf-life of fruits after harvest is currently being studied in UPLB and will be demonstrated in the project sites. The second component is the capability enhancement of rural women on processing

and product development of *katmon* fruits. The third component is the information dissemination about *katmon* and its food value.

A variety of products from *katmon* is made available today through the technology developed by the Food Science Cluster of UPLB. The newest among these is *katmon* powdered *sinigang* mix. Others are pickled *katmon*, *katmon* dessert in syrup, *katmon* juice, *katmon* jelly, and *katmon*-papaya candy roll. There has been a good indication of acceptability for these *katmon* food products to a wide range of potential consumers.

Knowledge in recapturing the value for food in an even more economically viable form was done through a series of training on processing food products from *katmon* to women groups in Quezon.







# Sector Driven R&D

**BAR kept its momentum in delivering the necessary R&D interventions in support to the program thrusts of the Department of Agriculture. Effecting changes in the agricultural and fishery landscape and mobilizing forward-thinking individuals and development-oriented groups have been the agency's pace for the year.**

Cascading the high impact results of R&D to its intended clients, the people and communities, serves as the precursor of agri-fishery development. Over the years, BAR has been at the forefront in addressing the R&D needs of the sector.

This section contains specific R&D major programs and their updates and accomplishments as well as on-going collaborations with the various stakeholders. These programs also complemented the agency's two banner programs, the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP) gearing toward agri-fishery modernization.

# Organic Agriculture

Organic Agriculture (OA) is a banner program of the Department of Agriculture. Consistent with the directions of the National Organic Agriculture Program (NOAP) and adhering to the mandates of Republic Act 10068, also known as the Organic Agriculture Act of 2010, BAR, which is tasked to facilitate the funding and coordination of R&D projects related to OA, has conducted several activities to promote and strengthen organic farming in the country.

One of the major activities of the OA program in 2015 was the conduct of the "Regional Cluster Stakeholders Consultation and Planning Workshop on Organic Agriculture RDE Agenda" in major islands of the country. For Visayas, it was held on 24–27 March 2015 in Bacolod, Negros Occidental; for Luzon on 18–22 May 2015, in Naga City, Bicol; and for Mindanao on 17–20 August 2015 in General Santos City.

BAR served as one of the evaluators for the Best Research Paper and Poster during the "First National Organic Agriculture Scientific Conference" conducted by the Organic Agriculture Society of the Philippines on 7-11 July 2015 at Benguet State University, La Trinidad, Benguet.

The bureau presented the National Organic Agriculture RD&E Agenda and Framework during the "Organic Aquaculture: North Luzon Cluster Forum" on 29 September-3 October 2015 in Baler, Aurora.

BAR, together with the research managers of the DA-Regional Field Offices, also participated in the "12th National Organic Agriculture Congress" wherein the



current R&D OA initiatives were presented. It was held on 24–27 November 2015 in Bacolod City, Negros Occidental.

It also attended in several meetings called by the National Technical Search Committee of the National Organic Agriculture Board (NOAB) as member of the On-Desk Evaluation and On-Site Screening for the nominees and selection of the 2015 National Organic Agriculture Achiever Awardees.

Since its inception in 2011, BAR has funded 168 OA R&D projects, of which 90 are on applied research, 44 are on production and post production technology, and 34 are on RDE research facilities.

For 2015, there are 39 projects funded under the OA program, 28 of which are on-going and 11 are new.







# Climate Change

Among the country's economic sectors, agriculture is the most vulnerable to climate change. The Philippines, being the third most vulnerable country in the world when it comes to disaster, puts more of its resources at further risk.

In addressing climate change risks, the Department of Agriculture (DA) established a system-wide program on climate change and pursued the Adaptation and Mitigation Initiative in Agriculture (AMIA), an initiative under the DA-System Wide Climate Change Office (SWCCO). AMIA is DA's national framework in addressing climate change in agriculture and serves as the umbrella program covering climate change across all programs, functions, and agencies at DA. It is a system-wide program that hopes to mainstream programs and projects both at the strategic and operational level which means transforming systems, adjusting development programs/projects, and capacitating people to achieve efficiency at all levels of implementation.

BAR, as the focal agency for Climate Change R&D Program, together with its partner-agencies, has crafted a revised and unified agenda for climate change to ensure that it is

relevant and that priority projects are aligned with the current climate change policies and thrusts and directions of the Department of Agriculture (DA). This was finalized with the conduct of the "2015 Small Group Discussion to Review, Update and Finalize the DA-BAR Climate Change RDE Agenda and Programs for 2016-2022" on 9-11 June 2015 in Clark, Pampanga. The major output of the activity was the Climate CC RDEAP 2016-2022.

One of the goals in updating the unified agenda for Climate Change is to ensure the mainstreaming of the bureau's initiatives when it comes to climate change R&D concerns, particularly program operations and implementation. Thus, during the meeting-workshop, specific strategies for RDE activities were identified and were aligned with the implementation of the DA-AMIA.

Another significant event under the program was the conduct of the "Symposium/Workshop on Planning a Collaborative Research, Development and Extension Program on Climate Change among APEC Member Economies" on 16-17 September 2015 in Makati. The workshop led to exploration of possible collaborative RDE works among APEC economies specifically in developing climate change-resilient agriculture. BAR also served as a technical documenter together with focal persons from other divisions during the 19th Agricultural Technical Cooperation Working Group Annual Meeting coinciding with the APEC Philippines 2015 on 28-29 September 2015 in Iloilo City. BAR Assistant Director Teodoro S. Solsoloy presented the outputs of the workshop.

Since the inception of the program in 2011, BAR has funded 25 climate change related projects. From these, 12 are completed and 13 are on-going. These projects were implemented by the different institutions nationwide, mostly from state universities and colleges.

# Biotechnology

BAR has been supporting the DA-Agriculture and Fisheries Biotechnology R&D Program through the DA-Biotechnology Program Office (BPO) in funding priority R&D projects and activities of the different agencies of DA and other stakeholders including the National Academy of Science and Technology (NAST), UPLB-National Institute of Molecular Biology and Biotechnology (BIOTECH), state universities and colleges (SUCs), and other private organizations.

As part of its coordinating activities, BAR, through its Planning and Project Development Division (PPDD), attended the "DA Biotechnology Program Steering Committee Meeting" and the "DA Biotechnology Program Annual Project Review and Assessment" on 2 March 2015 and 17-19 June 2015, respectively at the DA Central Office, Diliman, Quezon City.

BAR also participated in the 10th National Biotechnology Week with the theme, "Edukasyon sa Bioteknolohiya: Pagyamanin para sa Kinabukasan Natin" on 24 November 2015, at the CHED Central Office, C.P. Garcia Avenue, UP Diliman Camp, Quezon City; and the launching of the "Scholarship Program for AgriBiotech Students" on 23-27 November 2015 at SM Dasmariñas, Governor's Drive, Pala Pala, Brgy. Sampaloc, Aguinaldo, Cavite. Both events were spearheaded by the Department of Science

***Strengthening agricultural biotechnology has paved the way for the development and validation of technologies which have been highlighted in some of the bureau's funded and coordinated projects.***



and Technology (DOST). The events highlighted the benefits and contributions of biotechnology to agriculture and food security; delivery of equitable health care service, sustainable environment; and development of industries and economy.

In partnership with the DA-Biotechnology Program Office, BAR provided assistance in funding and coordinating 62 biotechnology-related projects, of which 23 are new and 39 are on-going.

The 23 new biotechnology projects are composed of 12 applied research; 4 institutional capacity enhancement; 5 information, education and communication; and 2 policy research and advocacy.

R&D initiatives covered under the applied biotech research include pest/disease management, biotechnological conversion and utilization of wastes/by products of several crop commodities, genetic improvement, and genetic diversity for livestock.

Strengthening agricultural biotechnology has paved the way for the development and validation of technologies which have been highlighted in some of the bureau's funded and coordinated projects.





## High Value Crops

Office, Quezon City; joined in the “NMAT-TWG meetings on Inputs and Production Technology” on 27 August 2015 and 26 November 2015; and provided technical and financial assistance to the Philippine Rubber Research Institute (PRRI) during the conduct of the “IRRDB-PRRI-BAR International Workshop on Rubber Agronomy and Technology Transfer” on 25-27 August 2015 at Limketkai Hotel, Cagayan De Oro.

The bureau also attended several PCAF Committee and Sub-committee meetings on Commercial Crops, including 1) Fruits and Vegetables on 23 September 2015; 2) Cacao Industry Development on 28 October 2015; 3) Rubber Industry Development on 4 November 2015; and 4) Commercial Crops Committee on 2 December 2015

In 2015, BAR coordinated 84 projects under HVCDP, out of which 54 projects are on-going and 30 projects are completed. Majority of the HVCDP projects include fruits (44 percent), and vegetables and rootcrops (24 percent) as reflected in *Figure 2*.

The High Value Crops Development Program (HVCDP) is one of the banner programs of DA designed to seek measures in addressing food security, alleviate poverty, and sustain the growth of fruits and vegetables industry, as well as other industrial crops.

Other than the identified priority crops, BAR facilitated several R&D activities anchored on strengthening the program, and has supported food legumes including adlay, soybean, and rubber.

Under the program, BAR monitored HVCDP projects in Davao City on 16-17 April 2015 and at UPLB on 20-22 October 2015; attended and participated in “2016 HVCDP Budget Proposal Preparation Workshop” on 27-30 January 2015 at the DA Central

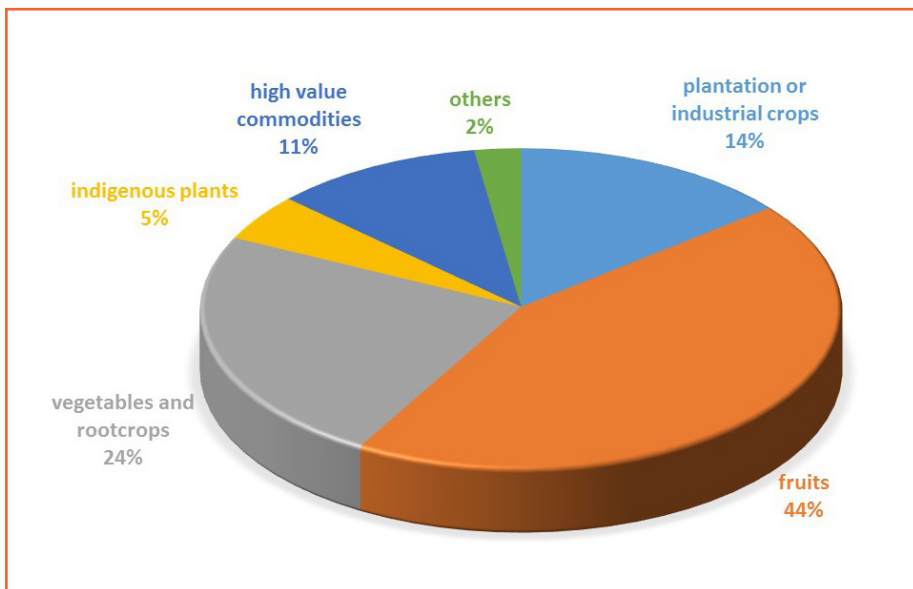


Figure 2. HVCDP projects for 2015

# Biofuel

The program was established to focus on the establishment of R&D mechanisms that will ensure the identification and availability of alternative and renewable energy. In support to the DA's Biofuel Feedstock Program, BAR's Biofuels R&D Program supports biofuel feedstock researches which may include identifying new feedstock, developing high yielding varieties, and developing new processing technologies in cooperation with public and private research agencies, and international research institutes.

In 2015, BAR, in partnership with the Interdisciplinary Biofuels Research Studies Center (IBRSC) of UPLB, conducted the "2015 Philippine International Biomass Conference" which was attended by major stakeholders and representatives both from public and private sectors. The conference aimed to explore the market potentials of biomass as source of bio-based fuels and energy. President Benigno Simeon C. Aquino III was represented by Department of Energy Undersecretary Raul Aguilos as the luncheon speaker. Other important guests were Dr. William D. Dar, president of Inang Lupa Movement; and Dr. Bernardo D. Tadeo, president and CEO of Full Advantage Phils. International. The event was held on 16-18 June 2015 at the Widus Hotel and Casino, Clark Pampanga.



BAR, through TCD, also attended and participated in meetings and workshops including: 1) "Harmonization Workshop for the Formulation of the Agricultural and Fisheries Mechanization RDE Agenda (AFMEC-RDEN)" on 6-8 April, PhilMech, Muñoz Nueva Ecija; 2) "Workshop for the Preparation of the National Agriculture and Fishery Mechanization Program (NAFMP)" on 28-30 April 2015, Maharlika Resort, San Jose Nueva Ecija; 3) "AFMEC-TWG on R&D – Task Force on Local Assembly and Manufacturing" on 23 September 2015, PCAF Conference Room, Quezon City; 4) "Special Meeting of the AFMEC TWG on Training and Extension" on 28 October 2015, PCAF Conference Room; 5) "Area-wide Consultation Workshop of NAFMP for Luzon A and B" on 2-4 November 2015, Eurotel, North Edsa; and 6) "3rd ASEAN Conference on Agricultural and Biosystems Engineering" on 9-11 December 2015, Century Park Hotel, Manila.

As of 2015, BAR funded 10 biofuel projects, of which 5 are new, 1 is on-going, and 4 are completed.

The nature of the projects covered the adaptability trials (super sweet sorghum) and harnessing the potentials of super sweet sorghum, production of saccharine feedstocks for the (production) of high value products as well as the development and commercialization of naturally grown sorghum for silage production for dairy buffaloes.







# Rice

In the pursuit of these objectives, BAR has been coordinating with the DA-National Rice Program and various R&D collaborations were made in 2015 with the national/regional R&D institutions on the implementation of rice R&D projects.

BAR joined the DA Rice Program, PhilRice and IRRI in updating Secretary Proceso J. Alcala on the implementation status and the accomplishments of the DA-IRRI partnership projects as well the agency's thrusts on strategic rice RDE projects on 1 June 2015 at the ATI Board Room, Quezon City.

BAR also spearheaded the conduct of the "Review and Planning Workshop for the 2014 and 2015 Rice RDE Projects" on 1-2 October 2015 at Luxent Hotel, Quezon City that aimed to present and evaluate the results of on-going and completed rice RDE projects, and to discuss and recommend strategic courses of actions for the improvement of project implementation. There were 13 BAR-funded and assisted projects presented and reviewed during the activity.

Other activities attended and participated included: 1) 2015 Rice Program Quarterly Assessment Workshops facilitated by DA-National Rice Program; 2) Workshops for the preparation of the 2016 Budget Proposal; and 3) Launching of the Palayamanan Plus in Lowland Farms Project.

As of 2015 a total of 47 R&D projects were funded under the DA Rice Program, 35 of which are on-going, while 12 are completed.

Rice is the country's major food staple and accounts for 20 percent of food expenditures. It is an economic commodity and plays an important role in the macro-economic. The Department of Agriculture, through its National Rice Program, staff bureaus, attached agencies, and regional field offices are working together to institutionalize strategies to achieve rice self-sufficiency.

The embodiment of research, development and promotion of appropriate technologies in the whole gamut of rice production can be seen as one of the major service interventions in strengthening the production of the country's food staple. Pursuing this goal requires proactive campaign and effective dissemination of information particularly on the results of R&D.





# Corn and Cassava

Corn and cassava are important crops in Philippine agriculture. The abundance and sustainability of these crops will not only benefit humans for food and other industrial needs, but they also serve as main feed ingredients for the livestock and poultry sector.

While improved production is necessary to augment farmers' income, processing needs and development of other by-products derived from these crops must also be established. Engaging R&D in discovering new high yielding varieties, technological innovations, and other production and processing requirements are also imperative.

For this program, BAR continues its partnership with the DA National Corn Program to increase production of quality corn and cassava. Relative to this was the agency's alliance with the DA and its offices, other government agencies and other stakeholders, which in turn produced significant results.



The corn and cassava R&D programs and activities had been intensified in 2015 and took shape through the conduct of the "SSNM-White Corn Dry Season National Review and Planning Workshop" on 17-20 March 2015 at Azalea Residences, Baguio City. The review resulted to on-farm experiments and was used in developing the Nutrient Expert® (NE) Maize OPV and TV. Another activity participated in was the "Corn and Cassava R&D Program and Review Planning Writeshop" on 27-30 October 2015 at the Green Canyon Hotel, CLARK Freezone, Angeles City. One of the major outputs of the activity was the availability of the Nutrient Expert Maize – Philippines, a computer-based tool for developing science-based fertilizer, and is now ready for field testing. After the successful development of NE software for corn (yellow and white), the TWG and DA-RFOs recommended to conduct SSNM-OFT for cassava. BAR also joined the "DA National Agri-Pinoy Corn Program CY 2015" in the review and planning workshop held on 24-28 May 2015 in Puerto Princesa, Palawan.

As of 2015, a total of 128 corn and cassava projects have been funded, 30 are completed, 74 are on-going, and 24 are new.





# Soybean

23 July 2015, at BAR. Students from six SUCs participated in the contest, namely: Bulacan Agricultural State College, Pampanga Agricultural State University, Central Luzon State University (CLSU), Nueva Vizcaya State University (NVSU), University of Rizal System, Quirino State University (QSU), and Tarlac College of Agriculture showcasing their original soybean recipes. Of the six SUCs, three advanced to the final round: QSU, CLSU, and NVSU. QSU bagged the grand price and was awarded during the 11th National Technology Commercialization Forum and Product Exhibition held on 7 August 2015 in SM Megamall, Quezon City.

BAR, in collaboration with DA attached agencies and staff bureaus, DA-RFOs, and SUCs, undertook soybean related initiatives and activities to build a strong and sustainable soybean industry in the Philippines. This collaboration was further strengthened with the crafting of the Philippine Soybean Roadmap for 2010-2016. Since then, the promotion of soybean, through the conduct of trainings, workshops, and soybean food utilization, have gone nationwide.

The agency has also supported several projects on technology promotion of organic soybean seed production and product development and identified major commodity program components.

As of 2015, BAR supported 82 soybean R&D projects, 57 are completed, 19 are on-going, and 6 are new.

BAR conducted the "First Annual Review and Planning Workshop on Soybean R&D Program" on 23-26 March 2015 in Puerto Princesa, Palawan. It also led to the conduct of a soybean cooking contest, dubbed as "It's Soy Time!" Soybean Original Recipe Cooking Contest on





# Rubber

The importance of rubber as an industrial crop and its promising potentials and benefits especially to small rubber holders, has been given preferential attention and recognition by the government. Thus, BAR's partnership with HVCDP, research networks, and other rubber stakeholders resulted to improved rubber production and management protocols through R&D.

BAR supports the technology commercialization of recommended rubber clones in the country, including production and processing technologies in suitable rubber areas nationwide.

For 2015, the bureau provided funding assistance to two new projects being implemented by DA-4B (MIMAROPA) and DA-Zamboanga Peninsula Integrated Agricultural Center (ZAMPIARC). The new projects were on the expansion or the commercialization of rubber in Oriental and Occidental Mindoro and Adoption Trial of Different Rubber clones in Zamboanga.

Since the start of the program, 21 projects have been funded, 15 are completed and 6 are on-going.

The six on-going projects include: 1) Promotion of Commercial Rubber production at UP Laguna-Quezon Land Grant; 2) Phase II- Rubber Development Program for



Southern Mindanao: A support program towards the revival of the Natural Rubber Industry - Phase II; 3) Technology Adoption and Demonstration of Para Rubber (*Hevea brasiliensis*) Intercropped with Indigenous Tree Species and Selected Agricultural Crops; 4) Techno Demo on Rubber Production and Management; 5) Development and Promotion of Rubber Towards Commercialization in Negros Occidental; and 6) Technology Adoption and Performance Trial of Different Rubber Clones in the Philippines.

**BAR supports the technology commercialization of recommended rubber clones in the country, including production and processing technologies in suitable rubber areas nationwide.**







# Adlay

Consistent with the DA's call for food staples self-sufficiency, which aimed to promote the country's traditional crops such as rice, white corn, banana, cassava, and sweet potato, BAR intensified its campaign to promote adlay, an indigenous rice-like crop. Now on its fifth year of implementation, the Adlay R&D Program is now looking into commercialization of the commodity.

One of the important initiatives under the program in 2015 was the conduct of a market research wherein BAR commissioned the University of Asia and the Pacific (UA&P) to lead the initiative. The study aims to come up with a marketing plan for adlay products based on the market research of households and retailers/distributors in the selected sample areas. Such areas include major adlay-producing regions including 2, 4A, 9, and 10 and not-so-familiar areas to adlay including NCR and Region 7. The marketing plan will serve as a guiding tool in pursuing possible commercialization of adlay.

BAR led the conduct of the "2015 Adlay National Review and Planning Workshop" on 28-30

September 2015 in Quezon City. It aimed to review and assess accomplishments on the development and promotion of adlay projects and technologies, discuss project implementation issues, identify priority projects for next year, and finalize plans for commercialization and product promotion.

The adlay marketing plan was crafted in 2015 consisting of the following strategies: 1) create product awareness campaign for adlay; 2) establish volume of production and marketable surplus to ensure supply reliability; 3) promote health benefits of Adlay capitalizing on the increasing health-consciousness in the country to spur consumption; and 4) develop grit size approximating the rice grain and improve smell to increase acceptance; among others.

As of 2015, 183 hectares have been developed for adlay seed production in the provinces of Zamboanga Peninsula. Due to intensive campaigns on adlay production, kaingin farms have also been planted with leguminous crops, corn and adlay under the coconut trees. A total of 17,720 kgs adlay seeds have been produced. Meanwhile, DA-RFO 2 initiated the pilot testing of the adlay milling machine in all the testing sites in Regions 2, 4A, 5, 9, 10, 11, 12, and 13.

Part of BAR's initiative of putting adlay into the mainstream market is through the promotion of its products including the adlay-enriched GOURmix, a product of the CVRC, DA-RFO 2. Other adlay products, which are now ready for commercialization include breakfast cereal, yoghurt, wine with ube, and wine with adsoy.

As of 2015, BAR is coordinating 48 adlay projects, 26 are on-going and 22 are completed. From the 48 adlay projects, 11 are being implemented by SUCs, 37 by PhilMech, and 37 by DA-RFOs.

# Apiculture

Bees have an important role in the agriculture sector, particularly in increasing crop productivity and in sustaining biodiversity. These have beneficial effects on the enhancement of agricultural productivity through pollination as well as in the production of honey and other bee products including honey, propolis, beeswax and pollen, among others.

Considering the potential of bees, BAR, in partnership with the UPLB Bee Program, has included apiculture as one of its major R&D programs.

The bureau also capitalized on the benefits of bees in agriculture and pushed forward its multiple benefits to small-and medium-scale farmers by capacitating them.

To further promote the bee industry, developed technologies need to be extended to selected provinces in the Visayas, and thus, on 16-21 January 2015, a site validation was conducted in DA-RFO 6. DA personnel were briefed and given lectures on bee management to capacitate concerned staff on breeding and product development. As a protocol, apiary sites were inspected for the presence of mites, small hive bee, and diseases, four in Iloilo and three in Bacolod.



BAR, through the Bee Program, transported 37 colonies to Guimaras and eight colonies to Bacolod on 9-13 March 2015. Eight bee farmers were also given lectures cum demonstration on the utilization of bees in pollination to strengthen their capacity in managing native bees, *A. dorsata*, *A. cerana*, and *Tetragonula spp.* for honey, pollen, and propolis production and pollination.

These activities were part of the BAR funded apiculture project on "Expansion of Beekeeping Technologies in support to Organic Agriculture in Visayas and Mindanao" led by Dr. Cleofas R. Cervancia of the UPLB Bee Program. This initiative was in collaboration with selected DA-RFOs and SUCs. The objective of the project was to establish techno-demo apiaries for native bee species.

The project was an offshoot of the initial project on commercialization of beekeeping technologies in various sites in Luzon.

In 2015, 16 projects were being coordinated and funded under the program, 12 completed, 4 on-going, and 4 new.







# Native Animals

Prior to the creation of the Philippine Native Animal Development (PNAD) Program in 2010, BAR has been partnering with the DA's Livestock and Poultry Program in supporting and funding R&D projects on native animals. With the implementation of the PNAD, the bureau continues to support the prime advocacy of the livestock sector, which is to develop programs, projects and activities for the conservation, production, and marketing of native animals.

To strengthen its commitment to the sector, the agency participated in the "TWG and Regional Focal Persons (RFP) Mid-Year Workshop/ Meeting" on 19-22 May 2015 in Puerto Princesa, Palawan. The workshop focused on improving the proposal preparation capability of the focal persons, to set direction among TWG and RFPs in relation to the growing interest of private entrepreneurs.

In 2015, BAR conducted two seminars on "Native Swine Production and Management" on 9 February 2015 at Cebu Technological University, and on 27 June 2015 at the Provincial Auditorium in Laoag City. Another

two seminars on "Organic and Scientific Native Chicken Production" were held on 27-28 April 2015 at the Mariano Marcos State University, and on 6 July 2015 at Misamis Oriental State College of Agriculture and Technology.

Towards the end of the year, the bureau conducted the "Review of Completed and On-Going BAR-Funded Projects on Native Pigs and Planning Workshop" on 7-8 December 2015 at the BAI-National Swine and Poultry Research Development Center, Tiaong, Quezon. A total of 11 projects were reviewed: 3 from DA, 2 from SUCs, 6 from partners outside DA and SUCs. Another significant highlight of the review was the preparation of the inputs to the 2016-2022 R&D Native Animals Directions.

As of 2015, a total of 23 livestock and poultry related projects have been funded, 12 are on-going, 5 are completed, and 6 are new.

One significant accomplishment of the program was the successful conduct of the two BAR-funded and completed projects with the Mulanay Rural Improvement Club. The projects are on: 1) Native Swine for Lechon De Leche Production Project: Improving Feed Availability through Integration of Sakwa as Forage Feed in Coconut-based Production Systems; and 2) Agricultural Systems Approach to the Commercialization of Native Swine in Quezon.

Both projects were successful in maximizing the use of Sakwa or the bulb of Gabing San Fernando, a locally available feeds, for native swine production, which can be given fresh or boiled along with feed concentrates at the finishing stage. These also supported the breeding operation and improved the supply chain system starting from animal feed production, breeding, fattening, marketing, processing and distribution until it reached the end-consumers.



## **R&D Priorities**





Apart from handling the R&D components of the different DA National Banner Programs, priority has also been given to areas that will enable agriculture and fisheries research and development to capacitate its own manpower, strengthen its facilities, and effectively manage its knowledge resource. With this, BAR supports the conduct of basic and strategic researches, as well as research policies and advocacies. The importance of international partnerships, human resources and facilities development, information and communication technology, and knowledge management in advancing the agri-fishery sector is likewise recognized by the bureau.

# Basic and Strategic Researches



BAR continues to support basic and strategic researches that generate and verify information and technologies in the agri-fishery sector, results of which are aimed at improving and sustaining the productivity and profitability of farmers and fisherfolk. In addition to supporting projects under the DA National Banner Programs, BAR facilitates the funding of such researches under the bureau's regular grant funds.

In 2015, BAR facilitated the funding of an on-going basic research project being implemented by the Philippine Center for Postharvest Development and Mechanization (PhilMech). The project aims to study the occurrence and effects of Ochratoxin A that can trigger the formation of fungi in Philippine cacao beans and cacao products.

A big part of the supported projects for the year were on applied researches with 19 projects. These include newly-funded researches involving:

- ✦ physico-chemical characterization of various rootcrop tubers for crops
- ✦ epididymal sperm cryopreservation for indigenous and/or endangered wildlife for livestock development purposes
- ✦ inventory and resource assessment of economically-important mollusk species
- ✦ evaluation of Nile tilapia strains
- ✦ application of sargassum as immunostimulant for aquaculture
- ✦ improvement of seed production and culture techniques for ayungin and biyang puti
- ✦ performance of tikod amo in a polyculture system
- ✦ biodiversity and distribution of the epiphytic and microbenthic seaweed resources
- ✦ food safety such as levels of arsenic and cadmium contaminations in locally-produced rice and NCO database on food and food safety researches



# Policy Research and Advocacy



In an effort to be updated on the latest breakthroughs and innovations in R&D, BAR constantly monitors the recent issues, concerns, and trends in the agriculture and fisheries industry. Furthermore, the bureau drafts concept and technical papers on emerging topics and matters affecting Philippine agriculture. Gathered from the latest and relevant empirical data and statistics, the bureau collects, analyzes, and crafts policy briefs/concept notes and policy recommendations for use of the DA. BAR also commissions impact assessment and socio-economic research projects. Results of these studies contribute to public expenditure prioritization for research in agriculture and fisheries and to improve development programs of the DA.

## ***Impact assessment and focus***

For this year, BAR continuously facilitated and coordinated the implementation of impact assessment projects. "An Assessment of Sustainability of Community-based Participatory Action Research (CPAR) Projects at the Local Government Level" led by the University of the Philippines Public Administration Research and Extension

Services Foundation (UPPAF) was one of these projects that aimed to assess the sustainability of 10 CPAR projects being implemented by the local government units (LGUs) in different areas in Luzon, Visayas, and Mindanao.

Another study, being implemented by UP Los Baños, was the community action research on food self-sufficiency and food security titled, "Collaborative Research, Development and Extension Services for Food Security in Regions 4A, 4B and 5". The project sought to strengthen agricultural extension services through collaborative partnerships among institutions involved in such services, as well as the capacities of partner institutions on food security planning, local policy formulation, and agricultural governance. Currently, the project team is translating the outputs into executive orders so as to institutionalize the recommendations derived from the implementation of the project.

In 2015, BAR also approved the project led by the Center for Environmental Law and Policy Advocacy (CELPA), Inc. that involved impact evaluation of the participation of women in agriculture.



### ***Policy Research and Analysis***

Technical inputs have been provided by BAR on the following House/Senate Bills: 1) An Act Instituting the Philippine Halal Export Development and Promotion Program, Creating for the Purpose the Philippine Halal Export Development and Promotion Board, and for other purposes; and 2) An Act Promoting and Supporting the Competitiveness of the Sugarcane Industry and for other purposes.

Similarly, BAR collaborated with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) for the implementation of the project, "Linking Farmers to the Market: Transforming Subsistence Philippine Agriculture to Commercial Farms," that sought to close the gap between farmers and consumers. The bureau also continued to facilitate the project on economic analysis of climate change adaptation strategies in selected coastal areas being implemented by WorldFish Philippines.

### ***R&D Governance and Quality of Science***

BAR, in 2015, implemented its Strategic Performance Management System (SPMS),

a performance evaluation and appraisal system required by the Civil Service Commission (CSC) for government agencies as basis for performance-based incentives. Prior to implementation of the SPMS, BAR conducted a series of consultations and a workshop among rank and file employees, leading to the crafting of the Office Performance Commitment and Review (OPCR), Division Performance Commitment and Review (DPCR), and Individual Performance Commitment and Review (IPCR). DA-CSC Field Office Director Hans R. Alcantara served as the bureau's resource person in the writing of the documents.

### ***Results-based Planning and Evaluation***

As required by DA offices and agencies, BAR consistently complied with the periodic preparation and submission of plans, accomplishments, and other related documents. These included the Summary of Plan and Budget Proposal, Budget Execution Documents/Agency Performance Measures, Budget Preparation Form 201-B-MOOE, Budget Accountability Reports, Physical Performance Reports, Major R&D Program Portfolio, Budget Hearing Portfolio, Physical and Financial Performance, and Climate Change Expenditures.



# International Partnerships



Realizing the importance of collaboration in implementing R&D programs and activities, BAR maintains existing and forges new partnerships 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.

## ***Iowa State University***

Toward the end of 2015, BAR forged a collaborative partnership with Iowa State University - Seed Science Center and InangLupa Movement for the implementation of "Collaborative R&D Program on Seed Science and Policy, Capacity Building, and Information Communication Technology." The program will work on further strengthening the agriculture sector, particularly in the areas of seed systems and seed policy, information and communications technology, and capacity building activities, among others. In view of the partnership, BAR Director Nicomedes Eleazar, InangLupa Movement President William Dar, and Iowa State University-Seed Science Center Global Program Leader Guntuku Dileepkumar signed a tripartite Memorandum of

Understanding on 16 December 2015 at Luxent Hotel in Quezon City.

## ***Asian Food and Agriculture Cooperation Initiative***

BAR continued the implementation of two AFACI-funded projects in 2015, namely: "Strengthening Plant Genetic Resources (PGR) Management System: Conserving the Diversity of Priority Vegetables (*Solanaceous* Crops) Germplasm of the Philippines" and "Agricultural Technology Information Network (ATIN) in Asia."

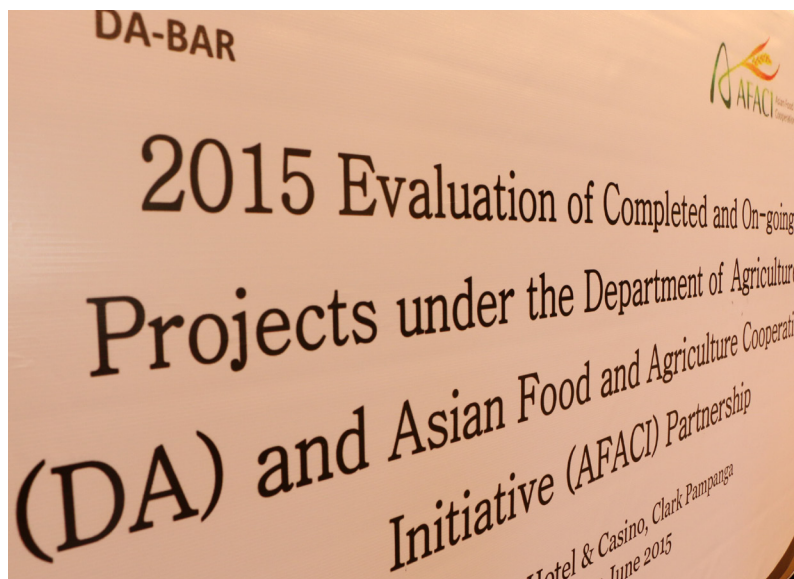
To review and assess the status of the project involving the management of PGR in the Philippines, a consultation meeting and annual planning workshop was held on 9-11 December 2015 in Clark, Pampanga. Focal persons presented their respective project accomplishments while strategic plans for the continuous implementation of PGR management systems in the country were discussed in the planning workshop. Among the plans tackled was the second phase of the project being implemented in partnership with UPLB that focuses on conserving the diversity of *Vigna* species (cowpea, mungbean) and pigeonpea germplasm.

For the ATIN project, BAR participated in the “AFACI Program Workshop on Extension” held on 20-24 October 2015 in Bangkok, Thailand. Attended by principal investigators from Southeast Asia and Central Asia, the event served as a venue to discuss the progress of the ATIN project implementation in each respective member countries. BAR reported on the list of projects that are ready to be published in AFACI’s web-based platform. These included researches on rimas biodiversity, biofertilizers sourced from goat manure, and corn cobs as fertilizers.

Additionally, the conduct of the “2nd Evaluation of Completed and On-Going AFACI Projects” was spearheaded by BAR held on 3-5 June 2015 also in Clark, Pampanga. AFACI National Contact Person Maria Rosario Lourdes Em attended the event and recognized the achievements of the “Most Outstanding” projects: 1) Establishment of Network and Model Manual on Postharvest Technology of Horticultural Crops in Asia by Dr. Perlita Nuevo, and 2) Development of Rice Production Technologies for Increased Self-Sufficiency of Staple Food in Asia by Dr. Victoria Lapitan. Consecutively given recognition were “Outstanding” projects: 1) Asian Network for Sustainable Organic Farming Technology - ANSOFT by Mr. Rodel Carating, and 2) Enhancing Agricultural Mechanization Technologies for Crop Production and Postharvest Processing of Cassava by Dr. Romualdo Martinez.

### ***Biodiversity Conservation***

Part of BAR’s efforts to support agricultural biodiversity conservation is its continued assistance in the coordination of the project, “Partnerships for Biodiversity Conservation: Mainstreaming Biodiversity into Agricultural Landscapes or Biodiversity Partnership Project (BPP),” which was funded by the Global Environment Facility and supported by the United Nations Development Program (UNDP). In 2015, the bureau became involved in the island-wide public consultative meetings for the draft of Biodiversity-Friendly Agricultural Practice Standards and Certification. Apart from consultation workshops and regular DA-Technical Working Group meetings, BAR also took part in the revision of the module for BPP Training of Trainors.







Another internationally-funded project being coordinated by the bureau and implemented in collaboration with UPLB Foundation, Inc. (UPLBFI) and Department of Environment and Natural Resources-Biodiversity Management Bureau (DENR-BMB) is on "Integrating the Conservation of Plant Genetic Resources for Food and Agriculture into Decentralized Landscape Management for Food Security and Biodiversity Conservation in Critical Eco-Regions in the Philippines (ITPGRFA Project)." The initiative was funded by the Benefit Sharing Fund of the International Treaty of Plant Genetic Resources for Food and Agriculture of the Food and Agriculture Organization (FAO) through the UNDP Philippines.



On 6 November 2015, a national presentation and discussions on the draft Strategic Action Plan (SAP) developed by the project was conducted in preparation for finalization and endorsement to the national government. Representatives from various DA units; DENR-BMB; Philippine Root Crop Research and Training Center; Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD); Department of Trade and Industry-Board of Investments; National Anti-Poverty Commission; Southeast Asia Regional Initiatives for Community Empowerment (SEARICE); and Magsasaka at Siyentipiko para sa Pag-unlad ng Agrikultura (MASIPAG) participated in the activity.

The SAP intends to mainstream or integrate biodiversity conservation into the agricultural production system, markets, and other sectors to gain environmental benefits. By initiating in-situ conservation strategies in farmers' fields with biodiversity conservation integrated into the existing production systems, mitigating the loss of target crops such as traditional rice, sweet potato, taro, and yam will be achieved.

With a number of activities still in progress including consultation-workshop with experts on in-situ conservation, validation of protocols in the six project sites, and finalization of the curriculum for the Conservation Field School, the implementers requested that the project be extended until May 2016.

Since the ITPGRFA project is a support to the bigger BPP, BAR continues to coordinate and ensure harmonization of project activities and integration of results.



# Human Resource Development

BAR recognizes the need to continuously enhance the capacities of the National Research and Development System in Agriculture and Fisheries (NaRDSAF) member institutions to increase the amount and quality of trained technical and professional manpower in the sector. Under the Human Resource Development Program, BAR provides financial assistance to members of the NaRDSAF community who are pursuing graduate studies, as well as support to participation in various R&D undertakings held locally and internationally. Under the program, the bureau also assists deserving UPLB undergraduate students of agriculture, agricultural biotechnology, and other related fields.

## Degree Scholarship Program

In 2015, BAR awarded scholarship grants to three employees of NaRDSAF-member institutions pursuing their Master's (MS) and Doctor's (PhD) degrees in agriculture- and fisheries-related fields (*Table 4*). This year, regular employees from NaRDSAF who applied and succeeded in the evaluation of the Degree Scholarship Program received an increased monthly stipend of Php 17,000 for MS and Php 25,000 for PhD, from the previous Php 12,000. With the increase in stipend, BAR hopes to enhance the competitiveness of the bureau's scholarship program and encourage more researchers to earn post-graduate degrees. Since the program's institution in 2000, BAR has produced 99 graduates (49 MS and 50 PhD) coming from DA national and regional agencies, and state universities and colleges.



Table 4. Grantees of the Degree Scholarship Program for 2015

Name	Agency/Institution	Course
1. Jofhiline F. Dygico	Camarines Norte State College	PhD Community Development
2. Rosemarie Q. Joson	DA-Regional Field Office 3	MS Development Communication
3. Nestor A. Blanco	DA-Regional Field Office 1	MS Agronomy



For the DA-BAR-UPLB Undergraduate Scholarship Program, 14 students taking up Bachelor of Science in Agriculture, Agricultural Biotechnology, Development Communication, and Food Technology have been supported (*Table 5*).

Table 5. Grantees of the DA-BAR-UPLB Undergraduate Scholarship Program for 2015

Name	Course
1. Abao, Clarisse Mae N.	BS Development Communication
2. Angeles, Jolly Cire M.	BS Agriculture
3. Caisip, Rafrel E.	BS Agricultural Biotechnology
4. Carles, J. L.	BS Development Communication
5. Heredia, Aurea C.	BS Agricultural Biotechnology
6. Kalaw, Julie Anne T.	BS Agriculture
7. Lara, Patricia Mae A.	BS Food Technology
8. Larazo, Marra Necyrica B.	BS Development Communication
9. Laurel, Niño R.	BS Agriculture
10. Malveda, Rochelle Grace F.	BS Agriculture
11. Ontolan, Kristelle	BS Agricultural Biotechnology
12. Paningbatan, Danielle P.	BS Agriculture
13. Sanico, Keno Pascual Q.	BS Agricultural Biotechnology
14. Temporal, Marleth B.	BS Agricultural Biotechnology

### BAR stages 4th Scholars' Fellowship Night

BAR spearheaded the 4th Scholars' Fellowship Night on 16 April 2015 at EDSA Shangri-La Hotel, Manila to give tribute to the milestones accomplished through the bureau's Degree Scholarship Program. It also served as a venue for interaction and communication between and among the scholars and the stakeholders.

Around 170 participants attended the event, most of whom came from the group of completed and on-going undergraduates, MS, and PhD. The rest were members of the BAR management and staff including other stakeholders.

One of the highlights of the event was the launching of the Directory of BAR Scholars, a consolidation of profiles of all the BAR scholars including those who have completed their degrees and on-going students. The directory also serves as a database for the network of R&D professionals that the program has produced.

Some of the BAR scholars who delivered testimonials during the event are now of high rankings in their respective offices and agencies, either DA officials, SUC presidents, administrators, deans, research directors/managers, and seasoned researchers.

### ***Non-degree Assistance Program***

For the non-degree assistance program, BAR supported the participation of 86 researchers, scientists, key officials, and technical staff who attended conferences, trainings, workshops, and other relevant R&D activities held both locally and abroad. The bureau also provided assistance to the conduct of three thesis/dissertation of employees from the NaRDSA community.

### ***Productivity Enhancement Program***

Serving as the secretariat for the 2015 Gawad Saka Search for Outstanding Agricultural Scientist and Researcher, BAR facilitated the evaluation of 12 nominees for Outstanding Agricultural Scientist and 10 nominees for Outstanding Agricultural Researcher. Following the desk evaluation, extensive field validation, deliberation, and presentation to the Board of Judges (BOJs), Dr. Alan P. Dargantes of the Central Mindanao University (CMU) and Ms. Wilhelmina P. Castañeda of the Department of Agriculture-Regional Field Office (DA-RFO) 1 emerged as this year's Outstanding Agricultural Scientist and Outstanding Agricultural Researcher, respectively.

Dr. Dargantes and Ms. Castañeda each received presidential trophies, citations, cash awards amounting to Php 100,000, and research grants worth Php 2,000,000 during the awarding ceremony held on 9 December 2015 at the Philippine International Convention Center in Pasay, Manila.



Dr. Alan P. Dargantes of WCentral Mindanao University



Ms. Wilhelmina P. Castañeda of DA-RFO 1



## R&D Facilities



The Institutional Development Grant (IDG) of BAR caters to the growing development needs for a more responsive delivery of services and technological interventions in the agri-fishery sector.

In 2015, the bureau facilitated the processing of funding support for 34 IDG projects, 17 of which were funded under AFMA and the remaining 17 were from the DA Banner Programs. The IDG projects supported the establishment and upgrading of laboratories and R&D facilities of NaRDSAF-member institutions (*Figure 3*).

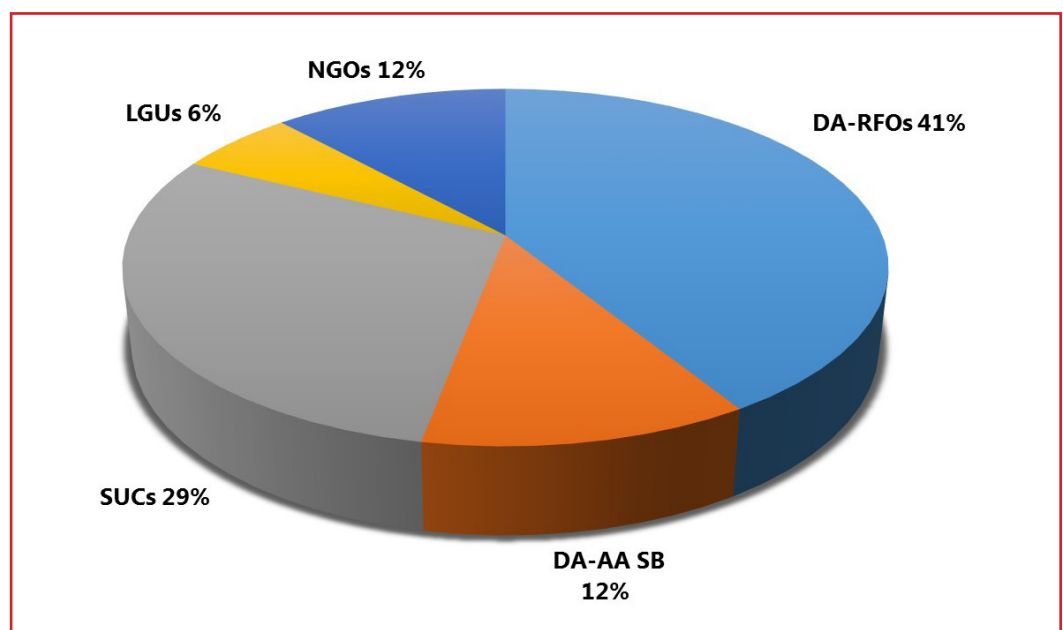


Figure 3. Funded IDG projects for 2015 by institution

In 2015, a number of R&D facilities were inaugurated. Among them was the Apiculture Processing Center for Organic Agriculture of Southern Luzon State University-Tiaong Campus in March. Also included was the inauguration of three facilities in June, namely: Post Harvest Horticulture Training and Research Center and Biofuels Research Laboratory of the University of the Philippines Los Baños together with the Nutraceutical Research Laboratory of Pampanga State Agricultural University.

During the fourth quarter of the year, two R&D centers were also inaugurated. These were the Organic Agriculture R&D Center of the Department of Agriculture-Regional Field Office 10-Northern Mindanao Integrated Agricultural Research Center in October and the Climate Change Center of Central Luzon State University in December.



Inauguration of UPLB's Postharvest Horticulture Training and Research Center



Inauguration of PSAU's Nutraceutical Research Laboratory



# Information and Communication Technology

Harnessing the power of information and communication technology is one of the vehicles used by BAR in bringing agriculture toward progress and development. As such, the bureau invests in telecommunication technologies to ensure that stakeholders are provided with access to knowledge and networks related to R&D.



## **Network Administration**

In 2015, majority of the bureau's network administration tasks involved the configuration and maintenance of ICT-related resources including 139 user accounts, 43 internet and 35 mail users, 142 IP phones, 147 computers, 8 network printers, and 120 Sophos clients. These also included creating back-up for 11 databases and BAR's website, maintaining the biometric machine, and harvesting biometric machine data for database uploading.

For IT support services, different divisions and units were provided assistance during the conduct of meetings, conferences, workshops, and seminars spearheaded and participated in by the bureau. Technical support were also given in resolving IT-related incidents, as

well as in deploying equipment, relocating workstations, reformatting computers, creating IDs, and other troubleshooting activities.

## **Web Development and Maintenance**

As a public reflection of BAR's corporate image, the bureau continuously maintained and updated its website to provide up-to-date information and enhance overall function. Activities undertaken consist of maintaining press and photo releases; uploading of announcements, newsletter issues, and banner photos; and creation of a GAD corner; among many others (*Table 6*).

Table 6. Website Maintenance Activities for 2015

Activity	Indicator	Output
1. Maintained Press Releases	no. of webpages maintained	14
2. Maintained Photo Releases	no. of webpages maintained	59
3. Uploaded Announcements	no. of webpages created	2
4. Uploaded Chronicle Issues	no. of webpages created	113
5. Posted Transparency files	no. of files	28
6. Uploaded banner photos	no. of photos	16
7. Upload photos to the AFACI website	no. of photos	30
8. Creation of a GAD corner	no of webpages	6

Moreover, BAR consistently monitored website usage based on the indicators from Google Analytics. In 2015, almost all of the indicators registered a percentage increase compared from the previous year, except for average session duration, pages per session, and new sessions (visits) (Table 7). This year, the BAR website was also accessed in 228 countries and dependent territories worldwide.

Table 7. Comparison of Website Usage Indicators Between 2014 and 2015

Indicator	Jan-Dec 2015	Jan – Dec 2014	Difference	% change
Sessions (Visits)	419,147	356,670	62,504	17.52 ↑
Users (Unique Visitors)	319,374	278,056	41,318	14.86 ↑
Pageviews	817,300	475,700	71,600	9.60 ↑
Unique Pageviews	643,773	583,643	60,130	10.30 ↑
No. of Downloads	5,678	5654	33	0.58 ↑
Ave. Session Duration	0:02:30	0:02:40	-0:00:10	-6.43 ↓
Pages per Session	1.95	2.09	-0.14	-6.74 ↓
Average Time on Page	0:02:38	0:02:27	0:00:11	7.48 ↑
New Sessions (Visits)	74.67	76.71	-2.04	-2.6 ↓

### ***Systems Development and Maintenance***

Under systems development and maintenance, BAR is working on the development of three information web-based systems. One is the ITPGRFA System that contains information on distribution, abundance, sources of gene pool, appropriate conservation practices, utilization, and market potential of traditional varieties of rice, sweetpotato, yam, and taro.

Another system to be developed is for the Compendium of A&F R&D Projects which will serve as a database of the compendium containing the projects' summary and technology description and its application whereas the BAR Digital Repository System will include information on submitted terminal reports and thesis/dissertations funded by BAR.

### ***Information and Communication Technology Projects***

Three ICT-related projects are being handled by the bureau for the year. These include projects on "Technical Assistance for the Modernization of Agriculture and Fisheries Sector" and "Design, Implementation, Deployment, Testing, and Turn-over of Key ICT Components to Strengthen A&F R&D" which are being closely coordinated with the UP System Information Technology Foundation, Inc. (UPSITF). Another project, "Establishing a Knowledge Management System to Institutionalize at the Central and Local Government Level: A Monitoring and Evaluation System to Assess Program Implementation Activities" is also being managed together with Indra, a consulting and technology multinational company that provides business solutions, IT services, and comprehensive systems.



# Knowledge Management



With the aim of enhancing the flow of information and knowledge exchange between generators and users, BAR produces and packages information, education, and communication materials generated from R&D researches and projects it supports. Likewise, BAR utilizes different forms of media to keep the researchers, extension workers, policymakers, students, and most especially the farmers and fisherfolk posted on the recent innovations in agriculture and fisheries R&D.

## ***Publications***

Recognizing the power of Social Media, BAR started using Facebook (FB) to get wider audience reach and provide new means of increasing the availability of R&D information to clients. Since its creation in June 2015, BAR's FB Page has generated more than a thousand likes. Various technologies, articles, and videos from the bureau's supported R&D projects and activities have also been posted.

This year, a special issue of CPAR Notes was published featuring the effective strategies implemented by CPAR farmers and beneficiaries in their respective projects which were presented during the 1st National CPAR Congress held in February 2014. The first-ever issue of the publication was disseminated during the 2nd National CPAR Congress held in November of this year.

Also under the publication section, the following activities were accomplished: 193 articles written on various topics concerning significant events and promising R&D technologies under BAR's major programs; 47 articles released to media partners published in major dailies and agricultural magazines; 79 R&D projects and activities documented; 30 speeches, messages, and talking points prepared for BAR and DA top-level management; 48 photo releases uploaded and posted in the BAR website and Facebook page; and 30 kinds of publications packaged in the form

of books, magazines, newsletters, brochures, souvenir programs, proceedings, technology calendars, and posters. These IEC materials were disseminated in the bureau's major activities and participation in local and international exhibits.

### **Educational Communication**

Seminars and exhibits form part of BAR's information dissemination efforts. In 2015, the bureau organized and facilitated the conduct of 27 in-house and 12 regional seminars with topics on gender and development, climate change, edible landscaping, beekeeping, SNAP hydroponics, and organic agriculture, among many others. In the same way, BAR participated in 2 international and 4 local exhibitions wherein the bureau featured its two banner programs, Community-based Participatory Action Research and National Technology Commercialization Program, together with other major R&D programs. During the conduct of such R&D

undertakings, technologies generated from supported projects were promoted through the distribution of 118,267 copies of IEC materials among walk-in clients, booth visitors, national and regional partners, and other stakeholders.

Apart from seminars and exhibits, the bureau also co-produced segments for PTV 4's Mag-Agri Tayo TV Program featuring at least 12 BAR-funded projects and 4 BAR major events including BAR Scholars' Night, National Technology Forum, National Research Symposium, and CPAR Congress.

Also under educational communication is the Scientific Publication Grant (SPG), a grant awarded to institutions, organizations, and scientific/professional societies to support the conduct of conferences and symposia, printing of proceedings, publication of books, and other relevant R&D activities. For this year, BAR is coordinating 48 projects under SPG (*Figure 4*).

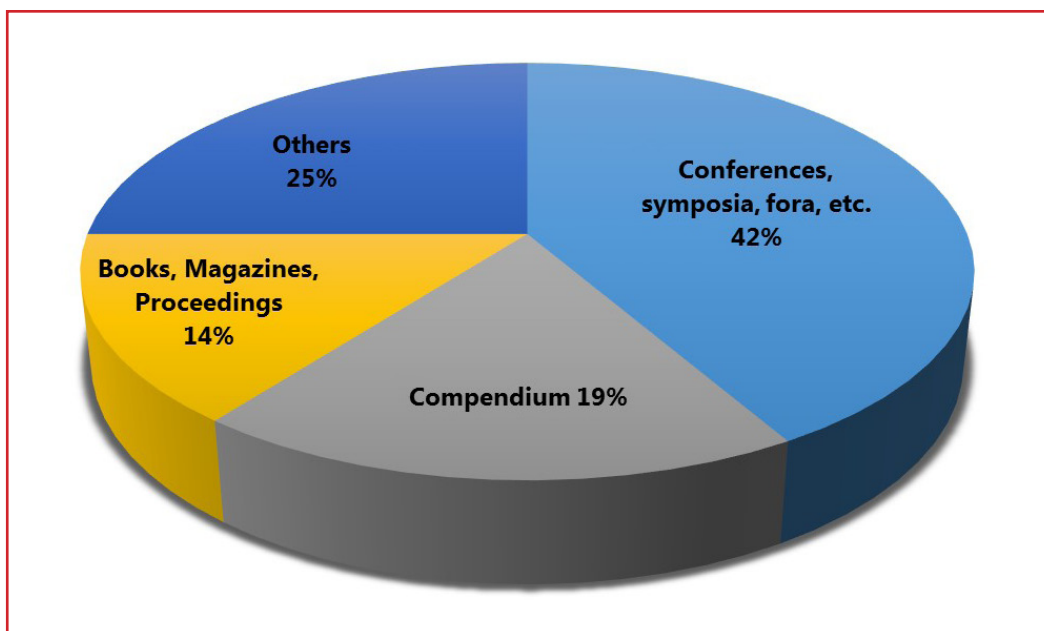


Figure 4. Funded SPG projects for 2015 by activity





Part of the bureau's continuous efforts in strengthening its KM is the conduct of two workshops in partnership with the Southeast Asian Regional Center for Agriculture (SEARCA). Attended by information officers and technical staff members from BAR; DA-Regional Field Offices, attached agencies, and staff bureaus; and Bureau of Fisheries and Aquatic Resources-Regional Offices, the activities highlighted KM tools and techniques, and best practices on social media use and e-learning platforms.

In 2015, 10 production guides called *Techno Digest* which were funded under SPG in the previous year, were launched. Found in the publication are information on recommended production and management technologies for growing selected agricultural crops, livestock and poultry, and fisheries. Among them were native goat, native chicken, native pig, garlic, banana, freshwater prawn, seaweeds, abalone, sampinit, and pineapple. The initiative was made possible in collaboration with researchers from the University of the Philippines Diliman.

### *Compendium of A&F R&D Projects*

Seeing the need to fill in its stakeholders of what has been done by R&D to improve the agri-fishery sector, the bureau started working on "A Decade of Success: A Compendium of Agriculture and Fisheries R&D Projects Supported by BAR from 2005 to 2014." The project is a consolidation of BAR-supported R&D projects that serves as a vital reference for farmers, fisherfolk, research institutions, SUCs, entrepreneurs, and other interested parties on R&D's accomplishments for the last 10 years. The project is expected to be completed by 2016.







# Client-oriented Services



R&D initiatives can further lead to responsiveness as BAR extends its services to clients and stakeholders. Achieved through its R&D Technology Commercialization Center, Scientific Literature Services, and Intellectual Property Support, the bureau's effectiveness is maximized as information is shared with businessmen and women, university students and researchers, visiting farmers, or even just the regular product consumer. Through the many people who have been provided with these services, BAR enlarges its network making itself more accessible to everyone.

# R&D Technology Commercialization Center

Years of productive research has blessed the R&D Technology Commercialization Center (Tech Com) with fresh new products to display at the ground floor of the RDMIC Bldg since its establishment in 2009. This impressive corner inside BAR's building has been a functioning hub for visitors looking to acquire further knowledge on innovative products including the latest information and technologies generated from agriculture and fisheries R&D.

For the year 2015, The R&D Tech Com Center received 574 visitors from different agencies and institutions (*Table 8*). It was during the later part of 2015 that officials and representatives from the Korean International Coopertaion Agency and the Afghanistan Ministry of Agriculture paid the center a visit where they were very interested on the technologies that were on display.

Working closely with the Tech Com Center is BAR's Information Desk of which accommodated 1,622 visitors this year (*Table 9*).

These visitors were usually students, private individuals and staff members of various agencies and organizations. They would come to visit the bureau express their concerns on particular programs and services; inquire of the status on submitted proposals; confirm the schedules of different BAR events such as exhibits and seminars; ask about job vacancies; show up for job interviews; or present proposals in behalf of different suppliers.

Table 9. Number of visitors accommodated by the BAR Info Desk for 2015.

Designation	Number
staff of various DA agencies	142
private individual/farmer	360
sales agent	596
researcher/professor	10
student	204
government agencies/LGUs/ outside DA family	244
BAR job applicants	244
<b>Total</b>	<b>1622</b>



Table 8. Number of visitors accommodated by the R&D TechComm Center for 2015.

No. of visitors	Jan	Feb	Mar	Apr	May	Jun
	41	121	37	28	11	7
Total	Jul	Aug	Sep	Oct	Nov	Dec
574	84	112	62	26	45	0

When visitors visit the Tech Com Center, they are usually curious about the look of the products that came about as a result of the research they have been reading about in papers. Through the availability of different IEC materials at the center, they are able to learn more about the background as to how such products came to be and where they can acquire and purchase them. Some visit the center to explore marketing opportunities as aspiring entrepreneurs hoping to sell the products in their own communities.

The products being displayed at the Tech Com Center were also featured during exhibits such as the National Technology Forum and AgriLink. It is here that the center reaches a wider audience and generates a higher level of inquiry.

Tech Com's personnel is also responsible for connecting the center's visitors to the contact persons of any specific products and projects. Whether it be a focal person of BAR or a university researcher in Los Banos, the Tech Com Center serves to connect one to the bigger network of Philippine R&D so that they access timely and relevant R&D information, products, and services.



# Scientific Literature Services



In this digital age, BAR recognizes the importance of easy access especially for those conducting research. By partnering with the University of Los Banos, the bureau came up with the Philippine Agricultural and Information Network (PhilAgriNet) as part of its Scientific Literature Services. Over the past year, PhilAgrinet has benefited students, farmers, researchers, and employees who are conducting research by giving them access to R&D results without going to the library.

Through PhilAgrinet, researchers can determine the availability of various literature inside the BAR library, such as articles, monographs, serials, and research papers. PhilAgrinet has helped give finished theses and dissertations an online presence by displaying basic publication information and abstracts for online guests to view for free.

Aside from PhilAgrinet, the Scientific Literature Services Section of ACD was also able to gather 1,340 agricultural news clippings, monitor 47 BAR news-related articles, pack and mail 34,054 BAR publications, and assist 169 walk-in clients and library visitors.



As the leader for innovation in the R&D sector, it is the bureau's responsibility to foster an environment that encourages its recipients towards more research and greater development. One of the key factors to achieving this is through Intellectual Property Management.

Intellectual Property is one of the foundations to every business enterprise. With BAR being highly involved in supporting research geared towards the creation of products and services that can penetrate both local and international markets, its Intellectual Property Rights Office (IPRO), which is under TCD, continues to assist its clients in their IP applications such as trademark, patent, and utility model. IPRO is also responsible for identifying patentable inventions, technologies, processes, products of completed and ongoing projects and new proposals from PMED and PPDD.

IPR Certificates were awarded to R&D partners and other private entities that requested for IP assistance at BAR through its Intellectual Property Office. Trademark applications were awarded to: 1) University of the Philippines Los Baños (UPLB) for "Edible Landscaping"; 2) Dr. Bonifacio Comandante Jr. for "IGLAP" Logo and Device; 3) Mr. Michael Melendres for "Earthman" and "Organic Options"; and 4) Dr. Edie Chua from La Trinidad, Benguet for "fmSTATION" logo "Edie Chua" and "M.D., Diabetes Specialist" for the nameplates. They were awarded the certificates during the 2015 NTF.

## Intellectual Property Support



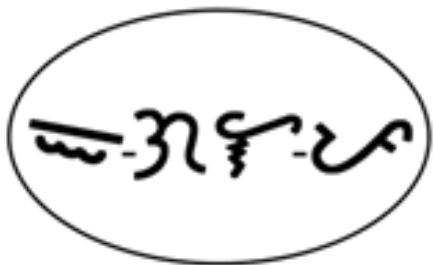
### Edible Landscaping Logo and Device

Blue background and yellow font signify water and sunlight, respectively, the essentials for plant growth. Green represents plants. Spoon and fork symbolize edible plants. Vegetables at the upper right corner signify different crops such as fruit, leaf, root; as well as elements and principles of designs in landscaping including colors, forms, contrasts, textures, harmony.

Agency/Contact Person:

***Dr. Fernando C. Sanchez, Jr.***

University of the Philippines Los Baños



IGLAP

Iglap is a Filipino word for sudden leap, tradename and logo of different agriculture and fisheries product lines and services. The script is the Baibayin way of writing Iglap.

Agency/Contact Person:  
**Dr. Bonifacio Comandante Jr.,**  
Lucban, Laguna

## OrganicOptions

Tradename and logo of their organic agricultural products, including services for teaching the production of these products the organic way. The owner is successful in penetrating the SM Group of companies and the support of international organizations.

The wordmark or brand OrganicOptions is a single word mark without a space between "c" in Organic and "O" in Options. Both O in Organic and Options are in capital letters.

Agency/Contact Person:  
**Mr. Michael Melendres**  
Maguey Rd. Sitio Fatima Village  
Brgy. San Luis, Antipolo City

## Earthman

The word Earthman is a single word mark used also as a logo of products and services. It is not inclusive of any font or size of the mark, nor is it enclosed in any textbox.

Agency/Contact Person:  
**Mr. Michael Melendres**  
Maguey Rd. Sitio Fatima Village  
Brgy. San Luis, Antipolo City



## fm STATION

The logo is fmSTATION, with the word "fm" written on top-center of STATION, font is bold small letters Monotype Corsiva. STATION is all capital letters in Bodoni MT Black font. This logo is used for processed agricultural products like fruits, vegetables, and herbs.

Agency/Contact Person:  
**Edie Chua**

## Edie Chua, M.D. *Diabetes Specialist*

The nameplate uses the applicant's real name and profession, with product lines related to the profession and services. Products include special agricultural products and services for addressing diabetes.

Agency/Contact Person:  
**Edie Chua**

Aside from those awarded during the NTF, the following Trademarks were also awarded to their respective recipients in over the course of 2015.

The logo for Hydroots is written in a stylized, cursive font. The letters are green with a light blue outline, giving it a fresh, aquatic feel.

Tradename and logo of a technology using powdered composition that when dissolved in water is used favorably in maintaining the growth of plants. The owner is currently using it for ornamentals sold in fancy, artistically-designed vases.

Agency/Contact Person:  
**Mr. Robert Sto. Domingo**  
L6-B6 Greenland St., Greenview Village  
Fairview, Quezon City



Tradename and logo of a technology, the "A" mark represents the functions and significance of PHTRC and the horticultural products the agency work on, the place where it is located and with colors representing the colors of the university.

Agency/Contact Person:  
**Postharvest Horticulture Training and Research Center (PHTRC)**  
UPLB, College, Laguna

## PHTRC Hot-Water Tank

Tradename and logo of a hot-water tank designed and manufactured, with the corresponding technology for disinfecting fresh fruits and vegetables most specially mangoes. This technology is required for the Philippine mangoes to enter the export market.

Agency/Contact Person:  
**PHTRC-Plants and Seed  
Systems Division**  
UPLB, College, Laguna



The logo is EE written in white against a blue background, enclosed in rectangular white and blue margins. This represents a systems device in information technology.

Agency/Contact Person:  
**Rachel Anne C. Tolentino**  
Concepcion Uno, Marikina

## Easy Encoder

The name Easy Encoder is applied just as that name, regardless of color and font.

Agency/Contact Person:  
**Rachel Anne C. Tolentino**  
Concepcion Uno, Marikina



This is the logo of the producer of the product with the same name. The mountain in 3D represents agricultural produce, with a sun at the background. An inflorescence of the millet or barley is placed at the side of "Santiago" to emphasize the component of the product

Agency/Contact Person:  
**James G. Gatlabayan**  
San Isidro, Antipolo City



# Awarding of IPR



IPR Certificates were awarded to R&D partners and other private entities that requested for IP assistance at BAR through its Intellectual Property Office (IPRO). Trademark application was awarded to Mr. Michael Melendres for *Earthman and Organic Options* (top photo); University of the Philippines Los Baños for *Edible Landscaping* (middle photo); Dr. Edie Chua from La Trinidad, Benguet for *Edie Chua M.D. and Diabetes Specialist*"; and Dr. Bonifacio Comandante Jr. for *IGLAP logo and device*, as received by Dr. Andrea Agillon of BAR-IPRO (third photo).





# MAJOR EVENTS





## International Events

Research and development (R&D) is never stagnant. It continues to innovate and be responsive to the needs of the sector. It is always in consonance with the challenges of the time and is therefore critical in all innovation process.

In the agriculture and fishery arena, R&D is crucial in bringing development through the generation of important technologies that will bring forth both productivity and profitability to intended beneficiaries.

In 2015, BAR took on an important task of tapping R&D to its full potential in bringing change to agriculture and fishery sector through the conduct of two monumental R&D-driven initiatives: 1) "Philippine International Biomass Conference" on 16-18 June 2015 at Widus, Clark, Pampanga; and 2) "Symposium/Workshop on Planning a Collaborative Research, Development and Extension (RDE) Program on Climate Change among APEC Member Economies" on 16-17 September 2015 at The Peninsula Manila, Makati City.

The "Philippine International Biomass Conference" is a first-ever international event specifically on biomass that gathered together major bioenergy players and investors both from the global and local scenes. It served as a venue for information sharing on the recent status and market potentials of biomass in the country; and for presenting innovative technologies that are commercially-competitive and financially-sustainable.

Meanwhile, the "Symposium/Workshop on Planning a Collaborative RDE Program on Climate Change among APEC Member Economies" was held in response to a call to have a unified and collective RDE effort among the APEC-member economies to address the challenges brought upon by climate change. The event aimed to look at possible collaborative RDE works among member economies on the development of climate change-resilient agriculture through sharing of information and identifying common priorities and strategies that these countries can collectively work on.

***In 2015, BAR took on an important task of tapping R&D to its full potential in bringing change to agriculture and fishery sector through the conduct of two monumental R&D-driven initiatives: the "Philippine International Biomass Conference" and the "Symposium/Workshop on Planning a Collaborative Research, Development and Extension (RDE) Program on Climate Change among APEC Member Economies"***



## 1<sup>st</sup> Philippine International Biomass Conference

With the theme, “Exploring the Market Potentials of Biomass for Bio-Based Fuels and Energy,” the conference was organized by the University of the Philippines Los Baños (UPLB) and the Bureau of Agricultural Research (BAR) in collaboration with the Department of Energy (DOE) and the Department of Environment and Natural Resources (DENR).

Present during the event was Department Agriculture (DA) Assistant Secretary for Regulations Paz Benavidez II who presented the “Status and Potential of Agricultural Residues in the Philippines”. She reiterated the need for business, government and consumers to come together and contribute to ambitious climate action that would have to include the massive shift from fossil fuels to green energy, including biomass energy.

Asec. Benavidez II cited five reasons why biomass is a good alternative for biofuels: 1) reduces dependence on fuel oil, 2) renewable, 3) no emission of greenhouse gas and other

pollutants, 4) improves rural income and employment by putting waste into good use, and 5) reduces foreign exchange outflows.

Her presentation showed that coconut has the greatest potentials in producing power from biomass residues. According to her, from the 2013 coconut production of 15.35 million MT, recoverable biomass was estimated at 2.3 million MT shells and 5.07 million MT husks with Davao region and Northern Mindanao as the highest producer of shells and husks, respectively.

University of the Philippines Los Baños Chancellor Fernando C. Sanchez, Jr. presented the initiative of UPLB on biomass research and development, most of which are being supported by BAR specifically its commercialization. He mentioned the role of the UPLB in strengthening linkages among the academe, government agencies, industries, and private sector through interdisciplinary exchange of information on biofuels.





Other invited speakers from different countries were: Dr. Jon Bennett, vice-president for Business Development for SDL Citadel, LLC (USA); Mr. Ryuichi Ikeda, sales division chief for SOL Asia Holdings (Japan); Mr. Hoong Chee Kean, business development manager for ABENGOA (Spain); and Dr. Anjan Ray, regional commercial director for Honeywell UOP (Canada). They presented their respective technologies and competitive business model in the production of power and fuels using biomass and municipal solid waste.

Other conference speakers present were: Dr. Bernardo D. Tadeo, president and CEO of Full Advantage Phils. International, Inc; Ms. Belly C. Cabeso, technical staff, Department of Energy and Natural Resources-Solid Waste Management Division; Mr. Archimedes B. Amarra, executive vice president for Agro-Industrial R&D and Farm Operations of Roxas

Holdings, Inc.; Dr. William D. Dar, president of InangLupa Movement; Mr. Dexter S. Pajarillo, investment specialist from the Resource-based Industry Services of the Department of Trade and Industry-Board of Investments (DTI-BOI); and Ms. Anita C. Salayon, senior assistant vice president of the Development Bank of the Philippines; Mr. Joseph B. Lledo, vice president of BDO Unibank, Inc.; and Ms. Josefina A. Ramos, environmental officer/program manager of the Environmental Program and Management Department of the Land Bank of the Philippines.

The second day of the conference closed with a market matching activity to foster linkages and agreements among the participants. Culminating the event was the field visit at San Jose City I Power Corporation on the third day to exhibit an actual power plant using biomass as feedstock.







## Symposium/Workshop on Planning a Collaborative RDE Program on Climate Change among APEC Member Economies

The activity was held to develop a joint RDE agenda on climate change adaptation and mitigation among member economies including Chile, China, Indonesia, Malaysia, Philippines, Thailand, United States of America, and Vietnam.

It was organized and led by Department of Agriculture-System Wide Climate Change Office (DA-SWCCO) and the DA-Bureau of Agricultural Research (DA-BAR) in collaboration with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), and the Consultative Group for International Agricultural Research (CGIAR) through its Climate Change, Agriculture and Food Security (CCAFS) program.

The activity paved way to the sharing of information on technologies and strategies on climate change adaptation and mitigation; and

identify the RDE gaps, common priorities, and enabling mechanisms to implement the RDE agenda among APEC member economies.

All the economies presented their respective initiatives to address the impacts of climate change. Their presentations contained the priority concerns and current technologies/strategies for climate change adaptation and mitigation for the agriculture sector, existing institutional platforms/framework, and RDE gaps, limitations and other issues.

In attendance was Dr. Segfredo R. Serrano, agriculture undersecretary for Policy and Planning, and Asia Pacific Economic Cooperation (APEC) -Agricultural Technical Cooperation Working Group (ATCWG) focal point. In his message, he cited the importance of RDE in providing clearance to a lot of risks that turned into uncertainties. "Our duty is





to provide more clarity through research, studies, and technological innovations to reconvert those uncertainties into calculable risks," he said.

Also present was BAR Director Nicomedes P. Eleazar who gave the overview, objectives, expected output and mechanics of the workshop.

Other plenary speakers were Dr. Dindo Campilan, director for Asia of the International Center for Tropical Agriculture (CIAT), who talked about the climate change and agriculture and food security program of CGIAR; and Dr. Bessie Burgos, program head for research and development of SEARCA, who presented SEARCA's umbrella program on climate change adaptation and mitigation.

The second day included interactive group session among APEC economies to come up with common RDE concerns and research agenda, and action plan and enabling mechanisms for collaborations. The outputs were presented in the plenary.

The output of the symposium/workshop was presented by Dr. Teodoro S. Solsoloy, BAR assistant director in the 19<sup>th</sup> ATCWG Meeting that was held on September 28, 2015 at the Iloilo Convention Center, Iloilo City.

BAR, as the focal R&D agency for the Climate Change Program of the Department of Agriculture and the APEC-ATCWG Project Overseer in the Philippines, as represented by BAR Asst. Director Solsoloy, presented common and specific adaptive capacity measures among seven invited economies which included water conservation, revised cropping calendar/agriculture rainfall index, and planting climate-tolerant varieties. Dr. Solsoloy also presented adaptive capacity with mitigation measures, gaps and limitations, and overarching RDE interests.

The 19<sup>th</sup> ATCWG Meeting was one of the five meetings scheduled during the Food Security Week (Sept 27-Oct 1, 2015). Other APEC meetings scheduled were on Public-Private Partnership in fishery and livestock supply chain, high level policy dialogue on agricultural biotechnology, policy partnership on food security, and high level policy dialogue on food security and blue economy.

The ATCWG, composed of government officials and experts from the academe, aims to enhance agriculture's contribution to the region's economic growth and social well-being by promoting agricultural technical cooperation among APEC member economies. One of its strategies is on enhancing agriculture's ability to adjust and mitigate the impact of climate change.









# Annual Events

## 11<sup>th</sup> Agriculture and Fisheries Technology Forum and Product Exhibition



With the theme, “Teknolohiyang Pangsakahan at Pangisdaan: Tulay sa Mas Maunlad na Pilipinas Patungo sa Pandaigdigang Kakayanan”, BAR set the stage for this year’s 11<sup>th</sup> Agriculture and Fisheries Technology Forum and Product Exhibition (NTF) on 7-9 August 2015 at SM Megatrade Hall 2 in Mandaluyong City with focus on showing to the world the global competence of Philippine products and technologies generated by R&D. Research breakthroughs were highlighted and new perspectives on technology commercialization were also presented.

Eleven years of the NTF has shown that farmers and fishers and other stakeholders in the rural communities can become researchers and innovators who continue to find ways and the knowledge to ensure competitiveness and viability of agri-fishery R&D products. They have come to recognize the potentials of commercializing agri-fishery commodities developed through research and realize that they themselves have the capacity to, themselves, become entrepreneurs. The NTF has also provided the means to open up

new areas of entrepreneurial opportunities for its beneficiaries.

In the opening program, Senator Cynthia Villar, chairperson of the Senate Committee on Agriculture and Food, served as the keynote speaker. Agriculture Secretary Proceso J. Alcala and Inang Lupa Movement, Inc. President, Dr. William D. Dar gave inspirational messages. In the day’s activities, they were joined in by IRRI Deputy Director General, Dr. Bruce J. Tolentino and BAR officials led by BAR Director, Dr. Nicomedes. P. Eleazar, BAR Asst. Dir., Dr. Teodoro S. Solsoloy, and BAR-TCD Head, Anthony B. Obligado.

The three-day event was in line with the activities and program thrusts of the National Technology Commercialization Program (NTCP), a banner program of BAR. Over 90 exhibitors from DA staff bureaus and attached agencies, Regional Field Offices (RFOs), Bureau of Fisheries and Aquatic Resources Regional Offices (BFAR-ROs), state universities and colleges (SUCs), international partner-institutions, R&D institutions, private sector, and other R&D stakeholders participated.



Among the highlights of the event were the launching of three books, namely: 1) The Philippine Biofuels Industry, 2) Mineral Profile of Forages and Its Influence on Goat Nutrition, and 3) Pests and Diseases of Economically Important Crops in the Philippines, that were funded under BAR's Scientific Publication Grants (SPG). Also launched was the 2015 BAR Primer, an audio-visual presentation of the bureau's vision, mission and mandate as the country's national agricultural R&D coordinating agency. This year's central display setting drew attention to the coordination of the DA's R&D program by BAR and showcased technology results that have yielded positive economic results.

In Days 1 and 2 of the NTF, BAR sponsored a series of seminars on projects that have great potential for creating rural and community livelihoods, and lectures on topics relevant to entrepreneurship development (Table 10).

Recognizing the importance of the partnerships and roles of BAR with international research agencies as well as local research institutions, the first day of the seminar series was devoted to presentations by experts on various topics including IRRI on heirloom rice, WorldFish Center on climate change adaptation strategies in coastal areas, and Kansas State University on biomass technologies. Also included were cooking demonstrations on preparing Nipa palm sugar and chevon dishes.





Table 10. Seminar topics and product demonstrations during 2015 NTF

Topic	Resource Speaker(s)
Heirloom: Philippine DA Partnership FSSP	Dr. Digna Manzanilla International Rice Research Institute
Economic Analysis of Climate Change Adaptation Strategies in Selected Coastal Areas in the Philippines	Mr. Paul Joseph Ramirez WorldFish
Biomass Technologies	Dr. Praveen Venkata Vadlani Kansas State University
Apitherapy: Therapeutic Application of Formulated Bee Products as Antimicrobial and Wound Healing Enhancing Agent	Dr. Amelita Estacio, DVM UPLB – Institute of Veterinary Medicine
Market linkages with Supermarkets and Retail Chains	Mr. Michael Melendres Melendres Farm Organic Produce
Extending Storage Life of Horticultural Crops	Ms. Leonisa Artes UPLB-PHTRC, Crop Science Cluster
Nipa Palm Sugar Cooking Demo	Mr. John Largo, SIWA Mr. Fritz Escudero, FREEDOM Lanuza, Surigao del Sur
Chevon Cooking Demo	Ms. Marlyn Lilagan Mr. Conrado Agustin Balugao LGU, Pangasinan



Another highlight was the “It’s Soy Time”, a soybean cooking contest participated in by students from 27 SUCs who highlighted their culinary competencies while promoting the utilization and consumption of soybean. first place was won by students from Quirino State University with their “Soya Nuggets”. Central Luzon State University got the second place while Nueva Vizcaya State University got third place for their “Soybean Enchiladas” and Highland Veggie Soya Roll with ‘Squarot’ Creamy Sauce”, respectively.



Another feature of this year’s NTF was the staging of the “Region’s Got Talent, Season 2” that showcased the dance talents of the DA RFOs with BAR presenting its own choreography. First prize was won by the Luzon Cluster while the Mindanao and Visayas clusters bagged second and third prizes.

For the Most Innovative Product award, a main feature of the NTF to encourage product exhibitors, first prize went to the *Nipa Palm Sugar* of the Foundation of Rural Enterprises and Ecology Development in Mindanao (FREEDOM), an NGO. Second prize was taken by *coffee body scrub* of the Green Rescue Organic, another NGO, while the third prize went to *batuan powder/concentrate* of DA-RFO 5.

For the Best Booth competition among DA-RFOs and BFAR RFOs, the winner was the Department of Agriculture and Fisheries of the Autonomous Region of Muslim Mindanao (DAF-ARMM), followed by DA-RFO 4b and DA-RFO 4a with second and third prizes, respectively.

As in the previous year, intellectual property (IP) certifications from the Intellectual Property Office (IPO) were distributed to BAR's partners who had requested BAR for assistance on IP concerns. Certificates as to Trademarks were given to Mr. Michael Melendres for his "Earthman" and "Organic Options"; UPLB for "Edible Landscaping"; and Dr. Edie Chua for "Edie Chua, M.D., Diabetes Specialist". A certificate from IPO was also given to Dr. Bonifacio Comandante, Jr. for his IGLAP Logo and Device.





# Annual Events

## 27<sup>th</sup> National Research Symposium



First staged in 1988, the National Research Symposium (NRS) has been faithfully held each year by BAR to highlight significant research results and technologies generated by researchers and scientists in the fields of agriculture and fisheries. The NRS is an event wherein top scientists and researchers from various state colleges and universities and premier research institutions gather to present the most promising recent researches and technologies developed and generated. Awards are given to exceptional works of researchers that have resulted to new technologies, information, processes, and systems beneficial to agriculture and fisheries.

Through the years, the NRS has also served as a venue to disseminate new technologies and knowledge that support agriculture and fisheries modernization. In 2012, during the 24<sup>th</sup> NRS, in recognition of BAR's contribution to the DA's goal of attaining

food security, Agriculture Secretary Proceso J. Alcala declared the NRS as "an effective platform wherein new research and technologies are properly recognized and tapped for their potentials to become key factors for a more productive agriculture sector".

For the 27<sup>th</sup> NRS held on 14 October 2015 at the Sulo Riviera Hotel in Quezon City, BAR chose the theme, "Climate Resilient R&D towards a Globally Competent and Competitive Agriculture and Fisheries", to reflect R&D's role in providing clarity and solutions amidst uncertainties arising from climate change. As explained by DA Undersecretary Segfredo R. Serrano (in remarks he made in an earlier forum on the APEC response to climate change), answers can be provided by research and technological innovations as these can "reconvert those uncertainties into calculable risks".

This year's number of paper qualifiers is the highest in the history of the NRS with 111 entries submitted to BAR by various agricultural research institutions in the country. From among these, 48 winning papers qualified for the competition and 22 made it as finalists. Five gold, 9 silver and 8 bronze awards were given. The winners were selected under eight categories. These are: 1) basic research, 2) applied research -technology/ information generation in agriculture, 3) applied research - technology/ information generation in fisheries, 4) applied research - technology adaptation/ verification in agriculture, 5) applied research - technology adaptation/ verification fisheries), 6) socio-economics research, 7) development research in agriculture, and 8) development research in fisheries. The finalists were asked to submit poster presentations, the best of which were also given awards (Table 11).

The major awards and cash prizes given out were:

<b>A.</b>	<b>AFMA Best R&amp;D Paper Awards (per category)</b>	
	Gold	P100,000.00
	Silver	75,000.00
	Bronze	50,000.00
	Consolation	10,000.00
<b>B.</b>	<b>AFMA R&amp;D Paper Qualifiers</b>	
	(papers garnering a score of 80% and above)	10,000.00
<b>C.</b>	<b>AFMA Best R&amp;D Poster Awards</b>	
	Gold	50,000.00
	Silver	35,000.00
	Bronze	25,000.00

The Awarding Ceremony was held on 15 October 2015 also at the Sulo Riviera Hotel. It was attended by DA Secretary Proceso J. Alcala and DA Undersecretary Segfredo R. Serrano who delivered the keynote address and inspirational message, respectively. Awarding of AFMA Best R&D Papers and Best Poster Winners

Special Citations/Awards were given to the finalists for the Gawad Saka Search for Outstanding Agricultural Scientist and Outstanding Agricultural Researcher. The 10 *Techno Digest* were also launched during the awarding program.



Table 11. Winners of the 27th NRS

	TITLE	AUTHORS	AGENCY
<b>A. BASIC</b>			
<b>SILVER</b>	Analysis of Deep Root System Development, Soil Water Uptake and Dry Matter Production of Rice Under Upland Drought Condition	Roel R. Suralta Nonawin B. Lucob Arlene B. Aguelo Jonathan M. Niones Maria Corazon N. Julaton Democrito B. Rebong II	Philippine Rice Research Institute
<b>B. APPLIED RESEARCH TG/IG - FISHERIES</b>			
<b>GOLD</b>	Novel genomic Resources for Sandfish <i>Holothuriascabra</i> : Discovery of Putative SNP Markers and Unique Transcripts Associated with Fast-Growth Juveniles using Whole-Transcriptome Sequencing	Rachel June Ravago-Gotanco Gihanna Gaye ST. Galindez June Feliciano F. Ordonez	University of the Philippines-Marine Science Institute
<b>SILVER</b>	Antioxidative and Antimelanogenic Activities of Cultured Oyster Mushroom, <i>Pleurotus ostreatus</i>	Angel B. Encarnacion Ma. Visitation G. Llanto	Bureau of Fisheries and Aquatic Resources-Region 2
<b>BRONZE</b>	Stock Assessment of Christian Crabs ( <i>Charybdis feriata</i> , Linnaeus, 1758) in San Miguel Bay	Plutomeo M. Nieves Nelson R. Olfindo Aldrin Mel Macali	Bicol University- Tabaco Campus and Camarines Norte State College
<b>C. APPLIED RESEARCH TG/IG - AGRICULTURE</b>			
<b>GOLD</b>	Fluidized Bed Drying System for Complete Drying of Paddy Phase II - Development of Fully-Automated Pilot-Scale System	Reagan J. Pontawe Nestor T. Asuncion Roselyn B. Villacorte Romualdo C. Martinez Rex L. Bingabing	Philippine Center for Postharvest Development and Mechanization
<b>SILVER</b>	Toxigenic Potential of Fungal Species from Coffee Beans in the Philippines	Dionisio G. Alvindia Monica F. De Guzman Miriam A. Acda	Philippine Center for Postharvest Development and Mechanization
<b>BRONZE</b>	Survey, Strain Identification and Management of Huanglongbing (HLB) Disease of Citrus in the Philippines	Juliet M. Ochasan Nancy T. Aspuria Ma. Arlene F. Celo Rogelio Custodio Matilde Q. Gumtang	Bureau of Plant Industry-Bagui National Crop Research and Development Center

Table 11. *continuation*

	TITLE	AUTHORS	AGENCY
<b>D. APPLIED RESEARCH TA/TV - FISHERIES</b>			
<b>BRONZE</b>	Development and Acceptability of Seaweed Paper and Utility Bags	Arnulfo B. Junio	Don Mariano Marcos State University
<b>E. APPLIED RESEARCH TA/TV - AGRICULTURE</b>			
<b>GOLD</b>	Andali RT-LAMP Test Kit: A new Generation of Molecular Quick Test Kit for Porcine Epidemic Diarrhea Virus (PEDV)	Clarissa Yvonne J. Domingo Rubigilda Paraguison Alili Aimee Carol R. Tangonan Lara Shinnette Valino	Central Luzon State University
<b>SILVER</b>	Rice Crop Manager: Tool Enhancing Climate Change Resiliency in Rice Production Systems in Bicol	Corazon A. Orbon Limberly F. Bermillo Ma. Lakambini S. Aldecoa Maridel Q. Bibay Edgar R. Madrid	DA-Regional Field Office 5
<b>BRONZE</b>	Assessment of Non-Refrigerated Storage Systems for Smallholder Onion Farmers	Rodelio G. Idago Renita SM. DelaCruz Domingo R. Miranda	Philippine Center for Postharvest Development and Mechanization
<b>F. SOCIOECONOMICS RESEARCH</b>			
<b>GOLD</b>	Assessment of the Mechanization Level and Requirement of Corn Farms in the Philippines	Hernaiz G. Malanon Renita SM. DelaCruz	Philippine Center for Postharvest Development and Mechanization
<b>SILVER</b>	Vulnerability Assessment of Agri-Ecotourism Communities as Influenced by Climate Change	Hanilyn A. Hidalgo	Central Bicol State University of Agriculture
<b>BRONZE</b>	Evaluating the Effects of Combine Harvester on Rice Production, Farm Income and Rural Employment	Hernaiz G. Malanon Renita SM. DelaCruz	Philippine Center for Postharvest Development and Mechanization
<b>G. DEVELOPMENT RESEARCH - FISHERIES</b>			
<b>SILVER</b>	Innovations in Growout Management for Increased Nile Tilapia ( <i>Oreochromis niloticus</i> L.) Production	Emmanuel M. Vera Cruz Eddie Boy T. Jimenez Bethzaida M. Apongol Donnie Ray G. Sanchez Jose S. Abucay Zaldy P. Bartolome	Central Luzon State University
<b>BRONZE</b>	Coral Reef Restoration Using Nursery-reared Coral Fragments as a Community-LGU-Ushered Coastal Restoration Strategy in Bicol Region	Antonino B. Mendoza Victor S. Soliman Plutomeo M. Nieves Florizel M. Lim	Bicol University Tabaco Campus and LGU San Fernando, Masbate



Table 11. *continuation*

	TITLE	AUTHORS	AGENCY
<b>H. DEVELOPMENT RESEARCH - AGRICULTURE</b>			
<b>SILVER</b>	Green Super Rice: Its Promotion and Commercialization in Bicol Region	Luz R. Marcelino Lorenzo P. Alvina Salvadora M. Gavino Ma. Bella R. Ilan Anacleto Esplana Jeanet Saldivar	DA-Regional Field Office 5
<b>SILVER</b>	Development of Mungbean Organic Fertilization Technology for Enhanced Productivity in Region 2	Rose Mary G. Aquino Orlando J. Lorenzana Vanessa Joy F. Calderon Cristy Dela Cruz Vilma U. Atalin	DA- Cagayan Valley Research Center and DA-Regional Field Office 2
<b>BRONZE</b>	Cassava Industry Development Project Towards Enhanced Upland Farming Productivity in Region 2	Rolando D. Pedro Lucrecio R. Alviar, Jr. Orlando J. Lorenzana Robert B. Olinares Rose Mary G. Aquino Rhegienald P. Ramos Arnold C. Valdez	DA- Cagayan Valley Research Center and DA-Regional Field Office 2

Table 12. NRS Best Posters

	TITLE	AUTHORS	AGENCY
<b>GOLD</b>	Screening and Evaluation of Blue-Green Algae as Feed Supplement	Evelyn H. Bandonill Henry M. Corpuz Melissa B. Dacumos Nevah Rizza L. Sevilla Lydia M. Morales Rosanna H. Cinense Milagrosa R. Martinez	Philippine Rice Research Institute, BFAR-National Freshwater Fisheries Technonology Center, and University of the Philippines Los Baños
<b>SILVER</b>	Assessment of Non-Refrigerated Storage Systems for Smallholder Onion Farmers	Rodelio G. Idago Renita SM. Dela Cruz Domingo R. Miranda	Philippine Center for Postharvest Development and Mechanization
<b>BRONZE</b>	Biotechnological Approach for Converting Cacao Pod Husk into High Dietary Fiber and Antioxidant-rich Bakery Ingredient	Teresita J. Ramirez Arsenia B. Sapin Alvin James Asaytono Catalino G. Alfafara	UPLB-National Institute of Molecular Biology and Biotechnology and UPLB-College of Engineering and Agro-industrial Technology

# Annual Events

## 2<sup>nd</sup> National CPAR Congress



Since its inception in 1999, CPAR has generated a lot of impact, providing relevant information generated through on-farm verification of developed agricultural technologies, and hastening the process of technology transfer for improving productivity in the project areas. It has strengthened RD&E with real-time confirmations of the effectiveness of technologies generated by research.

The CPAR has been witness to the farmers' and fishers' ability to surmount agricultural challenges in a scientific manner given the chance. It has proven to be a good model for government initiatives that call for partnerships with farmers/fishers and LGUs. It is inculcating effective entrepreneurship, transforming farmers to "farmer-scientists" and hence to farmer entrepreneurs. It has a multiplier effect as many of the farmers/fishers in the community who have become convinced of the "CPAR way" are helping spread the word. Slowly, but surely,

subsistence agriculture is giving way to profitable farming enterprises.

The CPAR Congress was unique as it was not researchers or research managers who made the presentations but the beneficiary farmers and fishers themselves. With descriptions of developments coming "straight from the horse's mouth", so to speak, the audience was able to immediately appreciate the use of CPAR technologies by the farmers and fishers, and by their neighbors. With the resounding success of the 1st CPAR Congress, it was clear that it should continue as an annual event.

On 11-12 November 2015, some 400 stakeholders that included farmers, fishers, researchers, experts, and scientists, representatives of local government units (LGUs), the academe and the private sector trooped to the Novotel Hotel in Quezon City to participate in the 2<sup>nd</sup> National Community-based Participatory Action Research (CPAR)





Congress of BAR. With the theme, “Paglinang sa Magsasaka at Mangangisdamang Mananaliksik tungo sa Maunlad na Pamayanan,” this year’s congress focused on the progress made by the program in nurturing and developing the knowhow and entrepreneurial skills of the CPAR cooperators, and on the progress of the farmers and fisherfolk themselves in developing their confidence in working in CPAR projects as individuals and as a group.

The 2015 CPAR Congress gave prominence to the successes of projects of DA Regional Field Offices 2, 3, 4a, 5, 7, and 10. This was based on project accomplishments in terms of production, post-production, marketing, and collaboration with the LGUs, and the means adopted to assure sustainability. Successful CPAR projects serve as models for emulation by other CPAR implementers and presentations during the plenary highlighted the best practices and lessons learned during their implementation.

Five regions were requested to present their stories on their CPAR experiences in the congress. These were presented along the theme of the congress. These stories were:

- 1) CVRC (Region 2). Improvement of the existing peanut cropping system that eventually led to the development of peanut products in Brgy. Arubub, Jones, Isabela.
- 2) CLIARC (Region 3). Integrated rice-based farming system in Candaba, Pampanga that increased production by 10-15 percent and promoted the use of organic fertilizer for enhanced productivity.
- 3) STIARC (Region 4a). Alternative livelihood for Polilio, Quezon coconut farmers in cacao production under challenging farmers’ conditions.
- 4) BIARC (Region 5). CPAR projects for improved productivity and incomes, such as rice-peanut integration, for farmer-cooperators in Region 5 that went through a rigorous process from PRA to upscaling to technology dissemination.
- 5) PLGU Cebu (Region 7). An LGU’s Perspective on CPAR implementation which identified monitoring and evaluation as critical for sustainability and for generating appreciation of significant results and impacts.
- 6) NOMIARC (Region 10). Accomplishments of project staff/researchers and farmer-cooperators, and the communities in the promotion of commodity-based farming systems in Region 10.





Aside from the presentations by the selected CPAR implementers, presentations on three special topics deemed very useful for successful CPAR implementation, were also done. These topics were: 1) Agricultural Credit Programs by the Agricultural Credit and Policy Council (ACPC); 2) Crop Insurance by the Philippine Crop Insurance Corporation (PCIC); and 3) Soil and Water Conservation Measures by the Bureau of Soils and Water Management.

The 2<sup>nd</sup> National CPAR Congress was also the venue chosen by BAR to express its gratitude to researchers, farmers and fisherfolks for their contributions to the success of programs under CPAR. It is through the support and cooperation of the farmers and their organizations that technology results from R&D are brought into the production mainstream. In the category of Natatanging CPAR Farmer-Cooperator, 38 farmers were recognized not only for their contributions to CPAR, but also for serving as models to other farmers interested in the CPAR technologies.

For the Natatanging CPAR Organization, 11 farmers' organizations representing 11 regions were recognized. These were: 1) Maticmatic-Leet CPAR Farmers' Association (Region 1); 2) Arubub Peanut Producers and Processors' Association (Region 2); 3) Visal San Pablo Multipurpose Cooperative (Region 3); 4) Binibitinan Cacao Growers' Association (Region 4a); 5) Caanduyog Farmers' Association (Region 5); 6) Brgy. Arac Farmers' Association (Region 6); 7) Baliang Farmers' Association (Region 7); 8) Kaangayan Farmers' Association (Region 9); 9) Imbayao Potato Growers' Association (Region 10); 10) CPAR-Bobongon Integrated Farmers' Association (Region 11); and 11) Santacati Small Fishpond Operators' Multipurpose Cooperative (Region 4b).

In return, the CPAR farmer-cooperators and adoptors participating in the CPAR Congress also expressed their gratitude to BAR's CPAR program and its management in their testimonies on how CPAR brought significant changes to their lives.





Awards were also given to the "Best Poster" from among poster presentations on 14 CPAR projects. First Place went to the poster of DA-RFO 2, titled, "Peanut Magic: CPAR Approach towards Enhanced Productivity in Corn-based areas of Region 2". Second Place was won by DA-RFO 10 with their poster titled, "Potato-based Farming System", while Third Place went to DA-RFO 4b with the poster titled, "Organic Lakatan-based Farming System".

The essence of CPAR was best summed up by DA Secretary Proceso J. Alcala in his message delivered by Atty. Dennis Guerrero, DA undersecretary and chief of staff, where he talked on the importance of community-based participatory researches as community members do not only act as beneficiaries but are also active partners directly involved in CPAR projects from their inception to completion. "With the merging of research initiatives with active community participation, the members of the community become empowered, thus leading to improvement in their productivity and incomes" said the Secretary.







# Awards and Recognitions

## UPLB recognizes BAR as one of its active R&D partners



The University of the Philippines Los Baños (UPLB) recognized the Bureau of Agricultural Research (BAR) as its valuable partner in research and development (R&D) during a Thanksgiving Dinner held on 21 October 2015 at Luxent Hotel, Quezon City.

This is the first time that UPLB hosted such event specifically to give recognitions and to express their gratitude to its active partner-government agencies in supporting their efforts to explore, discover, and disseminate research innovations, technologies, and knowledge products in agriculture, forestry, biotechnology, and other fields.

Giving the opening message was UP President Alfredo E. Pascual. He was fully aware of the fact that UP is challenged by low public investments in R&D. But in the recent years, the University has received substantial funding support

from various institutions. According to him, government agencies, including BAR, have been contributing to the significant increase in the university's R&D investments.

UPLB Chancellor Fernando C. Sanchez, Jr. affirmed the statement of Pres. Pascual and reiterated that the event was organized to show the appreciation of UPLB to its partners." This is because we acknowledge the fact that UPLB would not be what it is today if not for our partners' trust and confidence," said UPLB Chancellor Sanchez.

BAR is a long-time partner of UPLB and has been supporting the university's R&D initiatives on basic and applied researches in agriculture and biotechnology. Receiving the plaque of recognition in behalf of BAR Director Nicomedes P. Eleazar was Mr. Anthony B. Obligado, head of the Technology Commercialization Division of BAR.

## BAR's support to UPLB students recognized



To show its appreciation and gratitude to both government and private institutions who have been providing assistance to students of the University of the Philippines Los Baños (UPLB) through scholarship and loan donors, the UPLB Office of Student Affairs (OSA) held the “Isang Pasasalamat...Isang Parangal” on 11 June 2015 at Makiling Hall, UPLB, Laguna. The celebration was also part of the 55th anniversary celebration of OSA.

One of the institutions acknowledged was the Bureau of Agricultural Research (BAR).

Conducted only for the first time, the event also gave recognition to each donor institution's graduating scholars.

Launched in 2012, in partnership with UPLB, BAR has been giving scholarship assistance to selected UPLB agriculture and agri-biotechnology undergraduate students through its Undergraduate

Scholarship Program (UGSP). To date, BAR has provided scholarships to 35 students, 7 of whom have already graduated, 2 of which finished magna cum laude and 3 were cum laude.

Receiving the award for the BAR was Dr. Nicomedes P. Eleazar, bureau director. He was joined by Ms. Digna Sandoval, head of BAR-Institutional Development Division (IDD), who handles and coordinates all projects and programs under the Human Resources Development Program (HRDP).

Aside from UGSP, the program also provides assistance to R&D employees through the Degree Scholarship Program for those pursuing graduate studies (MS and PhD) (DSP), and the Non-Degree Scholarship Program (NDSP) for those conducting their thesis/dissertation studies as well as those who wish to attend specialized trainings, collaborative R&D undertakings, or international scientific fora.



## BAR's researches on rubber help high school students win award



They were interested in studying the potential of rubber but have little information on hand. Hence, three junior high school students, Ian Tagle, Alexis Magtibay, and Ellha Nicolas of the Makati Science High School visited the Bureau of Agricultural Research (BAR) to gather information and existing technologies on rubber.

Ms. Jennilyn Castañeto, technical staff from the bureau's Technology Commercialization Division, discussed to them some of the rubber technologies generated from BAR-funded researches. After that, the students were referred to Dr. Art Castillo, proponent of a BAR-UPLB project on rubber. Dr. Castillo shared his expertise on rubber production and, through the course of learning, the students were given a chance to actually tap from a rubber tree. The sap collected was utilized in the experimentation on concrete alternatives that was the students' project.

The students' research paper on rubberized concrete mixture was presented during the Kaohsiung International Invention Exhibition, organized by the World Invention Intellectual Property Associations, on 19-21 December 2014 in Taiwan. The judges were so pleased with their research that they bagged the gold medal.

Concrete is a vital constituent in the foundation of any architectural structures (buildings, roads, dams, bridges, skyscrapers, among others). To keep up with demand of the 21st century urbanization and with the increasing establishment of high-rise buildings, condominiums, malls in the country, it is deemed relevant to provide technologies to address issues related to building requirements.

"The rubberized concrete mixture is incredibly useful in decreasing the manual labor required and the load in interior materials made of concrete," Ian said.

Ellha Nicolas shared that the addition of rubber tree sap or 'latex' to a concrete mixture permits the final product to be much lighter compared to that of the original concrete mixture. "The study was purely experimental but the results we garnered were surprising and extraordinary," Alexis Magtibay added.

Rubber is one priority industrial crops of BAR under the DA's High Value Crops Development Program. The bureau, as the tasked agency to lead the R&D component of the DA's National Rubber Development Program (NRDP), has funded 17 R&D projects to support the development and commercialization of natural rubber in the Philippines.

## Newly-appointed, promoted BAR staff took oath



Twenty-four newly-appointed/promoted staff members of the Bureau of Agricultural Research (BAR) took their oaths on 5 October 2015 at the 4F of the RDMIC Building, Visayas Ave., Diliman, Quezon City.

Officiating the oath-taking ceremony were BAR Director Nicomedes P. Eleazar and Asst. Director Teodoro S. Solsoloy.

Also present to witness the activity were BAR staff from the various divisions/units led by Ms. Ludivina Pelayo, personnel officer.

Among the 22 BAR staff members who took their oaths were: Joell Lales and Anthony Obligado (Chief Agriculturists); Salvacion Ritual (Information Officer V); Digna Sandoval and Julia Lapitan (Supervising Agriculturists); Leoncia del Mar, Ethcel Libang, Cynthia Remedios de Guia, Amavel Velasco, Rhea Desalesa, and Wilson Viloria II (Senior Agriculturists); Alexander Arizabal, Jr. (Information System Analyst III); Rita

dela Cruz and Evelyn Juanillo (Information Officer III); Maria Elena Garces (Information System Analyst II); Ma. Eloisa Aquino and Mara Shyn Valdeabella (Information Officers II); Gian Carlo Espiritu, Alvin Fontanil, Marjorie Mosende (Agriculturists II); Judith Maghanoy (Administrative Officer IV); Julieta Yonzon (Statistician I); Gretel Rivera (Administrative Officer II); and Lady Christine Joy Barcena (Administrative Assistant III).

BAR Director Nicomedes P. Eleazar, in his message during the oath-taking, told the newly-appointed/promoted staff to give importance to their new jobs/positions as they are all crucial in the overall function of the bureau. He also reminded everyone to be proud of what each has been able to achieve regardless of where and what the position is. "You are all government employees. As such we need to act accordingly in service of the Filipinos, particularly our stakeholders in R&D." In closing, he congratulated everyone and encouraged them to continuously improve.



# ANNEXES





# Activity Highlights

## JANUARY

### 103 CPAR, 83 NTCP projects funded in 2014

As the lead and coordinating agency in agriculture and fisheries research and development (R&D), BAR continues to be responsive to the needs of the sector particularly in bringing products of research at the grassroots level. This is realized through the implementation of its two major banner programs, the Community Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP).

In 2014, 103 CPAR projects were funded and coordinated of which 9 are new and 94 are on-going. CPAR projects covered 551 sites nationwide. Nine of the new projects focus on the different farming systems such as sugar apple + vegetable + legume from Department of Agriculture-Southern Tagalog Integrated Agricultural Research Center (DA-STIARC), and rice-yellow corn+ okra + mungbean + cattle implemented by the Municipal Local Government Unit (MLGU) of Sta. Barbara, Pangasinan.

Another new CPAR project is the Polyculture of Milkfish (*Chanos chanos*, Forskal) and Black Tiger Prawn (*Peneaus monodon*) in Hagonoy, Bulacan implemented by the Bureau of Fisheries and Aquatic Resources-Regional Field Office 3 (BFAR- RFO 3) which aims to improve skills of the fishers through sustainable and environment friendly fish farming technology.

For NTCP, 83 projects were funded out of which 45 are new and 38 are on-going.

Among the newest commercialized technologies under the crops category were from Tarlac College of Agriculture (TCA) in its off-season tomato production which focuses on the production of off-season tomato and the development of different products including dried tomato, wine, vinegar and juice; and Pampanga Agricultural College's (PAC) project on lotus which looks into its potential in the production of food and non-food products.

For livestock, there were 9 new and 13 on-going projects including the commercialization and institutionalization of Artificial Insemination (AI) for goats delivery system in Cagayan Valley of Isabela State University (ISU), and development of organic feeds for broiler chicken and duck layer in Region 3 of Pampanga Agricultural College (PAC).

NTCP also supported 3 new and 4 on-going fishery projects which include University of the Philippines Diliman-Marine Science Institute's (UP-MSI) development of new areas for seaweed farms which concentrates on the development and expansion of areas for seaweed farming in Bolinao to increase the production of seaweed raw materials.

## FEBRUARY

### Stipend of BAR scholars increased

Effective February 2015, regular employees from the National Research and Development System for Agriculture and Fisheries (NaRDSAF) who will apply and succeed in the evaluation for a BAR Degree Scholarship Program will receive an increased monthly stipend of Php 17,000 and Php 25,000 for Master's (MS) and Doctor's (PhD) degrees, respectively. Before, the stipend for MS and PhD was Php 12,000.

This development initiated by BAR top management will help defray the educational expenses of

scholars considering today's higher cost of living compared to five years ago when the stipend was last amended. Aside from monthly subsistence, their full matriculation, miscellaneous fees, reimbursable book/photocopying/book binding allowance, which can reach up to Php 10,000 per regular semester and Php 3,000 per summer class, will also be shouldered by the scholarship.

Meanwhile, for scholars studying outside their region, BAR will provide a one-time relocation allowance of Php 10,000 and reimbursable



# Activity Highlights

economy round trip travel fare to and from place of official station.

A key feature that makes this scholarship stand out among other scholarships is the hefty sum of thesis/dissertation support worth Php 100,000. With this amount, scholars can jumpstart basic/applied researches that may require costly supplies, reagents, and laboratory analysis. Another distinct feature is that it is open to applicants below 45 years old for MS degree, or 50 years old for PhD degree.

When the scholar is about to graduate, BAR will cover the cost for graduation fees and will give a

cash award of Php 20,000 to scholars who can finish their degree on or before the expected time of completion.

To ensure that the scholars will receive the best quality of higher education, applicants should be admitted in any of the following universities that are considered Centers of Excellence: UP System (UP Diliman, UP Manila, UPLB, UP Visayas, UP Mindanao), Central Luzon State University (CLSU), Visayas State University (VSU), University of Southern Mindanao (USM), De La Salle University (DLSU), Ateneo de Manila University (ADMU), and Mindanao State University (MSU) System.

## MARCH

### BAR-supported R&D facility for apiculture in SLSU inaugurated

Southern Luzon State University (SLSU)-Tiaong Campus inaugurated the "Apiculture Processing Center for Organic Agriculture" on 25 March 2015 in Tiaong, Quezon. Leading the ceremonies were Dr. Nicomedes P. Eleazar, director of the Bureau of Agricultural Research (BAR) and Dr. Cecilia N. Gascon, president of SLSU. Supported under the bureau's Institutional Development Grant (IDG) Program, the facility caters to both researchers and local beekeepers, new and established, in generating and disseminating technologies necessary to strengthen the program in the province.

Known for its huge potential in providing income and livelihood to Filipinos while maintaining and sustaining an organic biodiversity, beekeeping or apiculture, is one of the major programs currently being supported by DA. With this, BAR has supported a number of projects and activities that aim to generate and promote the various technologies to further enhance and manage this promising industry. Aside from commercialization projects, BAR supports the establishment of R&D

facilities in DA-Regional Field Offices and state universities and colleges (SUCs) that implement R&D projects and activities.

SLSU, known as one of the department's major partners in strengthening agriculture and fishery R&D, specifically on rainfed and organic agriculture, has implemented various projects that seek to generate technologies for dissemination and outscaling to our farmers and fishers. Through this facility, SLSU expects to analyze, assess, and promote apiculture technologies generated by researchers and beekeepers towards producing honey and by-products that are better in terms of quality and quantity. With the major activities planned to be held in the center, local beekeepers and those interested to engage in the industry can expect to have better understanding and training on product development and practice of beekeeping, not just harvesting honey and by-products. The center will also serve as a showroom and business center for the products while its laboratories will cater to bee diseases analysis.

# Activity Highlights

## APRIL

### BAR stages 4th Scholars' Fellowship Night

The Bureau of Agricultural Research (BAR) recently spearheaded the 4th BAR Scholars' Fellowship Night on 16 April 2015 at EDSA Shangri La Hotel, Manila. The activity was a tribute for the several milestones accomplished through the bureau's Degree Scholarship Program (DSP). It also served as a venue to encourage interaction and communication between and among the scholars and the stakeholders.

Since its inception in year 2000, DSP has already produced 99 graduates (49 MS and 50 PhD). Thirty-two graduates are from the Department of Agriculture (DA) national agencies while 67 came from both DA regional agencies and state universities and colleges (SUCs). There are 24 on-going scholars composed of 15 MS and 9 PhD of which 4 on-going scholars are from DA national agencies and 20 are from both DA regional agencies and SUCs.

Around 170 participants attended the event, most of whom come from the group of completed and on-going undergraduates, MS, and PhD. The rest were members of the BAR management and staff, and other stakeholders.

One of the highlights of the event was the

launching of the Directory of BAR Scholars, a consolidation of profiles of all the BAR scholars including those who have completed their degrees and those on-going ones. The directory also serves as a database for the network of R&D professionals that the program has produced.

Most of the BAR scholars who delivered their testimonials are now of high rankings in their respective offices and agencies either DA officials, SUC presidents, administrators, deans, research directors/managers, or senior researchers. Their testimonials inspired the attendees, particularly the on-going undergraduates, to strive hard and finish the course.

In 2012, BAR launched the "Scholarship Program for UPLB Agriculture and Agri-Biotechnology Undergraduate Students" to increase the number of Agri-Fisheries R&D professionals. The program, which is now on its third year, has already supported 35 students, two of which graduated Magna cum Laude. In 2014, BAR and DA Biotechnology Program institutionalized the "Biotechnology Scholarship Grant for UPLB Undergraduate Students" specializing in BS Agricultural Biotechnology (BS ABT). There are 15 ongoing scholars under this scholarship.

## MAY

### 5M IDG project to put up a PGR lab and training center

The Bureau of Agricultural Research (BAR), through its director, Dr. Nicomedes P. Eleazar, officially sealed its support to the project "Establishment of Plant Genetic Resources (PGR) Laboratory and Training Center" at the Central Bicol State University of Agriculture (CBSUA) on 19 May 2015. Signing the Memorandum of Agreement (MoA) for the PhP 5M-project opposite Dir. Eleazar was CBSUA Vice President for Research and Development, Prof. Josephine F. Cruz.

Funded under the bureau's Institutional

Development Grant (IDG) Program, the project is set to be instrumental in promoting sustainable use of PGR and to capacitate the Bicolano researchers, scientists, students, farmers, and other stakeholders on PGR research and development (R&D). CBSUA, known to be the center of excellence in agriculture in the Bicol region, is one of the bureau's partners in promoting PGR specifically its initiative on biodiversity conservation.

The facility, which will house science laboratories,



# Activity Highlights

a museum, and a training center, will serve as the CBSUA's and the entire Bicol region's center in the conduct of planning, development, and implementation of regional programs on PGR as well as the region's germplasm bank of economically-important plants in the locality. It will be open to farmers, researchers, and the general public who wish to be trained and be capacitated on PGR practices and other relevant information.

The MoA covers the construction of a two-storey building composed of science laboratories for Phytochemical Screening, Clinical Plant Science, DNA Testing, Tissue Culture, and Seed Testing and

Planting Materials, National Science Museum, and Training Center as well as the procurement of facilities and equipment.

With attaining food sufficiency and food security at the forefront of the goals and priorities of DA, PGR R&D has become one of BAR's major strategies toward strengthening the conservation of plant genetic diversity. With this, the bureau has placed great emphasis on PGR R&D as it focuses on exploring, collecting, regenerating, characterizing, evaluating, and conserving traditional crops, which are crucial in ensuring food sources.

## JUNE

### Medium term plan for Climate Change R&D updated

To mainstream climate change concerns across all its research, development, and extension (RDE) programs, projects, and plans, the Bureau of Agricultural Research (BAR) spearheaded a roundtable discussion on 9-11 June 2015 in Clark, Pampanga to review, update, and finalize the BAR's Climate Change RDE Agenda for 2016-2022.

BAR Director Nicomedes P. Eleazar, in his message, pushed for a responsive and science-based Climate Change R&D Agenda and Action Plan that will be the bureau's guiding policy in mainstreaming climate change concerns in its RDE plans and programs. According to the bureau chief, it is important that the identified specific strategies for RDE activities be aligned with the current climate change thrusts and directions of the National Climate Change Action Plan R&D Priorities 2011-2028 and the DA's Systems-wide Adaptation and Mitigation Initiatives on Agriculture (AMIA). "With the crafting of the revised agenda, we hope to include landscape-scale research on food security and natural resources, policy, and governance in order to

achieve agricultural resilience to climate change and build up our capacity to meet expectations," he said.

Director Eleazar furthered that the workshop's output will also aid in the crafting of the Philippines' integrated and unified position for the upcoming international symposium on "Planning a Collaborative RDE Program on Climate Change among APEC Member Economies" which will be held in September 2015. The symposium is expected to develop a joint RDE agenda on climate change adaptation and mitigation among APEC member economies and to identify enabling mechanisms to implement such agenda.

During the workshop proper, the pool of experts was divided into three sectors according to their fields of expertise: crops, livestock and poultry, and fisheries and aquaculture. Considering each component of the whole value chain from input down to policy, researchable areas for each sector were revalidated and further fine-tuned after which, the outputs were presented.

# Activity Highlights

## JULY

### R&D facilities at UPLB and PSAU inaugurated

Representing Agriculture Secretary Proceso J. Alcala as guest of honor and speaker, Bureau of Agricultural Research (BAR) Director Nicomedes P. Eleazar led the inauguration of the "Plant Tissue Culture Facility (PTCF)" at the University of the Philippines Los Baños (UPLB). This facility, funded by the Department of Agriculture -High Value Crops Development Program (DA-HVCDP), is composed of molecular- and micro- biological laboratories, training and meeting rooms, and production area for priority crops such as banana, abaca, and macapuno.

In his keynote, Dir. Eleazar said "for the country to attain food security and sustainability, investment on mature R&D technologies such as tissue culture is needed to produce quality and disease-free planting materials". In attaining these goals, he underscored the role of DA in enhancing the R&D facilities of government academic institutions, and UPLB as sources of technologies and experts in agriculture.

Present in this activity were key officials from DA and academe including Director Jennifer E. Remoquillo of DA-HVCDP; OIC Executive Director Clarito M. Barron of Philippine Fiber Industry Development Authority; UPLB Chancellor Fernando C. Sanchez Jr.; UPLB College of Agriculture Dean Domingo E. Angeles; Chairman Feliciano B. Calora Sr. of the Board of Trustees, Philippine Agriculture and Resource Research Foundation Inc.; PTCF Project Leader Rene Rafael C. Espino; and other stakeholders.

Following the PTCF inauguration, Dir. Eleazar attended the inauguration of two more R&D facilities at UPLB. These were the: "Post Harvest Horticulture Training and Research Center (PHTRC)" and "Biofuels Research Laboratory (BRL)". The PHTRC was established to promote the postharvest technologies developed by UPLB while the BRL will focus in conducting researches that make use of biomass as an alternative energy source.

Dr. Josephine U. Agravante, head of the PHTRC, expressed her gratitude to BAR for supporting the project which is a brainchild of Emeritus Professor and Project Leader Edralina P. Serrano, and their team which was conceived 18 years ago. On the other hand, Prof. Rex B. Demafelis, head of BRL, said that with their new facility, their researchers have gained additional confidence in producing biofuels R&D outputs.

Meanwhile, Mr. Anthony B. Obligado, OIC head of the Technology Commercialization Division (TCD) headed to Pampanga State Agricultural University (PSAU) for the inauguration of the Nutraceutical Research Laboratory (NRL).

The R&D facilities were funded through BAR's Institutional Development Grant (IDG). It is a fund support awarded to R&D institutions in the form of grants to efficiently and effectively implement and manage R&D programs/activities in agriculture and fisheries. The program aims for the improvement of quality of research outputs through state-of-the-art facilities and laboratory equipment.

## AUGUST

### Alcala underscores increasing budget for R&D

"There is a need to match agricultural research output with the actual needs of the sector, especially our farmers and fisherfolk," thus the challenge and appeal of Agriculture Secretary Proceso J. Alcala who served as the guest of honor, during the opening ceremony of the 11<sup>th</sup>

Agriculture and Fisheries Technology Forum and Product Exhibition held on 7 August 2015 at SM Megatrade Hall, SM Megamall, Mandaluyong City.

Secretary Alcala mentioned the need to intensify the results of research since there are new



# Activity Highlights

programs and products being promoted. Speeding up the commercialization process of agri-fishery products and technologies will create local and international markets that will serve as springboards for farmers' and fishers empowerment. "We need to identify specific areas where the results of researches will be actually used for the betterment of the lives of our farmers and fishers. We do not want these to remain in research journals and gather dust in libraries," Alcala reiterated.

The DA chief also articulated the need to anticipate potential buyers while doing research. He likewise congratulated the Bureau of Agricultural Research (BAR) for spearheading the event and for providing the public an access to government-supported initiatives in the agriculture and fisheries sector.

Alcala noted that the government support to agricultural research is reflective of BAR's funding which has been increasing since 2010, when it was given a budget of P281 million, to P1.12 billion in 2015.

The secretary urged the sector to do its share in strengthening R&D in the country. He likewise pleaded to whoever his next predecessor would be to continue the strong support to BAR since the agency reinforces agri-fishery growth.

Also gracing the event was Senator Cynthia Villar, chairperson of the Senate Committee on Agriculture and Food and former DA Secretary and former Secretary-General of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Dr. William Dar.

## SEPTEMBER

### PHI leads ASEAN agri leaders meeting; DA strengthens policy on food quality and safety

Ten years after the APEC Meeting was last held in the Philippines, the Department of Agriculture (DA) once again had the privilege of hosting a series of ministerial meetings that included the 37<sup>th</sup> Meeting of Association of Southeast Asian Nations (ASEAN) Ministers on Agriculture and Forestry (AMAF), 15<sup>th</sup> Meeting of AMAF Plus Three Ministers on Agriculture (AMAF+3), and the 4<sup>th</sup> ASEAN-India Ministerial Meeting on Agriculture and Forestry (AIMMAF). These meetings were held on 7-11 September 2015 at The Peninsula Manila, Makati City.

The AMAF and related meetings were attended by ministers from agriculture, fisheries, and forestry of the 10 ASEAN member-countries including Brunei, Cambodia, Indonesia, Lao PDR,

Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam; ministers from the ASEAN+3 that included Japan, South Korea, and China; India for the AIMMAF; deputy secretary-general of the ASEAN Secretariat; representatives of dialogue-partner multilateral organizations; and representatives from ASEAN civil society organizations.

The ministerial meetings were significant to the member countries as these provided opportunities and venues to tackle and finalize actions regarding the regional cooperation's policy framework on food, agriculture, and forestry.

Agriculture Secretary Proceso J. Alcala, in

# Activity Highlights

his statement, said that the country should be looking for the harmonization and alignment of product and production standards with that of the ASEAN especially on food quality and safety. This is why DA has strong initiatives to standardize the guidelines on good agricultural practices and good animal husbandry practices, and has already enacted laws including the Organic Agriculture Act and Food Safety Act, among others.

In relation to this initiative, the Bureau of Agricultural Research (BAR) as the national coordinating and funding agency for research and development (R&D) of DA is tasked under Organic Agriculture Act of 2010 to take the lead

in coordinating the DA's R&D initiatives on organic agriculture.

As of 2014, BAR has been coordinating 33 organic agriculture projects nationwide. Also, the bureau, through its National Technology Commercialization Program, has been taking on R&D initiatives and activities to develop and commercialize technologies that have potential market both locally and globally.

On the 37th AMAF, the DA assured that the country will comply and follow the specified standards under the terms of the Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry 2016-2025 endorsed by AMAF.

## OCTOBER

### 10 technology guides from BAR-supported projects

In an effort to bring technologies and products of Research and Development (R&D) closer to the people and those who need them the most, the Bureau of Agricultural Research (BAR), collaborated with researchers from the University of the Philippines Diliman, to produce 10 technology guides out of BAR supported R&D initiatives.

The publication called Techno Digest is a booklet series containing information materials featuring recommended production and management technologies for growing selected agricultural crops, livestock and poultry, and fisheries. The 10 commodities featured in the Techno Digest were: abalone, Cardaba banana, garlic, giant freshwater

prawn, native chicken, upgraded Philippine native goat, Queen pineapple, Kappaphycus and Gracilaria seaweeds, and sampinit.

The technology guides, prepared by Dr. Marideth R. Bravo and Dr. Dina C. Magnaye of the University of the Philippines Diliman, are products of research works and consultations with experts who contributed to the generation of appropriate technologies.

The 10 booklets were officially launched and introduced to the public on October 15, 2015 during the awarding ceremony of the 27th National Research Symposium (NRS) held at the Sulo Riviera Hotel, Diliman, Quezon City.



# Activity Highlights

## NOVEMBER

### Roundtable discussion on technology business incubation held

To explore mechanisms of further enhancing the commercialization of technologies developed from research and development (R&D) initiatives in the agriculture and fisheries sector, the Bureau of Agricultural Research (BAR), through the Technology Commercialization Division (TCD), spearheaded a roundtable discussion on technology business incubation (TBI) on 25-27 November 2015 in Sta. Rosa, Laguna.

This is in line with BAR's efforts to strengthen one of its banner programs, the National Technology Commercialization Program (NTCP), that enhances value-adding of products and technologies generated by its partner institutions, making it a vital tool for enterprise development and agribusiness ventures in agriculture and fisheries-related industries. With

this, the bureau looks at the potential of TBI in promoting competitive agribusiness enterprise development through technology development and commercialization towards facilitating business among technology developers and adopters/entrepreneurs.

According to Dr. Nicomedes P. Eleazar, director of BAR, the activity served as an important venue to facilitate discussion among experts and TBI focal persons that will help the bureau in strategizing and formulating a plan aimed at implementing TBIs in the country in conjunction with existing TBI government facilities. The TBIs are planned to be put up particularly in the three major islands, Luzon, Visayas, and Mindanao in partnership with the Department of Agriculture-Agribusiness and Marketing Assistance Service (DA-AMAS).

## DECEMBER

### 2015 Gawad Saka outstanding scientist, researcher announced

Hosted by the Department of Agriculture (DA), the Gawad Saka Award, an annual search for outstanding achievers in agriculture and fisheries, named Dr. Allan P. Dargantes of the Central Mindanao University (CMU) and Ms. Wilhelmina P. Castañeda of DA-Regional Field Office (RFO) I as this year's Outstanding Agricultural Scientist (OAS) and Outstanding Agricultural Researcher (OAR), respectively. The awarding ceremony, graced by Hon. Senator Cynthia A. Villar and Secretary Proceso J. Alcala, was held on 9 December 2015 at the Philippine International Convention Center in Pasay, Manila.

Dr. Dargantes is the dean of the College of Veterinary Medicine of CMU. His advocacy in utilizing molecular diagnostics for Surra, an important disease among large ruminants, resulted in improved animal health and disease management in Region 10. On the other hand, Ms. Castañeda, supervising agriculturist at DA-RFO 1, promoted the use of recently developed technologies on garlic production to boost the income of farmers in the region.

The activity was attended by farmers, fishers, and their families from Luzon, Visayas, and Mindanao; municipal and provincial agricultural officers; DA-RFOs directors, DA-bureau directors; and officials from DA.

Director Nicomedes P. Eleazar, chairperson of the Search for Gawad Saka OAS and OAR, assisted Sec. Alcala in awarding to Dr. Dargantes and Ms. Castañeda the presidential trophies, citations, cash awards, and research grants worth Php 2,000,000 each. The grants are a 100 percent increase from last year's incentive which aim to encourage more researchers to share their mature technologies with farmer- or fisher-cooperators and be named champions of agriculture R&D.

Winners received presidential trophies and citations, as well as cash awards and/or project grants from the respective bureaus that spearheaded the categories.



## BAR Key Officials

Office of the Director

**Dr. Nicomedes P. Eleazar, CESO IV**

E-mail: [neleazar@bar.gov.ph](mailto:neleazar@bar.gov.ph)

Phone: +63 2 928-8624 locals 2125-2128

Fax: +63 2 927-5691

Office of the Assistant Director

**Dr. Teodoro S. Solsoloy**

E-mail: [tsolsoloy@bar.gov.ph](mailto:tsolsoloy@bar.gov.ph)

Phone: +63 2 928-8624 local 1149

Fax: +63 2 920-0235

Planning and Project Development Division

**Joell H. Lales**

Email: [jlales@bar.gov.ph](mailto:jlales@bar.gov.ph)

Phone: +63 2 928-8624 local 2123 or 3127

Project Monitoring and Evaluation Division

**Salvacion M. Ritual**

Email: [sritual@bar.gov.ph](mailto:sritual@bar.gov.ph)

Phone: +63 2 928-8624 local 3121

Institutional Development Division

**Digna L. Sandoval**

Email: [dsandoval@bar.gov.ph](mailto:dsandoval@bar.gov.ph)

Phone: +63 2 928-8624 local 2107

Technology Commercialization Division

**Anthony B. Obligado**

Email: [aobligado@bar.gov.ph](mailto:aobligado@bar.gov.ph)

Phone: +63 2 928-8624 local 2135





## BAR Key Officials

Applied Communication Division

**Julia A. Lapitan**

Email: [jlapitan@bar.gov.ph](mailto:jlapitan@bar.gov.ph)

Phone: +63 2 928-8505 local 1136

Administration and Finance Division

**Roberto S. Quing, CPA**

E-mail: [rquing@bar.gov.ph](mailto:rquing@bar.gov.ph)

Phone: +63 2 920-0223 local 1129

Information Management Unit

**Melissa A. Resma**

Email: [mresma@bar.gov.ph](mailto:mresma@bar.gov.ph)

Phone: +63 2 920-0205 local 3107

Internal Audit Service

**Gretel F. Rivera**

Email: [grivera@bar.gov.ph](mailto:grivera@bar.gov.ph)

Phone: +63 2 928-8505 local 1147





**Citation:**

2015 BAR Annual Report. (2016). Department of Agriculture-Bureau of Agricultural Research: Diliman, Quezon City, Philippines.

*This report was prepared and packaged from the reports of the different divisions and units of the Bureau of Agricultural Research.*

**Editor:** Rita T. dela Cruz

**Consulting Editors:** Julia A. Lapitan and Victoriano B. Guiam

**Writers:** Daryl Lou A. Battad, Anne Camille B. Brion, Rita T. dela Cruz, Diana Rose A. de Leon, Ephraim John J. Gestupa, Victoriano B. Guiam, Patrick Raymund A. Lesaca, Mara Shyn M. Valdeabella

**Layout/Design:** Rita T. dela Cruz

**Photos:** BAR Applied Communication Division

**Print Manager:** Anthony A. Constantino

**Advisers:** Dr. Nicomedes P. Eleazar, *CESO IV* and Dr. Teodoro S. Solsoloy

For more information, write, call or visit us at:

**APPLIED COMMUNICATION DIVISION**

Bureau of Agricultural Research

Department of Agriculture

Visayas Ave., cor Elliptical Rd.,

Diliman, Quezon City 1101

Email: [acd@bar.gov.ph](mailto:acd@bar.gov.ph)

*This report is published by BAR and can also be viewed or downloaded from [www.bar.gov.ph](http://www.bar.gov.ph)*

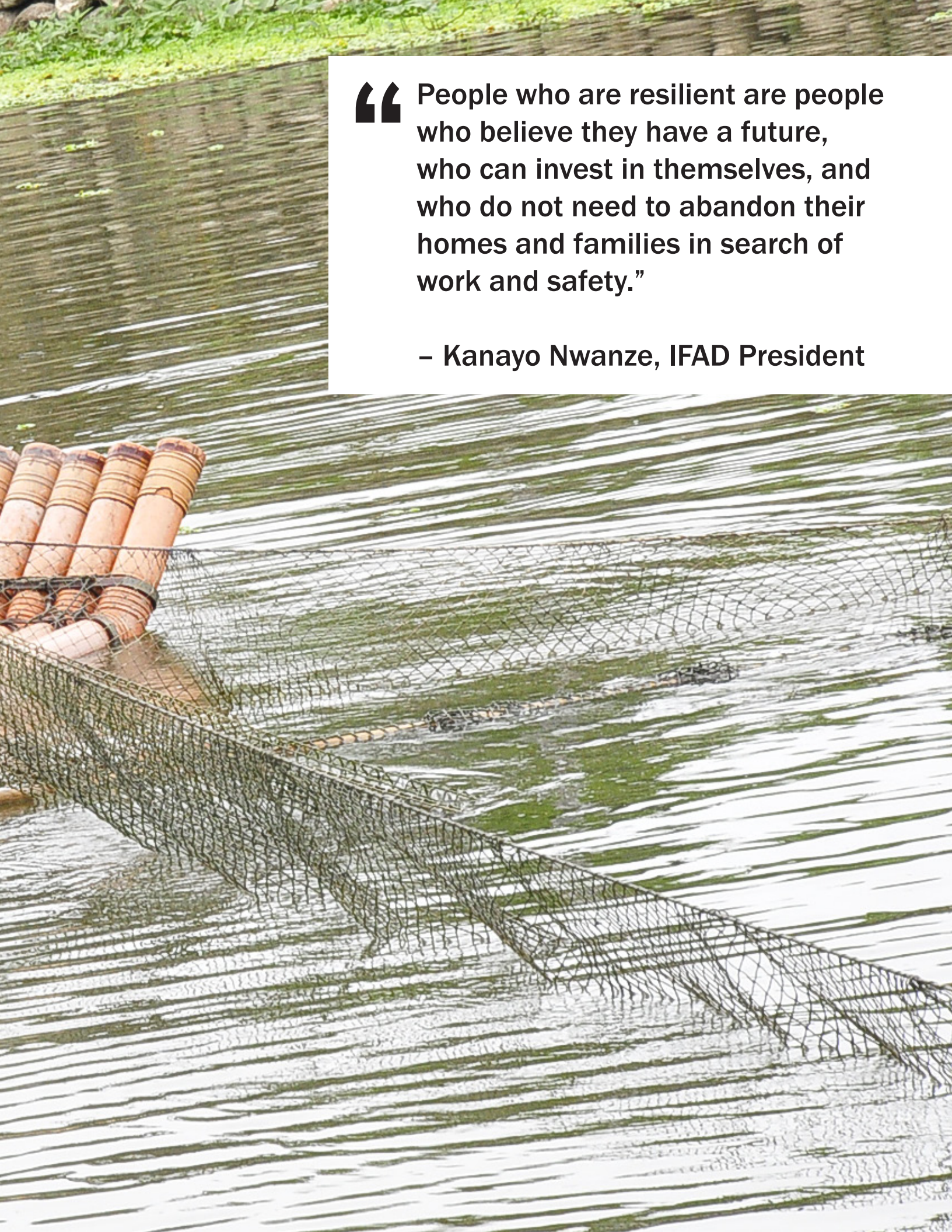
ISSN 1655-3950

© Bureau of Agricultural Research, Department of Agriculture 2016







The background image shows a body of water, likely a river or lake, with a fishing net stretched across it. The net is made of a dark, fine-mesh material and is supported by several orange, cylindrical floats. The water is calm, reflecting the sky and the net. In the upper left corner, there is a small patch of green grass and a wooden fence. The overall scene suggests a traditional fishing activity.

**“ People who are resilient are people who believe they have a future, who can invest in themselves, and who do not need to abandon their homes and families in search of work and safety.”**

**– Kanayo Nwanze, IFAD President**



ISSN 1655-3950

RDMIC Building, Visayas Avenue, corner Elliptical Road  
Diliman, Quezon City, Philippines 1101  
Trunklines: +63 (2) 9288505, 9200205, 9263334  
Facsimile: +63 (2) 9275691  
Email: [rd@bar.gov.ph](mailto:rd@bar.gov.ph)  
Website: [www.bar.gov.ph](http://www.bar.gov.ph)  
Facebook: Bureau of Agricultural Research  
Instagram: [@dabarofficial](https://www.instagram.com/dabarofficial)