



2011 BAR ANNUAL REPORT

Providing better

OPPORTUNITIES

through R&D

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In 2011, BAR made significant progress in funding researches that would not only boost agricultural productivity but would also promote smallscale farming and fishing communities more market-oriented. Expanding the market linkages of farmers and fishers will also provide them opportunities not only to produce more but to earn more.

Evidence and experience show that sustaining the productivity-based agricultural growth depends on expanding market opportunities and requiring farmers to “think beyond what they produce” and to incorporate profitability and competitiveness in their production.

Strengthening the ability of the resource-poor farmers and fishers to access market opportunities and diversifying their linkage can play significantly in reducing poverty and achieve overall agricultural growth.



Better opportunity means making smallscale farming and fishing more market-oriented, making markets work for the poor.

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PROVIDING BETTER OPPORTUNITIES THROUGH R&D

Better opportunities mean making smallscale farming more market-orientated, making markets work for the poor.

In 2011, BAR has made significant progress in funding researches that would not only boost agricultural productivity but would also promote smallscale farming and fishing communities more market-oriented. We believe that by expanding the market linkages of our farmers and fishers, we are also providing them opportunities not only to produce more but to earn more.

Evidence and experience show that sustaining the productivity-based agricultural growth depends on expanding market opportunities and requiring farmers and fishers to “think beyond what they produce” and to incorporate profitability and competitiveness in their production.

The main concern among farmers and fishers is not only productivity and household food consumption, but more on better market access and opportunities. Farmers seek income-generating activities for their household needs rather than merely for consumption. They need to increase production so that they could earn more.

Enhancing the ability of our resource-poor farmers to access market opportunities and diversifying their linkage could play significant roles in reducing poverty and achieved significant agricultural growth.

With the implementation of the two banner programs, CPAR

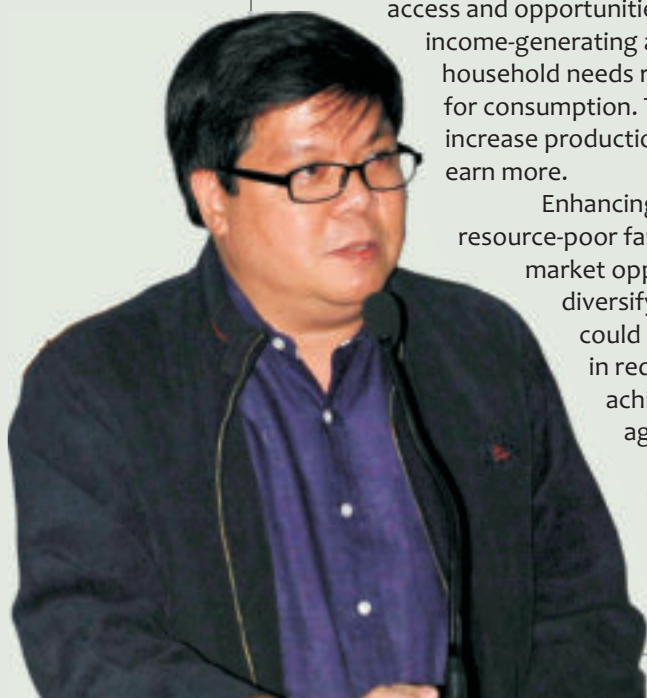
and NTCP, BAR has emphasized on transforming subsistence agriculture to make farming a business. Likewise, the bureau promoted entrepreneurship among rural communities where farmers and fishers produce for markets rather than trying to market what they produce.

For 2011, 205 CPAR projects were implemented covering 502 sites nationwide and benefitting 10,037 farmers. Compared to the 176 CPAR projects implemented in 2010, there is a 16 percent increase and a 14 percent increase in beneficiaries from last year's 8,794 farmers and fisherfolk who benefitted from the projects. For NTCP, 122 projects were implemented from which 88 are new and 34 are on-going. There was a huge increase in the NTCP projects funded, from the 13 funded in 2010.

The increase in the number of projects funded and supported by BAR was reflective of the increase in the budget for R&D that the bureau was managing in 2011. The augmented budget allocation of the government was in view of intensifying and strengthening R&D initiatives that will provide great impacts and benefits at the grassroot level.

Aside from the increase in CPAR and NTCP projects, BAR was tasked as the national focal agency of various RDE programs of the Department of Agriculture (DA). BAR serves as the focal agency for the RDE components of seven on-going programs, namely: Organic Agriculture, Climate Change, Biotechnology, Indigenous Plants for Health and Wellness, Adlai, Rubber, Biofuels; and four new programs: Rainfed Agriculture, Apiculture/Beekeeping, Soybean, and Breadfruit/Rimas.

For the new RDE programs, the bureau facilitated the crafting and mapping of



the development roadmaps and setting the agenda for prioritizing funding support.

For the Soybean RDE Program, BAR with other implementing agencies crafted the Philippine Soybean Roadmap for 2010-2014 titled, "Building Sustainable Soybean in the Philippines," which hoped to establish a sustainable soybean industry in the Philippines. To do this, the program aimed to establish knowledge-based and farmer friendly research facilities for soybean production and development in strategic production areas in the country, and build strong partnership with private sector for the processing and marketing of soy-based products in local and international markets.

Another emerging industry with great economic potential is the Apiculture or Beekeeping, which BAR intensified in 2011. BAR met with major players and stakeholders and crafted the Bee Industry Roadmap which was followed through by a workshop-writeshop to harmonize with the R&D and commercialization components. The program aims not only to boost the apiculture industry in the country but also to generate livelihood given the high demand for the production of valuable products from bees including, honey, pollen, beeswax, and propolis.

BAR was also given the task to initiate the crafting and finalizing of the Philippine Rainfed Agriculture Research, Development, and Extension Program (PhiRARDEP). The program is in close collaboration with the India-based, International Crops Research Institute for Semi-Arid Tropics (ICRISAT) and the DA-

High Value Crops Development Program, (HVCDP) for funding. The program hoped to develop, coordinate, monitor and evaluate the implementation of a vigorous agriculture RDE program to enhance food, nutrition and energy security, to improve livelihoods, and to empower communities in the country's rainfed areas. In 2011, there were 11 newly-funded projects under the rainfed farming systems innovation component of the program.

The latest RDE program is on Breadfruit or Rimas, which is being promoted as a potential food staple crop along with corn grits, *saba*, *adlai*, sweet potato, and cassava. This program is in sync with DA's Food Self-Sufficiency Program which hopes to provide options for Filipino consumers on what to serve on their table other than rice. In 2011, BAR organized a consultation workshop for the drafting of Breadfruit Development Program/Roadmap. The activity was held in partnership with DA-HVCDP.

Along with these programs, BAR continues to implement and provide support to the community by boosting R&D manpower (Human Resource Development Program), strengthening institutional R&D capacity (R&D Facilities Development Program), and effectively managing knowledge generated from R&D (Knowledge Products and Services Program).

Bringing R&D generated results closer to people, BAR extends its services to clients through the: R&D Technology Commercialization Center

(TechCom Center), Scientific Literature System (SLS), and Intellectual Property Rights Management (IPRM). The TechCom Center showcases technologies ready for adoption while the SLS provides information, knowledge on BAR-funded researches and those conducted by the institutions from the National Research and Development System for Agriculture and Fisheries (NaRDSAF). The IPRM provides IP assistance not only for BAR funded research outputs but also to other public and private institutions. The assistance provided comes in many forms from very simple provision of information to as complicated as drafting claims.

Part of the growing functions of BAR is the institutionalization of two of its major activities, the Agriculture and Fisheries Technology Forum & Product Exhibition every August and the National Research Symposium every October. These activities served as the bureau's outlets to keep the clients aware of the significant technologies generated from R&D.

So far, many has been accomplished, yet there are more that needs to be done. What we have accomplished in 2011 are results of collaborations and partnerships that would have not effectively worked without the cooperation of key players and stakeholders. We hope to continue what we have started and set the platform for success!


DR. NICOMEDES ELEAZAR, CESO IV
Director

R&D PROGRAMS



Banner Programs



Part of the continuing efforts of BAR, as the national coordinating body for the national agriculture and fisheries R&D of the country, is reaching out to broad and specific segments of the R&D community. Conscious of its obligation to harness the full potentials of R&D for the benefit of society and people, BAR intensifies its funding support in implementing programs that will create great impact to the farming and fishing

communities.

BAR's response to global competitiveness, poverty alleviation and people empowerment is anchored on its dynamic and responsive banner programs. These are: the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP).

CPAR

Community-based Participatory Action Research Program



Since the start of the CPAR implementation, the program has been providing livelihood and entrepreneurial opportunities to its project beneficiaries particularly the marginalized sector of the country, farmers and fishfolk. Moreover, through the CPAR implementation, the need for a comprehensive platform on community-based farming system has been established through this approach.

CPAR recognizes the importance of community participation in midstream and more importantly in the downstream research which focused more on technology verification, adaptation, demonstration, and dissemination. It involves extension and transfer of technologies needed by the community. CPAR's participatory nature is committed to give attention to a holistic orientation to the overall management of production system of the farmers and the communities in general.

For 2011, 205 CPAR projects were implemented covering 502 sites nationwide and benefiting 10,037 farmers. Compared to the 176 CPAR projects implemented in 2010, there is a 16 percent increase and a 14 percent increase in beneficiaries from last year's 8,794 farmers and fisherfolk who benefitted from the projects.

Included in the 10,037 beneficiaries were 5,387 farmer-cooperators and 4,650 adopters. Adopters are the indirect beneficiaries of the CPAR projects which included farmers who adopted the technology with potential for commercialization.

Furthermore, from the 205 CPAR projects that were funded and implemented, 177 are on agriculture, while the remaining 28 are on fisheries and fishery-related projects.

CPAR projects implemented for five years (2007-2011), have increased both in the number of sites and farmer beneficiaries (*Figures 1 and 2*). The increasing trend denotes positively as it showed that not only CPAR covers more areas nationwide but reaches more beneficiaries in terms of improved production and increased income.



Figure 1. CPAR projects and CPAR sites implemented from 2007 to 2011.

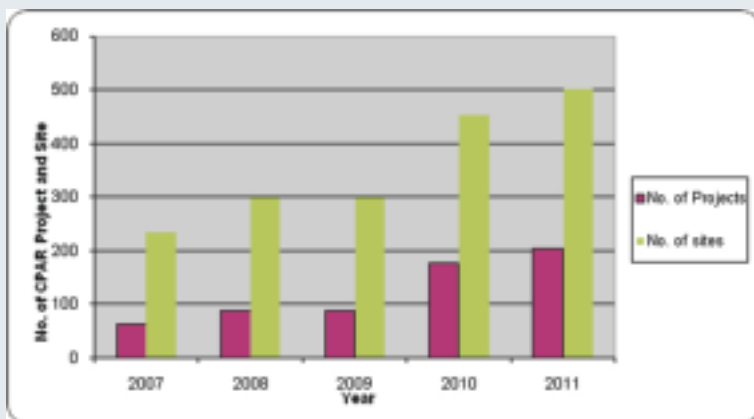
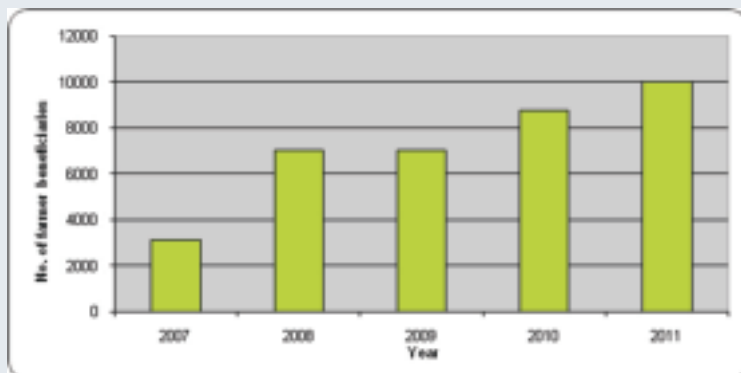


Figure 2. CPAR farmer beneficiaries from 2007 to 2011.



Spearheading the CPAR projects is the Project Monitoring and Evaluation Division (PMED) that coordinates, monitors, and evaluates the implementation of agriculture and fisheries R&D/E activities under the national/regional R&D/E networks agenda and programs. PMED establishes and strengthens these linkages among existing R&D/E systems.

In 2011, PMED in collaboration with other divisions, coordinated and monitored 328 on-going projects, including: 92 SUCs, 192 RFUs, 14 DA attached agencies and staff bureaus, 19 LGUs, 6 NGOs and private sectors, and 5 others.

Furthermore, BAR projects were also monitored including: 105 on-going projects, 19 research facilities, and 2 foreign-assisted projects. During this period, PMED also coordinated the conduct of 5 semi-annual reviews, 107 annual reviews, and 37 terminal reviews. Five projects were reviewed during the semi-annual review, 57 projects during the annual review, and 37 during the terminal review.

CPAR Success Stories



Zeroing in on farmer strategies and resource allocation, as well as biophysical and socio-economic characteristics under which the farm household operates, CPAR introduces technologies and interventions that teach farmers how to apply effective total farm productivity within the context of a sustainable production and farming system approach.

Farmers are able to maximize the use of their lands and ensure available and affordable food for the family through the integration of high value crops, vegetables and livestock productions in the farming system.

1 Corn-based Integrated Farming Systems: An Approach to Rural Enterprise Building

(Brgys. Tacub Pindolonan, Cawayan Linuk, Camalig Bubong, in Marantao, Lanao Del Sur)

An increase in corn yield from 1.84 tons/ha to 2.85 tons/ha with corresponding increase of P 4, 729.00 in income for every farmer cooperator. For vegetables, the yield increased from 177.5kg to 246 kg with a corresponding increase in income amounting to P1,342.00. Sales from chicken also increased the farmer cooperator's income by P1,141.00. The overall increase in income of farmer cooperators took place when CPAR was introduced in their barangays amounting to P7,212.00.

2 Corn-based Farming Systems in Libona, Bukidnon

(Brgys. Gango and Kinawe in Libona, Bukidnon)

The farmer cooperators were able to repay 100 percent (in kind) the revolving fund provided by CPAR to the association. There was an increase in net income of farmer cooperators due to the increased in yield production and the high buying price of corn during the implementation period. Mr. Pedencio Melallos of Brgy Kinawe, one of the 10 farmer partners, adopted the technologies introduced by CPAR in his 3.7 ha farming area. Integrated in his farm to serve as supplementary income source were pig pens, mangoes, cassava, and vermiculture. The harvested cassava crops were sold in the local market while the rejects were utilized as hog feed. Corn cobs were used as feed for the vermi worms.

3 Cassava-based Farming System in the Province of Sulu

(Brgys. Adjid, Buansa and Tagbak, Indanan in Jolo, Sulu)

There were significant increase in yields of cassava, corn, eggplant, and peanut in Brgy. Ajid, with the introduction of improved technology generated from DA-ARMMIARC. This was supported with series of trainings on IPM, seed production, and improved management practices on vegetables. The farmer cooperators produced good harvest and seeds for their succeeding cropping seasons. Through the project, Jolo as the lead mangosteen producing province in ARMM, was able to put more value on their excess harvests by processing them. Another component of the project that increased farmers' incomes was the rearing of free range chicken for meat and eggs. Other barangays received cattle as draft animal. The initial (three) cattle provided to some of the farmer cooperators already produced offsprings which were provided to other farmer cooperators. Regular monitoring of the animal health was provided by the implementing units to assure the project sustainability of accountability of farmer cooperators.

5 Crop-Legume-Livestock Integrated Farming System in Annanuman, San Pablo, Isabela

(Brgy. Annanuman in San Pablo, Isabela)

There was an increase in the number of farmer adopters from 5 to 25. Roll-over scheme was followed either by obtaining the first cash from selling the animal/vegetables or transferring the seeds of vegetables and offspring of the animals to the succeeding adopters. Disease infestation in the poultry and ruminants raised were also insignificant while mortality was offset by the number of offspring produced which in turn, was transferred to another farmer. Farmers were also gradually shifting from conventional farming to organic agriculture due to high cost of inorganic fertilizer and other oil-based inputs. Vermicomposting served as another source of income as well as source of additional fertilizer in the area.

4 Improved Arrowroot Production Technologies under Coco-based Farming Systems, Enhancement of the Existing "Uraro"-based Products and Development of New Product Lines in Catanauan, Quezon

(Brgys. Matandang Sabang-Silangan and Matandang Sabang-Kanluran in Catanauan, Quezon)

Results showed that application of the package of technology (POT) improved the production of tubers from 4 to 8.37 tons/ha in MSK and 15.20 tons/ha in MSS, and increased the generation of starch in both areas. Tuber processing was improved through the machines developed by the Bicol University (BU). Tubers, starch, and flour were characterized and evaluated. The generated products were organically grown. The farmer organizations in the research sites were reactivated, registered, and accredited. Promotional activities were conducted. Institutionalization activities and sustainability mechanisms were instituted. After two years, the farmers' income increased with ROI of 14.27 percent and 55.36 percent for MSK and MSS, respectively. Adopters also increased with improvements on selected indicators.



6 CPAR on Fishpond Tilapia Production and Processing in Lamut, Ifugao (Brgys. Hapid and Sanafe in Lamut, Ifugao)

Field monitoring of fish ponds in the area was done and it was found that the fish ponds of farmer cooperators of the CPAR project were not affected by the fish kill that occurred in the past year. This was due to the fish farming technologies introduced and implemented through the CPAR. The adopted technologies have been providing aid in fish farming procedures including fingerling stocking, feeding, and harvesting. CPAR farmer cooperators continue to benefit from the knowledge and technologies they acquired in the past two years.

7 Promoting Upland Resource Management and Increasing Farmer's Income in Rubber-based Farming System at Mahayag, Zamboanga del Sur (Brgy. Calabasa, in Curuan District, Zamboanga City)



Farmer-cooperators were able to establish the rubber-based farming system technology in all project sites. While waiting for the latex production farmers generated income through the cash crops. Vicente Casas, Jr., one of the farmer cooperators, used corn as a cash crop and was able to harvest two sacks for consumption. Edwin Espinosa used sweet potato and rice as cash crop and was able to harvest 300 kg of sweet potato generating P3,000.00. He also harvested 13 sacks of rice for consumption. Jorge

Braza harvested 800 kg of sweet potato and 500 kg of corn generating P6,000.00 and P8,000.00, respectively. Farmers also generated income from banana, which served as an intercrop in the farming system. Mr. Edwin Espinosa harvested 200 kg of banana and generated P600.00 from it. Apart from this, farmer adoptors have increased in number.

8 Cassava Chips Processing in Barangay Naparaan and Malbog, Salcedo, Eastern Samar (Brgys. Naparaan and Malbog in Salcedo, Eastern Samar)



This project was recommended for commercialization by evaluators during the CPAR review. Production of cassava was spearheaded by men while the processing activities were spearheaded by women. Majority of the members had undergone training on production, processing of chips, flavoring and product packaging. Cassava chips were sold in the local market and individual stores. The group produced IEC materials on cassava chips production and processing with the assistance from the Visayas State University (VSU). VSU also provided cassava chipper to support the processing activities of this project. This project has created a good market demand and has been receiving continuous cassava chips orders. The group also established good market linkage with cassava chips retailers, local stores, and individual households.

9 **EVIARC Sweet Jackfruit Production and Processing in Barangays San Isidro and Malinao, Mahaplag, Leyte**

(Brgys. San Isidro and Malinao in Mahaplag, Leyte)



This project was also recommended for commercialization by evaluators during the CPAR review. Production of jackfruit is now expanding in other barangays. There were 40 farmers who have undergone season-long training on integrated nutrient management (INM) and integrated pest management (IPM). The project was able to establish one jackfruit scion grove and one plant nursery. The group is now planning to produce organic jackfruit.

11 **Seaweed Culture in Panobolon, Nueva Valencia, Guimaras**

(Brgy. Panobolon in Nueva Valencia, Guimaras)

Aside from selling seaweeds, the group established smallscale salt making IGP during off-season of seaweeds and used part of their sales to buy for their basic needs and school expenses for their children. The group generated an income of P15,000 and was able to procure one pumboat and one solar panel. The pumpboat was used for regular monitoring, use to ferry school children to the school, used for marketing and transporting of their seaweed produce to the local market. The solar panel on the other hand is now being used to generate electricity need of the residents of Panobolon.

10 **Corn-based Farming System in Brgy. Ngarag, Cabagan, Isabela**

(Brgy. Ngarag in Cabagan, Isabela)



Average yield of corn increased from 2,400 kgs/year to 5,880 kgs/yr. Overall average income increased from P25,200/yr to P49,353/yr and increase of 195 percent. Due to the success of the project, neighboring farmers began to adopt technologies being implemented by farmer cooperators. More than 30 farmers from neighboring farms have adopted.



NTCP

National Technology Commercialization Program

The NTCP complements the CPAR program as it serves as the entry point for commercializing the technologies which were developed during on-farm technology demonstrations and field trials.

R&D breakthroughs and mature technologies that are ready for adoption are supported in the promotion of NTCP as a program of BAR. Attention is likewise given to the strengthening of a market-driven approach for holistic and integrated development.



For 2011, BAR has been funding 122 NTCP projects (88 new and 34 on-going). From the 122, 72 were approved under the Regular/AFMA, 41 under the HVCDP, and 9 under the NAFC-2KR. (Figure 3) There was a huge increase in the new

NTCP projects funded, from the 13 funded in 2010. The increase was a result of the augmented budget allocation of the government in view of intensifying and strengthening R&D initiatives that will provide great impact at the grassroots level.

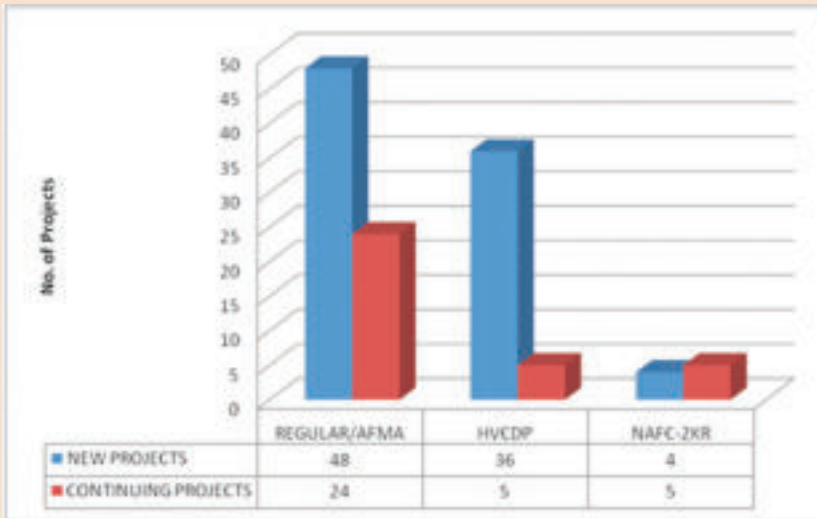


Figure 3. Distribution of projects coordinated by BAR, through TCD

In coordinating NTCP projects, BAR is working hand-in-hand with other DA agencies and research centers, SUCs, LGUs, NGOs, private sector, and other international research organizations. In doing so, BAR was involved in the planning/crafting of various commodity/industry-focused roadmaps for soybean, coffee, cacao, beekeeping, and rimas as well as the funding of projects under these priority areas.



TCD coordinated the creation of the proposed National Algae R&D Program for High Value Products through the conduct of a series of meetings with industry experts. Pool of experts came from UP-Marine Science Institute, Ateneo de Manila University, UP Visayas- College of Fisheries and Ocean Sciences, and UPLB wherein they have to come up with a three-year program on algae R&D. The proposed program includes studies on algae biology, mass production/cultivation, and on extraction and isolation of high value products. The program will explore potentially available marine and fresh water macroalgae and microalgae in the country.



One international project coordinated by BAR is the AFACI New Pan-Asian project titled, “*Integrated Management System of Plant Genetic Resources*”. This is supported by the Rural Development Cooperation, Republic of Korea. The objective of this project is to enable members of the AFACI to jointly address the global issues in genetic resource conservation and to strengthen their network in this aspect.

NTCP Success Stories



To successfully implement NTCP, BAR is working hand-in-hand with scientists, researchers, extension workers, LGUs, SUCs, credit and financial institutions, and policymakers. Over the years, NTCP is able to reach intended beneficiaries including farmers and fisherfolk, processors, consumers, communities, and various industries.

Encouraging new business opportunities and accelerating the adoption of modern production and processing technologies, NTCP hopes to expand markets for agriculture and fisheries products.

1 Promoting nutri-based products from sweet sorghum and pigeonpea

The Vulauan ta Barangay, (VTB-Moldero) in Barangay Moldero, Tumauni, Isabela, is a successful women organization which proved that there is profit from sweet sorghum and pigeonpea. VTB-Moldera is now engaged in processing food and other sweet sorghum and pigeonpea based nutri-products through a project titled, “Development Utilization and Commercialization of Sweet Sorghum and Pigeonpea Nutri-based Products”. This is assisted by the Isabela State University (ISU), Cagayan, Isabela, in collaboration with the LGU of Tumauni.

The project aims to promote sustainable production of sweet sorghum and develop viable food and



by-products to increase livelihood opportunities and farm income in the rural areas. "Grains were produced and utilized as flour to supplement cookies/bread making while the extracted juice serves as based material for vinegar & basi wine. Special buko pie and cassava cake are produced using sorghum syrup as sweetener," said Prof. Raul Palaje, project leader. In less than a year, VTB was able to pay back their loan amounting to P20, 000 which they used as starting capital. They generated an income of more than P13,000 during the first five months of operation. To date, the organization invested in fruit wine-making sweetened with sorghum juice. The project generated small employment for the members who provided labors in the production of baked products and by-products. Other members who participated in selling the products also received 10 percent incentives from the total profit.

The women organization, with 15 members, produces their raw materials for food products. The members with available land were required to plant sorghum on a 5-7 rows 25 meters long integrated in their corn plantation equivalent to about 200 sq. m area per member. The VTB Moldero has been serving as resource person or trainers in the dissemination and promotion of sorghum technology to other women sector of nearby towns and barangay.

2 Promoting spaghetti and leche flan from seaweeds



The Bureau of Fisheries and Aquatic Resources-Regional Fisheries Research and Development Center 5 (BFAR-RFRDC) has turned seaweed into extraordinary dishes - literally, twists on your favorite snack and dessert. Seaweed spaghetti and leche flan from seaweeds are culinary preparations that would definitely soothe your taste buds. These were showcased during the 7th Agriculture and Fisheries Technology Forum and Product Exhibition. RFRDC Manager Aida Andayog and her staff held a technology demonstration on how to prepare the dishes.

Seaweeds are endemic to marine waters. Local varieties are variously known as "gulaman dagat", "guso" or "tambalang". Based on the presentation, seaweeds are a valuable and nutritive product. In human nutrition, seaweed can help build and sustain the broad nutritional requirements and balance of vitamins, minerals and vital nutrients on which optimum health and vitality depends.

According to Ms. Andayog, seaweeds are low-calorie foods with easily digestible sugars and fats. Seaweeds are a source of minerals, essential fatty acids, nucleic acids like RNA & DNA, and phytochemicals such as carotenoids, protein and fiber. She added that value-added products from seaweeds are easy to prepare, cook and eat. Delicious and nutritious recipes are readily available and are affordable.

Seaweed spaghetti and leche flan can give you a return on investment of 35.48 percent and 26.50 percent, respectively.

The development of these products was integrated in the project, "Product Development/Improvement and Commercialization of Seaweeds in Bicol Region". Funded by the Bureau of Agricultural Research, the project aims to standardize and commercialize seaweeds and processed seaweed products for market competitiveness.

Other seaweed-based processed products that have been developed by BFAR-RFRDC were: *morcon*, chocolate bar, juice, jam, *lumpia*, *longanisa*, tart, and *yema*, among others.

3 Commercializing seed production of hybrid squash

Squash is a vitamin-rich vegetable particularly Vitamins A, B, and C. It also has antioxidant, anti-inflammatory and anti-cancer properties and is rich in fiber. In the Philippines, squash or *kalabasa* is the best known member of the squash group of vegetables.

But more than its nutritional benefits, this vegetable crop can significantly increase farmers' incomes. This was proven by a two-year research study titled, "Commercializing and Integrating Squash Hybrid Seed Production Technology into the Cropping Systems of Sto. Niño, Cagayan," that was conducted by the Farmers' Community Development Foundation, International (FCDF). The research study sought to determine the viability of shifting from the traditional corn-corn cropping pattern to corn-squash hybrid seed production system.

The introduction of squash hybrid seed production was meant to show the profitability of changing the traditional corn-corn pattern to corn-squash hybrid seed production pattern and, ultimately, encourage the local farmers to shift to the new farming practice. The ultimate goal of the project is to improve the income and living conditions of the poor farmers and their families in the area.

The practice of having squash as the second crop was introduced to 117 farmers and covered about 50 hectares of river-flooded plains and corn-based farms in nine barangays of the Municipality of Sto. Niño. It came as no surprise that all the farmer-cooperators planted the recommended parental lines for squash hybrid seed production.

Project results were positive. It showed that, with the corn-squash cropping pattern, 20 percent increase in gross revenue, as compared with the corn-corn pattern, can be achieved. "Production costs and returns showed that the average gross return from squash hybrid seed production alone was PhP60,830 bringing the total gross revenue of the combined corn-squash hybrid seed production pattern to PhP107,510," said Dr. Ponciano Batugal, project leader.

Total variable costs increased to 9.5 percent while the gross profit margin rose to 42.5 percent. The marginal benefit-cost ratio (MBCR) of the new pattern is 3.1. The high MBCR indicates that adopting the new cropping pattern is not only profitable but also meets the benefit-cost requirement of new technologies to account for the risk factor.

The participating corn farmers produced an average yield of 121.66 kg squash seeds/ha and received a guaranteed seed price of PhP 500/kg. Farmers could also use the squash flesh after seed extraction for food or feed.





4 Processing the sweet and sealed canned tuna and bangus French style

Commercial companies are now processing regular tuna in can with added flavor that suits Filipino dishes. For the local counterparts, the Mindoro State College of Agriculture and Technology (MinSCAT), Bongabong Campus has developed canned products with tuna and bangus in French style. This was developed through a funded project, *“Commercialization of Some Fishery Products (Canned Tuna in Oil and Bangus French Style) through Improved Packaging and Labeling.*

Started mainly as an instructional material for students, the said campus now produces canned products such as tuna in oil, and bangus french style. “MinSCAT continuously engages in different fish processing practices to include canning of different species of fish,” said Dr. Edna G. Piol, campus administrator.

These products have already gained popularity, thus the demands have gradually increased. These products are sold not only in the different places in the province but also outside the country.

The financial assistance provided by BAR is used not only for production purposes but also for the transfer of technology to the community members to provide alternative source of livelihood and to increase food production in the province of Oriental Mindoro in particular and in the country in general.

The fish canning industry in MinSCAT has an advantage in terms of its quality, sanitary standards of preparation, and unique palatability of canned products processed in the college. “Widespread promotion of these products will highly contribute in bringing the tuna in oil and bangus in French style closer and popular to the market.



Other Programs



R&D is the primary mover for constituting new initiatives in 2011. Keeping in pace with what the past years required, providing immediate answers and solutions and predicting what the future needs, make R&D always on its toes.

In sync with the priority programs of DA, BAR continued its support through multi-sectoral collaborations and partnerships as reflected in the number of funded projects and their beneficiaries. In 2011, BAR led the RDE component of the following new programs and priority commodities:



Organic Agriculture

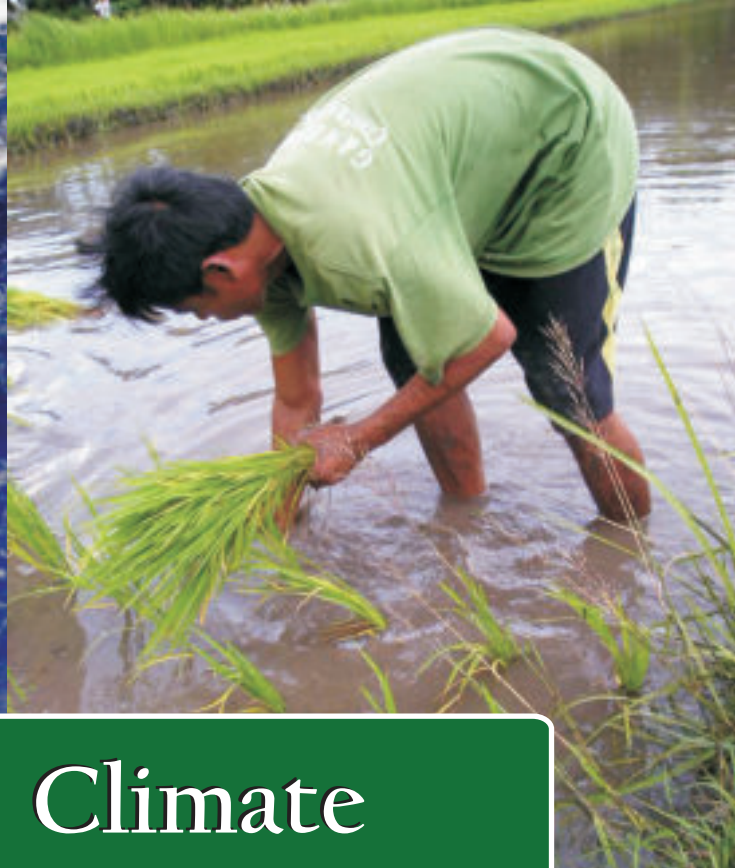
Organic Agriculture (OA) remains an unexplored and underutilized sector in the country. It is not until the enactment of RA 10068 that OA gained a stature and priority in national development agenda, thus, providing another significant step towards the country's goal of achieving sustainable agriculture. The RA 10068, also known as the “Organic Agriculture Act of 2010,” brings a comprehensive approach and strategies on how to tackle, develop, promote and sustain the practice of organic agriculture in the country.

BAR has been tasked to “lead and coordinate among executive agencies of the government to develop, enhance, and support and consolidate activities for formulation and implementation of unified and integrated organic agriculture RDE plans and programs from the national down to the field level.”

To equip various stakeholders with appropriate technical knowledge and to use this on

conceptualizing and implementing R&D projects, BAR conducted the “Workshop on Planning and Project Proposal Preparation on Organic Agriculture R&D 2011 – 2016 on 21 – 23 September 2011. More than 100 participants from RFUs, RFRDCs, SUCs, DA attached agencies and staff bureaus attended the event. The outputs of the workshop were concept notes and capsule proposals on OA from the participating institutions.

Another output of the workshop, which underwent a series of consultations and seminar-workshops, was the finalized OA R&D Action Agenda, under the DA National Organic Agriculture Program. The agenda is divided according to following sectors: 1) crops, 2) livestock and poultry, and 3) fisheries. The action agenda contained a detailed plan of R&D strategic directions as well as the implementing mechanisms needed to be undertaken with considerations on the diverse priority R&D needs of various stakeholders.



Climate Change

Aware of how the world looks at climate change as an enormous challenge. Among other impacts, climate change will fundamentally affect agricultural productivity. The Philippines, along with the world's poor countries, is least responsible for global warming, yet it suffers from the impacts of climate change.

The challenge in the R&D sector is to have consensus or a common scope on climate change mitigation and adaptation policies to be integrated into its national development programs. Although climate change is still considered marginal compared to poverty alleviation and economic growth, there is a great opportunity to improve the linkage between climate variability and development. There is a need to strengthen R&D activities that will specifically focus on mitigating climate change and improve the adaptive capacity of our farmers and fisherfolk to better equip them with the challenge.

BAR, as the focal of R&D of DA, together with UPLB, UP Diliman, DOST-PAGASA, SEARCA, and DA-BSWM, convened for mapping out the Climate

Change Research, Development, and Extension Agenda and Program (RDEAP) for the medium term. The program aims to generate technologies for adaptation and mitigation of climate change and improve the adaptive capacity of farmers and fisherfolk by providing relevant technologies and information.

The Climate Change RDEAP is composed of four components: 1) short-term adaptation strategies, 2) long-term adaptation strategies, 3) other adaptation strategies following the DA Policy and Implementation on Climate Change (DA-PICC), and 4) mitigation strategies.

BAR partnered with experts from UPLB to conduct the DA-BAR Climate Change R&D Agenda Review and Planning Workshop held on 22 – 25 June 2011. The workshop's agenda included: 1) revisit and review previous crafted plans and programs; 2) update with the current, relevant emerging issues on climate change and incorporate them into the current program and; 3) finalize the Climate Change RDEAP and package it into a useful reference material to be distributed to partner institutions and stakeholders.



Biotechnology

Biotechnology remains a competent tool to address the needs and challenges of today's society. With its diverse applications and innovative approach to solve the most intricate puzzle of the modern world, agriculture R&D sees the relevance of biotechnology as an instrument to aid in boosting food production and help alleviating poverty.

Together with the DA-Biotechnology Project Implementation Unit (PIU), BAR has been funding biotechnology R&D projects and related activities of the different agencies of the government, SUCs, LGUs, among others. With funding support from BAR, efforts of various implementing agencies were geared in promoting the adoption of new production and technologies to achieve food security and productivity in agriculture and fisheries sectors.

On 30-31 May 2011, BAR participated in the mid-year review of DA-Biotech Program-funded projects. Nineteen on-going projects including 15 applied biotechnology research (ABR), 3 institutional capability enhancements (ICE), and 1 on information education and communication (IEC) were evaluated by the technical experts. On the other hand, seven biotech proposals (1 ICE and 6 ABR) for possible funding were also presented.

Also highlighting the two-day activity was a conduct of orientation-workshop on proposal and report submission, and evaluation on biotech projects using the updated and improved Electronic, Submission, Monitoring and Evaluation System (ESMES) which was developed by the DA-BIOTECH PIU. This was devised to have an efficient way of monitoring the projects with the use of modern technology.



Biofuels

With the enactment into law of R.A. 9367, otherwise known as Biofuels Act of 2006, agricultural crops such as corn, soybeans, cassava, sugarcane, coconut, jatropha, and sweet sorghum were being utilized to answer the call to develop, produce, and distribute high-quality, reasonably-priced and environment-friendly alternative fuels.

BAR, as the focal agency for DA's Biofuels Program, commissioned various R&D initiatives and adaptability trials for these crops throughout the country.

Based on research results, that among the various biofuel crops tested, sweet sorghum turned out to be the most advantageous feedstock for bioethanol production in the Philippines in terms of production, economic, and environment factors. Sweet sorghum reached several areas like Ilocos, Cagayan Valley, Cordilleras, Central Luzon, and some provinces in the Visayas and Mindanao.

BAR, through TCD, and other implementing agencies (UPLB, and MMSU), reinvigorated interest in sweet sorghum as viable feedstock through the project/trial and the “1st Sweet Sorghum Business Summit” held on 2 June 2011 in Bacolod City. This is in partnership with the Asia's largest Asia ethanol plant, San Carlos Bio Energy, Inc.

The “1st Sweet Sorghum Business Summit” encouraged the setting-up of a similar event for industry stakeholders in Northern Luzon who expressed interest in collaboration with BAR. This BAR initiative also got the attention of the Philippine National Oil Company Alternative Fuels Corporation (PNOC) to invest in sweet sorghum instead of jatropha. Sweet sorghum was also mainstreamed as commodity crop under the DA-HVCDP.

For 2011, seven new projects were funded under the biofuels program.



Rainfed Agriculture

For the past years, majority of R&D interventions were concentrated to areas with much more favorable farming conditions, thus, neglecting areas which really needs support and R&D investments. Rainfed and dryland areas occupy three-fourths of the 10 million hectare of total cultivated area in the country. Despite the lack of due attention, it constitutes to about 40 percent of the total food production in the country. Improving the existing rainfed-farming system and practices and giving appropriate interventions for these areas could contribute significantly to the economic growth, food security, and livelihood opportunities.

BAR, as the focal R&D coordinating body of DA, was given the task to initiate the crafting and finalizing of the Philippine Rainfed Agriculture Research, Development, and Extension Program (PhiRARDEP). The program is in close collaboration with the India-based,

International Crops Research Institute for Semi-Arid Tropics (ICRISAT) and the DA-High Value Crops Development Program, (HVCDP) for funding.

The overall goal of PhiRARDEP is to develop, coordinate, monitor and evaluate the implementation of a vigorous agriculture RDE program to enhance food, nutrition and energy security, to improve livelihoods, and to empower communities in the country's rainfed areas. PhiRARDEP will zoom in into four major concerned areas which are: 1) rainfed farming systems innovation; 2) participatory watershed management; 3) strategic social science and policy research and; 4) capacity building, communication and social mobilization.

Prior to the launching of the program, a National Philippine Rainfed RD&E Consultation Workshop was held on 27-29 April 2011. This was attended by more than 100 participants including officials and staff from the DA's national and

regional offices, RIARCs, staff bureaus and attached agencies, selected SUCs, NGOs/CSOs and ICRISAT. As an output, a unified RDE Agenda and Program (RDEAP) for rainfed agriculture was mapped out. This specifies policy frameworks and institutional strategies which will be used as a basis in prioritizing and funding specific projects.

To review, validate, and refine the outputs from the consultation workshop, a Roundtable Consultation Meeting to Finalize and Prioritize the PhiRARDEP Action Agenda was held on 25 – 27 May 2011. This was a small-consultation meeting with selected experts from CLSU, MMSU, UPLB, BSWM, and BAR staff. The concurred output was a list of specific researchable areas of which will be funded and implemented under PhiRARDEP.



Photos during the PhiRARDEP Consultation Workshop held on 27-29 April 2011 in Tagaytay City and PhiRARDEP Roundtable Consultation Meeting on 26-27 May 2011 also in Tagaytay City.

Philippine Rainfed Agriculture RDE Consultation Workshop

Hotel Vida, Clark, Pampanga
27-29 April 2011

In 2011, there were 11 newly-funded projects under the rainfed farming systems innovation component of the program (Table 1).

Table 1. Projects funded under the component 1 (rainfed farming systems innovation) of PhiRARDEP.

TITLE OF THE PROJECT	AGENCY	APPROVED DURATION
1. CPAR on Rainfed Rice based Farming System in Dumarao Capiz	DA-RFU VI WESVIARC	2 years
2. Improving Water and Land Productivity Through Technology Integration in the Uplands	BASC	18 months
3. Climate Change Adaptation Strategies for Agriculture in Community Watersheds of Cagayan River Basin	ISU	3 years
4. Aerobic Rice Production System: Improving Productivity in Water Scarce Areas of Cagayan Valley	ISU	2 years
5. Converging Indigenous Knowledge System and S & T in Rainfed Areas: An Approach for Sustainable Farming System in Region XII	SKSU	3 years
6. Adaptability Trial of Upland Rice Varieties Under Davao City Condition	DA RFU XI SMIARC	2 years
7. CPAR on Rice-Based Integrated Farming System (Rice-Rice+Corn+Sweet Potato+Vegetables+Swine) in Rainfed Areas in the Province of Aklan	DA-RFU VI WESVIARC	2 years
8. CPAR on Promoting Upland Resource Management and Increasing Farmer's Income in Rubber-Based Farming System at Mahayag, Zamboanga del Sur	DA RFU IX- WESMIARC	2 years
9. CPAR on Promoting Upland Resource Management and Increasing Farmer's Income in Rubber-Based Farming System at Zamboanga City	DA RFU IX- WESMIARC	2 years
10. Community-Based Participatory Action Research (CPAR) - Upland Vegetable Based Production Project in Maragusan, Comval Province	DA RFU XI- SMIARC	2 year
11. CPAR on Organic Vegetable Production in Rainfed Rice Farming Areas in Barangays Bactul, Tutumoy and Libhu, Maasin, Southern Leyte	DA RFU VIII- EVIARC	2 years



Breadfruit

Looking into the trend of rice productivity and rice consumption of Filipinos, a great discrepancy showed that the country's rice supply overcame its demand.

The government has been trying to look for viable strategies to increase rice production and provide options for Filipino consumers on what to serve on their table aside from rice. Hence, DA launched the Food Staples Sufficiency Program which aimed to promote alternative food staple crops. Among the food staple crops being promoted by DA are white corn grits, *saba*, *adlai*, sweet potato, and cassava.

Locally known as *rimas* (*Artocarpus altilis*), breadfruit is the latest addition among the staple food crops that DA is promoting. When cooked, breadfruit exhibits a potato-like flavor as that of freshly baked bread. *Rimas* belongs to the family of

mulberry (*Moraceae*) including *langka* and *marang*. Studies on *rimas* revealed that it is high in carbohydrate and energy content, making breadfruit a potential staple commodity which could be eaten as an alternative to rice, wheat, flour, and feed.

To further explore its potentials as a staple food crop, a consultation-workshop was held for the drafting of Breadfruit Development Program/Roadmap on 26 September 2011. The activity was held in partnership with DA-HVCDP. Setting the benchmark database, identifying the priority R&D interventions and the corresponding set of action plans were the consorted outputs crafted during the workshop.

During the last quarter of 2011, RDE project proposals on breadfruit had already been submitted to BAR for evaluation and funding support.



Indigenous Plants

Launched in 2007, the Indigenous Plants for Health and Wellness (IPHW) program is DA's response to Proclamation No. 1280 declaring the month of October and every year thereafter as the National Health and Wellness Tourism Month.

With the increasing consciousness of Filipinos with regard to their health and wellness, natural, safe, and disease-preventive products are now in great demand in the market.

The IPHW program is a joint venture of BAR, UPLB, and BPI which aims to explore the potentials of underutilized indigenous plants as functional food, herbal medicine, and raw material for nutraceuticals, pharmaceutical, and cosmeceutical products for promotion and commercialization.

RDE project for herbs and spices

A project funded under NTCP was the “Production, Processing, and Marketing of Herbs and Spices” implemented by the Southern Luzon State University – Judge Guillermo Eleazar (SLSU-JGE) which is based in Tagkawayan, Quezon. To solidify the implementation of the project, BAR Director Nicomedes Eleazar and SLSU-JGE College Administrator Cesar Nazareno signed a Memorandum of Agreement (MOA) on 17 June 2011. The project aimed to explore the potentials of herbs and spices as an agribusiness enterprise. The same project was being implemented by the University of Southern Mindanao (USM).



Package of Technology (POT) for Stevia

Funded under the NTCP, a project titled, “Commercialization of *Stevia rebaudiana*: A Natural Sweetener” is nearly completed. The project is being implemented by the Bicolandia Greenfields Development Organization, Inc (BIGFIS), a non-government organization based in Naga City. BIGFIS hopes to slowly penetrate the sweetener industry, which is dominated by sugar. Specifically, the project aims to develop a POT on *Stevia* by developing its nursery production under organic conditions. This will provide planting materials for farmer-cooperators and at the same time, instill to them the value of Good Agricultural Practices (GAP).

The phase 2 of the project is now under review and evaluation for funding. Once approved, the project will focus on commercialization, promotion, and transfer of technology on the organic production of *Stevia*.

Tapping the potentials of public-private partnership



Two private organizations: *Weaves of Asia* (WOA) and *Gandang Kalikasan, Inc.*, (GK Inc.) are looking into possible collaborations with BAR.

WOA is a private company engaged in supplying hotel amenities to the different hotels in the country. In 2011, WOA approached BAR for possible assistance that it could extend to farmer-cooperators who are producing the raw materials extracted from tomato, turnip, papaya, watermelon, carrot, and cucumber.

GK Inc., on the other hand, is engaged in buying extracts such as essential oils, waxes, and juices from sunflower, citronella, lemongrass, peppermint, aloe vera, bees wax, avocado, among others. It tapped BAR in looking for potential farmer-cooperators which they would contract out for the production of raw materials especially the sunflower oil. It also looked into the possibility for funding support from BAR in research, production, and capacity-building activities on sunflower oil production.





Soybean

To build a sustainable soybean industry in the Philippines, DA created a Technical Working Group (TWG) for the Development of Soybean Roadmap in the Philippines, through a Special Order No. 7. BAR, along with other implementing agencies, crafted the Philippine Soybean Roadmap for 2010-2014 titled, “*Building Sustainable Soybean in the Philippines*”.

The overall goals of the program include: establishing knowledge-based and farmer friendly research facilities for soybean production and development in strategic production areas in the country, and establishing strong partnership with private sector in the processing and marketing of soy-based products in local and international markets.

To improve soybean varieties and fill the gap on a possible larger market demand, BAR collaborated with DA attached agencies and staff bureaus, selected DA-RIARCs and UPLB-IPB.

During the first quarter of 2011, organic soybean production was officially launched through the conduct of technology demonstration trials in the

provinces of Kalinga, Abra, Ilocos Norte, Ilocos Sur, Isabela, Nueva Vizcaya, Quirino, Pampanga, Bataan, Tarlac, Batangas, Quezon, Cebu City, Mandaue City, Negros Occidental, Negros Oriental, Zamboanga, Zamboanga Sibugay, Bukidnon, Davao City, North Cotabato, South Cotabato, Agusan Del Norte, and Surigao del Sur.

Soybean seeds were distributed to the participating regions to carry out advanced yield trials. The foundation seeds harvested were distributed for seed multiplication production. For the 2011, there were 11,343 seeds harvested in Regions 2 and 11. Other regions are ready for harvest in early 2012.

BAR, together with ATI, spearheaded Training of Trainers (TOT) in different regions. Production, field day, workshops and seminars, accompanied by experts, were likewise conducted. BAR aims to promote soybean farming in able for farmers to gain more knowledge of the crop, to provide healthy and nutritious food to the Filipinos and to add income in their propagation.



Rubber

Rubber tree (*Hevea brasiliensis*) is a perennial crop and the source of natural rubber. Rubber production is considered a major industry and is providing livelihood and income for many people. Its growth rate is 3.3 percent annually, according to DA-HVCDP. Forty percent of the country's rubber production is being exported to other countries.

Propagation of natural rubber is one of the priority industrial crops under the DA-HVCDP. Through the DA's National Rubber Development Program (NRDP), the industry hopes to gradually increase the country's rubber plantation and production. One major component of the NRDP is its strengthened effort on the rubber research and development (R&D).

In support to the national priorities, BAR is handling the R&D and extension (RDE)

activities on rubber management and propagation through implementing R&D projects in partnership with regional research centers and SUCs. The projects include performance trials of recommended rubber clones and demonstration of seedlings nursery and budwood gardens in non-traditional rubber areas, wherein there are large areas of idle land and denuded hilly lands.

Farming systems research projects were being conducted in prominent rubber-growing areas in Mindanao. The project activities and accomplishments of BAR have put up the groundwork towards the attainment of the national objective to expand rubber plantations in the country. The knowledge and experience gained by the implementers through hands-on experience and formal trainings and workshops have set the stage for the continuous support to rubber

research and development.

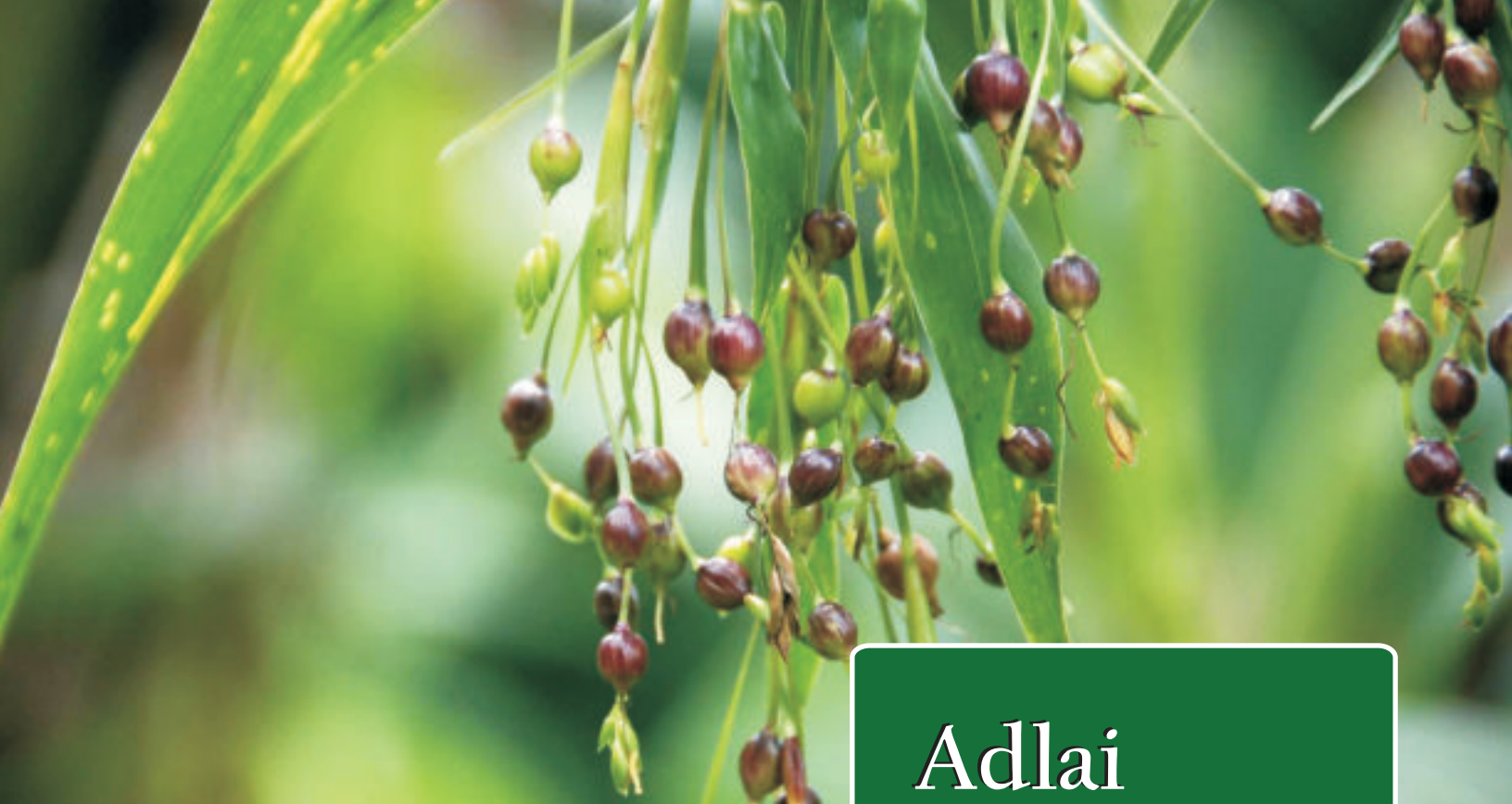
Among the research priorities identified under the rubber R&D were: 1) performance and adaptation trials of recommended rubber clones and production technologies; 2) budwood garden and seedling nursery development; 3) development of tissue culture methods for mass propagation; 4) pests and diseases control and management; 5) management of tapping panel dryness; 6) demonstration farms establishment and maintenance; 7) harvesting technologies, adaptation and development; 8) latex processing and marketing; 8) rubber products development and promotion; and 9) infrastructure and facilities development for rubber R&D.

At present, there are 11 recommended rubber clones in the Philippines. These are: RRIM 600 (Rb 99-01), RRIM 628, RRIM 712, RRIM 901, PB 217 (Rb 99-02), PB 235 (Rb 99-04), PB 260, USM 1 (Rb 99-03), PB 311, PB 330, and PB 331.

In 2011, BAR implemented 19 on-going rubber propagation projects (see Table 2).

Table 2. Rubber R&D Projects implemented by BAR in 2011.

TITLE OF THE PROJECT	AGENCY	APPROVED DURATION
1. Promotion of Establishment of Technologies for Rubber (<i>Hevea brasiliensis</i>) Towards Commercialization in Northern Luzon	DMMSU	2 years
2. Adapting Rubber Budwood Garden and Nursery Management Towards Commercialization in Central Luzon	CLIARC	2 years
3. Adapting Rubber Nursery (<i>Hevea brasiliensis</i>) Establishment and Management Towards Commercialization in Luzon	BPI	2 years
4. Performance Evaluation of Rubber Towards Commercialization in Rodriguez, Rizal	URS	2 years
5. Promotion of Commercial Rubber Production at UP Laguna- Quezon Land Grant	UPLB-FI	1 year
6. Commercialization of Rubber in Quezon Province	SLSU	2 years
7. Development and Promotion of (<i>Hevea Brasiliensis</i> Muel Erg.) Towards Commercialization in Oriental and Occidental Mindoro	4B-RIARC	2 years
8. Techno- Demo of Recommended Rubber Clones And Nursery Establishment Toward Commercialization in Palawan	PAES	5 years
9. Introduction of New Rubber Clones for Adaptation and Commercialization I Eastern Visayas	EVIARC	2 years
10. Development of Molecular Markers for Identification and Authentication of <i>Hevea brasiliensis</i> Clones	USM	3 years
11. Development of Tissue Culture Techniques for Rapid Propagation of Rubber	USM	2 years
12. Developing Baseline Information System for the Philippine Rubber Industry	USM	2 years
13. Rubber Development Program for Southern Mindanao: A Support Program Toward the Revival of NR Industry	SMIARC	2 years
14. Rubber Agribusiness Development Project in Region IX	WESMIARC	2 years
15. Community-based Participatory Action Research (CPAR) on Rubber-based Farming Systems in Zamboanga Peninsula	WESMIARC	2 years
16. CPAR on White Corn Under Newly Developed Rubber Plantation in South Cotabato	CEMIARC	2 years
17. Evaluation and Production of Promising Rubber Clones Using Improved Nursery Management Practices in Region XIII	CARIARC	1 year
18. Survey of Rubber Agroforestry Models	UPLB	2 years
19. Multi-location Clonal Performance Trials	USM	2 years



Adlai

Consistent with the DA's effort in promoting food stability and food security, plans and strategies have been mapped out to ensure sustainable development of food production. In response, BAR promotes *Adlai* as one of its priority programs particularly in contributing to food security.

Adlai (*Coix lacryma-jobi* L.) also referred to as “Job's tear” due to its tear-like shape, belongs to the family of rice, corn, barely, sorghum, and oat. *Adlai* is known to have a wide array of uses, but the economic potential has been poorly addressed, thus its value is confined mostly to traditional or local uses. Found to be nutritious, *Adlai* can be used as alternative to rice.

BAR, in collaboration with other food crops stakeholders, has conducted extensive research on *Adlai* and is now in the process of developing program framework and parameters like the conduct of adaptability trials in selected

regions. This is in line with the precept of finding an alternative staple food crops other than rice and corn. In collaboration further with the non-government organizations like Earthkeepers and MASIPAG, BAR led the implementation of *Adlai* Research and Development Program through location-specific technology.

The *Adlai* R&D program aims to develop, promote and utilize *Adlai* as traditional food crop to complement rice and corn. Several R&D initiatives have already been conducted and coordinated by the BAR. As a result, the bureau has already identified other *Adlai* researchable areas such as seed storage and milling, pest management, documentation of indigenous practices, supply chain and development of location-specific cultural management practices.

The documentation on *Adlai* local varieties and indigenous practices on production and harvesting were conducted in Regions 5, 9,

10, and CAR. Results of the documentation revealed that Reg. 9 demonstrated a good model for organic production of *Adlai*.

In November 2011, *Adlai* proponents have distributed 438 kg of seeds to farmers and LGUs and have utilized a total production area of 30.24 hectares. New expansion sites of *Adlai* adaptability yield trial and seed production were conducted in DA-RFU 9-WESMIARC and DA RFU 11-SMIARC with budget allocation of P 500,000.00 per region.

Based on the cost and return analysis, DA-RFU 5 computed the net income of growing *Adlai* in one hectare. Based on the initial computation, an income of P 14,534.00 per hectare is obtained (Table 3).

Table 3. Cost and returns of *Adlai* production per hectare

PARTICULARS	Quantity	Unit Cost	Total
Revenue			
Milled Polished Grains (kgs)	1,712.88	25.00	42,822.00
Total Revenue			42,822.00
Expenses			
Variable Cost			
Inputs			
Seeds (kg)	10	50	500.00
Sub-total (inputs)			500.00
Labor			
Land Preparation			
Plowing (Machine hour)	3	1,500	4,500.00
Harrowing (MAD)	3	350	1,050.00
Furrowing (MAD)	4	350	1,400.00
Sowing/planting (MD)	10	200	2,000.00
Handweeding (MD)	15	200	3,000.00
Harvesting (MD)	15	200	3,000.00
Hauling (kgs)	3,294	0.25	823.50
Drying (MD)	10	200	2,000.00
Sub-total Labor			17,773.50
Post-harvest Processing			
Threshing (kgs)	3,294	2.0	6,588.00
Milling (kgs)	1,712.88	2.0	3,425.78
Sub-total (processing)			10,013.78
Total Expenses			28,287.26
Net Income			14,534.74





Apiculture

Philippines is an import-dependent country of honeybee products. The country procures about 200 tons of honeybees every year and other bee products including pharmaceutical and cosmeceutical products. Seeing the big potentials, beekeeping, also known as apiculture, is gaining ground as an income generating livelihood with the production of valuable products such as honey, pollen, beeswax, and propolis.

The DA recognizes the importance of identifying problems and constraints to make high-end bee products affordable and available to the consumers. Hence, beekeeping is considered as one of the priorities under the DA-HVCDP. It recognizes the importance of bees in crop pollination and apiculture in the agriculture sector.

In order to meet the high demand for

honey and other bee by-products, the DA-HVCDP and BAR met with major players and stakeholders of the industry and crafted the Bee Industry Roadmap.

As part of technology development, BAR organized a workshop-writeshop to harmonize R&D and commercialization proposals with the roadmap. This activity was attended by representatives from the DA-HVCDP, National Apiculture Research and Training Development Institute, Don Mariano Marcos Memorial State University (NARTDI-DMMMMSU), University of the Philippines Los Baños (UPLB) Bee Program, DA agencies, state universities and colleges (SUCs), and private sectors.

In 2011, 19 bee project proposals were received for evaluation and possible funding. Included were proposals on production, marketing, capability building, postharvest and marketing, among others.

R&D PRIORITIES



Basic and Strategic Researches



Strategic

Basic

BASIC RESEARCH is any experimental or theoretical work undertaken to acquire new insights on the underlying foundations of physical and biological phenomena and observable events, without any predetermined application or use in view.

STRATEGIC RESEARCH compares the performance of promising technologies with that of the farmers' practices conducted in their own farms.

Since its establishment in 1987, BAR has been supporting and prioritizing researches that focus on improving the knowledge bank on agriculture and fisheries (A&F) and those that concentrate on technology generation, verification, and dissemination.

Basic or upstream research aims to increase the understanding of the essential facets of certain phenomena related to A&F, devoid of its application towards systems and processes. Meanwhile, applied or midstream/downstream research seeks to develop technologies that will improve A&F procedures (midstream) and will verify and disseminate these technologies to the stakeholders (downstream).

The Project Evaluation Section (PES) of the Planning and Program Development Division (PPDD) heads the screening, review, and evaluation of regional and national R&D proposals and it also processes the release of funds for the approved R&D projects.

In 2011, three consecutive issuances of the

call for proposals were conducted in January, June, and July. The first call for proposals on applied/basic research, biofuels, climate change, indigenous plants, organic agriculture, and technology commercialization was directed to partner SUCs. The second call for proposals on CPAR rice-based projects as the R&D component of the Rice Self-Sufficiency Plan of DA was issued to 16 DA-RFUs. The last issuance is on organic agriculture which is directed to DA-RFUs, RFRDCs, DA National R&D Implementing Agencies, SUCs, LGUs, and private sectors/NGOs/CSOs.

In 2011, BAR funded basic researches that focused on indigenous plants (e.g., culinary herbs and spices, natural preservatives, medicinal plants, etc.) and biotechnology through the Biotechnology Program Implementation Unit of the Department of Agriculture (DA-Biotech PIU) (e.g., genetic engineering, diagnostics).

Meanwhile, the applied researches funded by BAR were focused on CPAR (e.g., integrated farming systems), climate change (e.g. adaptation strategies, vulnerability assessment, documentation of indigenous knowledge, selection and breeding of drought, flood resistant crop varieties, etc.), organic agriculture, indigenous plants for health and wellness, rainfed agriculture, biotechnology (e.g., diagnostics, genetic engineering, policy and advocacy), Site Specific Nutrient Management (SSNM) for white corn, and priority commodities for HVCDP (e.g., adaptability trials, development and promotion of adlai).

In 2011, 224 new projects were funded. Among these projects, it is significant to note that applied research and biotechnology projects were the most numerous. Also, 80 projects are on-going, with CPAR projects as the most numerous (Table 4).

Table 4. New and continuing projects funded for 2011.

TYPE OF PROJECT	NEW	CONTINUING	TOTAL	RELEASED AMOUNT
Applied	72	19	91	100,166,728.98
Basic	3	1	4	2,776,210.00
CPAR	25	50	75	38,530,246.00
PRA	10	0	10	2,066,000.00
Biotech (PL480 and 2011 Funds)	48	6	54	66,114,512.38
HVCDP (2010 and 2011 Funds)	24	0	24	20,533,275.00
Corn 2011	21	0	21	14,681,054.00
Rice 2011	4	4	8	7,010,000.00
OA 2011	17	0	17	40,451,765.70
TOTAL	224	80	305	292,329,792.06

Human Resource Development Program

To accommodate the increasing demand for assistance in development programs, BAR continues to support policies and programs for R&D human resources capability building. Through the Institutional Development Division (IDD), BAR prioritized programs that would provide opportunities for further enhancement of R&D initiatives and activities.

The Human Resource Development Program (HRDP) is one of two of the components of the Institutional Development Program of BAR. Capability building programs are designed exclusively for National Research Development System for Agriculture and Fisheries (NaRDSAF) members composed of DA staff bureaus and affiliated agencies, DA regional R&D centers, local government units (LGUs), state universities and colleges (SUCs), Provincial Technological Institutes for Agriculture and Fisheries (PTIAFs), and other R&D agencies.

Scholarships and training financial grants are awarded to enhance management capabilities of members in ensuring effective and efficient implementation of agriculture and fisheries R&D initiatives and projects. HRDP offers researchers and support staff with opportunities of growth in their specialties through the DA-BAR NaRDSAF Degree Scholarship Program, Non-Degree Assistance Program, and the Productivity Enhancement Program.

DA-BAR NaRDSAF Degree Scholarship Program supports the Agricultural and Fisheries Modernization Act (AFMA) as it caters to research and development staff members who intend to pursue higher studies such as an MS or PhD degree from any of the 12 accredited universities/colleges around the country (Table 5).



Table 5. New scholars admitted for SY 2011–2012

Name	Affiliation	Course
Acabal, Bienvenido D. Jr.	DA RFU VII	PhD in Plant Pathology at UPLB
Cantoneros, Joel	DA RFU VIII	PhD in Environmental Science at CLSU
Mag-Aso, Jennet R.	USM	MS in Environmental Science at UPLB
Paguitan, Jhalanie P.	DAF-ARMM	MS in Agriculture/Horticulture at USM
Superioridad, Ronald D.	USM	MS in Social Science at UPLB

Human Resource Development Program

DA-BAR Non-Degree Assistance Program accommodates researchers and scientists who seek to amplify their expertise in the fields of agriculture and fisheries through providing attendance/participation opportunities in fellowships, trainings and conferences, and financial assistance in conducting thesis/dissertation studies. Post-Doctoral and Senior Scientist Research Fellowship in Basic Research for Agriculture and Fisheries, Thesis/Dissertation Assistance Program (TDAP), and Training Support to International/Local Training and Conference fall under this program (Table 6).



Productivity Enhancement Program addresses the need for planning workshops that enable for the refocusing of plans of action and clarification of objectives, and recognizes the importance of acknowledging exceptional contributions and achievements in the fields of agriculture and fishery. The DA Scientific Career System, Gawad-Saka, and the National Research Symposium are among the activities in 2011.

Human Resource Development Program

Table 6. Thesis/Dissertation Assistance Program Grantees for 2011

Grantees	Agency/ Institution	Course/School	Title of Research Study
Ma. Asuncion A. Beltran	TCA	PhD Animal Science/ CLSU	Cryopreservation of Goat Semen
Carlos V. Cortez	BU	MS Environmental Science/UPLB	Environmental and Social Life Cycle Assessment of Abaca Cordage
Marilyn R. Oea	ASCOT	PhD Animal Physiology/CLSU	Behavioral and Physiological Responses of Heat Synchronized Goats
Marilou M. Benitez	VSU	PhD Horticulture	Comparative Effects of Different Organic Inputs on Growth, Yield and Antioxidant Properties of Ampalaya
Junel B. Soriano	BASC		Water Use Efficiency and Methane Emissions Under Aerobic Rice Production System as Influenced by Water regimes, Soil Textures and Drought Tolerance Rice Cultivars
Francia D. Oeteza	LGU-Castilla, Seesogon (RFU 5)	MS Agronomy/BU	Yield Quality Assessment of Lettuce Applied With Biodegradable Wastes as Compost Tea
Ben-Hur C. Rafosala	USEP	PhD Agric'l. Eng'g/UPLB	Dynamic Mechanical Properties of Mango
Recylm I. Bayna	UPLB	MS Applied Nutrition/ UPLB	Hypoglycemic and Hepatic PEPCK Activities in Type 2 Diabetic Mice Fed With Partially Purified Okra Fruit Extract
Dario P. Lina	VSU	PhD Horticulture/UPLB	Phenology, Floral Biology and Fruit Development in Jackfruit as Affected by Growth Regulator Fertilizer Application and Assisted Pollination
Ronaldo R. Libunao	DA-BFAR 2	PhD Public Administration/ Cagayan State University	Socio-Economic Impacts of Aquaculture Technology Demonstration Projects in Cagayan Valley
Mylene R. Corpuz	ISU	PhD Agricultural Sciences [Crop Science]/ISU	Population Density of Insect Pests on Corn Biomass Yield Intercrop With Legumes
Xyza Kristina D. Billones	MSU, Naawan	MS Marine Biology/MSU, Naawan	Carrageenan Quality and Antioxidant Activities of Four <i>Kappaphycus</i> sp. Cultivars from Selected Areas Grown During Two Monsoon Seasons in Pagul Bay
Ar-Jay A. Aquino	CLSU	MS Soil Science/CLSU	Validation of Nitrogen Dynamics in Crop Rotations in Ecological Agriculture (NDCEA) Model as a Decision Support Tool for N Management in Broccoli Production
Vivencio A. Prlesco	Naval State University, Biliran	MS Mechanical Engineering/ MSU- IIT	Integrated Solar Still-Hydroponics System for High Value Vegetable Production
Romecita R. Rosolada	SLSU	PhD Horticulture/VSU	Responses of Tomato to Combine <i>A. pintoi</i> Extract and Inorganic Fertilizer Grown Under Two Cultivation Systems
Noel Genturo	ESCOF	PhD Horticulture/VSU	Distribution, Characterization and Socio-Cultural-Economic Values of Indigenous Beef Cattle Breed in the Islands of Panay and Guimaras, Philippines
Reinalyn Nicolas	LGU 12	PhD Rural Development/USM	Agriculture Extension Delivery and Support System in the Conflict-Affected Areas in the Province of Cotabato
John Fitzken Da Vince M. Niro	BU	MS Agricultural Engineering/CLSU	Modification, Fabrication, Testing, and Performance Evaluation of Stationary Type of Coconut Husk Decorticating Machine
Arlene Novo	LGU 10	MS Aquaculture/MSU Naawan	Growth Performance of Rabbitfish, <i>Siganus guttatus</i> (Bloch) in Cages Using Different Feeding Schemes

R&D Facilities Development Program

The R&D Facilities Development Program (RFDP) is another component of the Institutional Development Program. Opportunities for expansion are made available to NaRDSAF member institutions in terms of acquiring basic facilities and equipments for science and information technology development. RFDP also takes charge in developing and further enhancing the entire R&D system. These objectives are implemented through programs and initiatives such as the Institutional Development Grant (IDG), Master Development Plans of DA R&D Units, R&D database updating, and other activities.



R&D Facilities Development Program



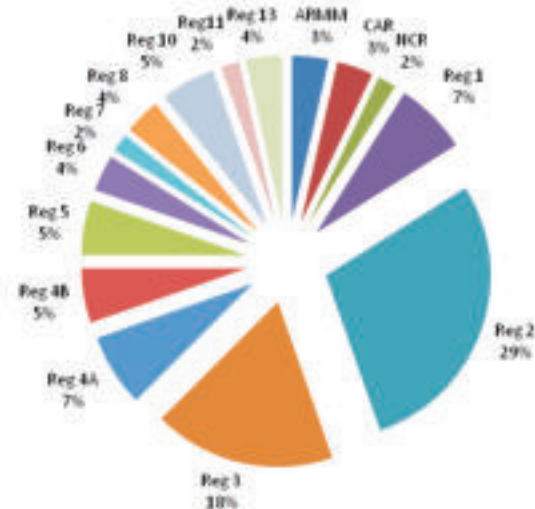
Institutional Development Grant (IDG)

Construction, acquisition, and renovation of infrastructures directed to the development of R&D initiatives and enhancement of R&D centers.

In 2011, 56 approved IDG projects were distributed among DA bureaus, DA-RIARCs/RFRDCs, RFUs, SUCs, LGUs, and private institutions in the agricultural and fisheries sector. A budget of Php 136,681,393.94 was distributed among these projects, with Php 28,431,741.00 appropriated for eight establishment and improvement of organic agriculture facilities projects in CAR, Eastern Visayas, and Bicol regions through the assistance of DA-CVIARC and SUCs.



Figure 3. Institutional Grant for CY 2011 according to regions



Research Policy and Advocacy

The Policy and Planning Section (PPS) is concentrated on four principal areas of concerns: impact assessment and focus, policy research and analysis, R&D governance and quality of science, and results-based planning and evaluation.



Impact Assessment and Focus

Seeking to assess the impact of the rising number of CPAR projects nationwide to the Filipino farming and fishing communities, BAR supported two impact assessment studies in 2011.

The International Society for Southeast Asian Agricultural Science (ISSAAS) received PhP 2,000,000 for their project, “Results-oriented Project Evaluation of the CPAR in Selected Agricultural Regions of the Philippines”, which aims to create a results-oriented evaluation of CPAR projects in Regions 1, 4A, and 10 and to appraise the effectiveness, efficiency, impact, and outcome of the CPAR program. Meanwhile, the Center for Local and Regional Governance (CLRG) of the University of the Philippines Diliman received PhP 2,420,000 for the project titled, “Process Documentation of CPAR Projects,” with the goal to discern and review information systems for CPAR and investigate its initial impacts on beneficiaries. This will help policy, decision-makers, and implementers in drafting guidelines for project replication purposes.

Policy Research and Analysis



With the goal to provide valuable inputs to BAR and DA, PPS gave technical contributions for the Office of the Undersecretary for Policy, Planning, Research, and Regulation, in commenting and suggesting on the proposed Senate Bills related to the Philippine Agricultural Extension System. The section also provided inputs for BAR's 2011-2016 corporate plan.

It has provided propositions and commentaries on the Philippine Rural Reconstruction Movement's (PRRM) proposal "Organikong Palayan: A Season-long Training for Sustainable Rice Production" by the Agricultural Training Institute (ATI). It also organized the BAR-funded project "An Assessment of Smuggling on Selected Agricultural Commodities in the Philippines" with the total budget release of PhP 3,996,000.00.

Congregating information on the newest trends in A&F research and development, the Section accomplished a list of cost-cutting technologies for DA. The technologies listed were for corn, vegetables, and fruits. These were accessed from BAR's AgFishTech Portal in response to the Regional A&F Council – Region VI Resolution No. 11, Series of 2011 requesting DA to adopt a cost-cutting technology.

R&D Governance and Quality of Science

To ensure that A&F R&D will benefit its intended stakeholders and will increase productivity to achieve national food security, the Section provided technical support during the "Workshop on Mainstreaming Climate Change Adaptation in National Sectoral Plans" in May 2011. The workshop aimed to enhance awareness of different sectors on the key aspects of climate change that needed to be incorporated in sectoral and national plans, sectoral approaches, and budget processes. Also, PPS facilitated the BAR-funded project "Productivity Growth in Philippine Agriculture: Year III".





Results-based Planning and Evaluation

This area of concern emphasizes the planning, formulation and updating of RDE agenda and commodity programs and thematic priorities, focuses on the physical and financial targets of BAR, and collates the periodic achievements to evaluate the bureau's performance if it hits its targets.

As the focal agency for R&D services of DA, holding responsibility in formulating of plans for the A&F Modernization Plan (AFMP) for 2011-2016, BAR through PPS gave comments in the AFMP 2011-2016 Planning Framework and Guidelines and in the mainstreaming of Disaster

Risk Reduction and Climate Change Adaptation in the updated AFMP, fabricated strategies presented in the Strategy Paper for R&D Services that will serve as constituent plans of the final AFMP, and arranged several forms by the recommended matrix format.

To create receptive demand-driven R&D agenda in order to address budding concerns and to serve as a guide to partner agencies in proposal making, the Section performed several multi-sectoral consultation activities and workshops related to the crafting of agenda and programs of BAR.

Information Communication Technology



With the growing dependency and need for computers and all of its related counterparts, acquiring the hardware may as well be the easier component. The time and effort lies with maintaining the system and updating the necessary components in a timely manner. As such, BAR's Information Management Unit (IMU) is tasked to maintain all IT equipment and provide technical assistance to the users.

IT services include: IT support during meetings, presentations and other BAR events; troubleshooting of printers/printing problems and software problems; network/Internet connectivity; replacement of parts of computers and other IT devices; cabling and relocation of computers and telephone; printing of BAR IDs.

In 2011, IMU performed the services/activities such as technical assistance in terms of printer troubleshooting, network and internet connections, software installation, hardware replacements, including reformatting of computers and relocation of workstations.

Continuing with the previously mentioned line of maintaining and updating pre-existing systems, IMU's Information Systems and Development (ISD) group is tasked with the responsibility of addressing requests for development of new systems and modifying existing ones.

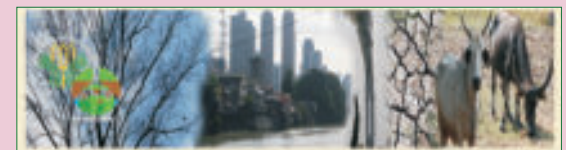
The Scholarship Evaluation and Monitoring System, the

Research and Development (R&D) Resource Information Management System, and Supplies, Property, Plant and Equipment Inventory System were some of the BAR systems included in requests for modification forwarded to the ISD group. Some of the modifications included the following: modified report formats; edited queries for the corresponding system's dropdown menu; modified sub-menus; edited queries; module and created reports correspondingly; and in the case of the Employee Daily Time Recording System, edited the form "Generate logbook for the Day" by setting the field to present date as the default date.

In light of going beyond a preexisting system, IMU has two new systems that are being developed: the Proposal and Project Monitoring System (PPMS) and the DA-BAR Project Staff Payroll System. PPMS is designed to encapsulate all proposal and project details such as status of incoming

proposals and budget release. Completed modules of the Project Monitoring System include Administrative, Project, Finance, and Report Generation. The completed modules refer to the system administration function of the system, for project monitoring, for finance users regarding project budget and monitoring of check releases, and reports generated by the system, respectively.

In addition, BAR Online, the Bureau's website is part of the Web Development and Maintenance initiative of IMU. Regularly updated, it is maintained so as to be up to date on the latest information and activities of the Bureau. The updates maintained include web versions of the BAR Digest and BAR Chronicle. For 2011, additional portals were added to the BAR Online, particularly Climate Change and the Asian Food and Agriculture Cooperation Initiative (AFACI).



Knowledge Products and Services

The Applied Communication Division (ACD) of BAR has aptly responded and met with the demands of ensuring inter-agency complementation and harmony in the field of information dissemination and distribution, particularly the need to express in terms of organized and useful information.

The publication section of ACD produced 13 issues of the *BAR Chronicle* (monthly newsletter), one of which was a special edition focused on the 23rd National Research Symposium (NRS). The special issue discussed NRS 2011's theme, along with the preparations and events that lead up to the much successful two-day NRS event. During the 23rd NRS, the special edition was among the publications given away.

Aside from the 13 Chronicles, the division also published two issues of *BAR R&D Digest* (quarterly magazine), highlighting the technologies and projects funded by BAR, particularly the promising results found in the aforementioned endeavors. The two published issues cover the 1st and 2nd Quarter, with two more pending issues from the 3rd and 4th Quarter in due for layout and release.

ACD's publication section also produced the 2010 *BAR Annual Report*, the 2010 *NRS Proceedings* as well as two Research and Development Extension Agenda and Program (RDEAP) books on *Climate Change* and *Rainfed Agriculture*. The 2010 NRS Proceedings was also among those given away during the 23rd NRS, while the latter two were handed out during the 7th National Technology Forum.



technology brochures and flyers

Knowledge Products and Services



publications online



press release

Aside from the regular publications created and released, 1,000 BAR Planners and 2,500 BAR Technology wall calendars were packaged and distributed, including 30 technology/program brochures, as well as other materials in relation to DA's programs and activities (i.e. tarpaulin, press releases, promotional advertisements, and souvenir programs).

Keeping up with the speed of technology, particularly in line with the Internet, *BAR Online* is constantly being updated. With 99 webnews and articles, 65 photo releases with 2,047 photos, 25 webphotos, and 15 announcements, ACD's efforts maintains that *BAR Online* is consistently on time and efficient in the dissemination of information to its counterparts in both government and non-government capacities.

Even more so, in the interest of BAR reaching out to more people, as well as building interest in the field of research and development (R&D), the division also taps into television and radio programs, with 111 documented success stories from Community-based Participatory Research and National Technology Commercialization Program through the *Mag-Agri Tayo* TV program, and five documented BAR projects through *Maunlad na Agrikultura* and DWAD, DZRB radio stations. The Division's efforts in enhancing and promoting R&D also extends to the inquiries received. A total of 55 queries from farmers and researchers, both via the Internet and phone, were fielded by the Division and were promptly responded to.



television interview

Knowledge Products and Services

Aside from all the published materials that the ACD has produced in 2011, the Division continues one of its major responsibilities in documenting BAR and R&D-related activities. In 2011, ACD has participated and documented a total of 113 CPAR, NTCP and other BAR-funded projects, including R&D-related activities including meetings, official visits of international partners, conferences, consultation-meetings, media coverage, training, etc.

Other than the publication section of ACD lies the Education Communication Section, where a total of 36 BAR Seminar Series were facilitated and coordinated, varying in relevant topics in both agriculture and fisheries.

In addition, BAR participated as well as sponsored local and international exhibits, having prepared and installed 11 exhibits at the national, regional, and local levels that highlighted BAR's banner programs, services and activities. During these exhibits, including other R&D activities such as forums, seminars, workshops, and trainings, the Division has handed out a total of 23,000 copies of information materials varying from what and for who BAR is, to the different technologies and services the bureau is able to offer.

In line with coordinating the implementation of projects such as meetings, field visits/monitoring and evaluation, documentation, and hands-on-training to target beneficiaries and stakeholders, ACD has also coordinated with the development of system for data banking and exchange with member institutions (RIARsC/RFRDCs and SUCs) and provided technical assistance to member agencies. Furthermore, the Division also coordinated with the editor, layout artist, and publisher on the finalization of two book projects published on climate change and rainfed agriculture.



exhibits and fairs



seminar series



book launch





CLiENT-ORiENTED SERVICES

R&D Technology Commercialization Center



Established in 2009, the R&D Technology Commercialization (TechCom) Center serves as the abode of more than a hundred products and technologies produced through BAR's banner programs: NTCP and CPAR.

The products on display include wines (from mango, *bignay*, *duhat*, pineapple, tamarind, oregano, *ubi*, sweet potato, sweet sorghum, cashew, *yacon*, and santol); oregano (wines, vinegar, juice, soap), sweet sorghum (vinegar, wine, noodles, cookies, coffee, flour, jaggery, and syrup), seaweeds (marmalade, jam, chips, pickles, candies, noodles, and dips), cosmetic products like soaps and oils from sweet tamarind, VCO, turmeric, ginger, *Acapulco*, papaya and sweet sorghum; tea and coffee from turmeric, ginger, pigeon pea, *banaba*, miracle leaf, *sambaing*, *yacon*, *Moringa*,

oregano, sweet sorghum and rice; processed fish products like *tilapia tocino*, nuggets, and *longanisa*. Also on display are crops that are being pushed for commercialization by DA like Adlai and high-yielding varieties of peanut including *Asha*.

Technology guides, information sheets, and other IEC materials are also being provided in the showroom. This will greatly help in disseminating new and reliable information regarding better ways in doing agriculture to the visitors.

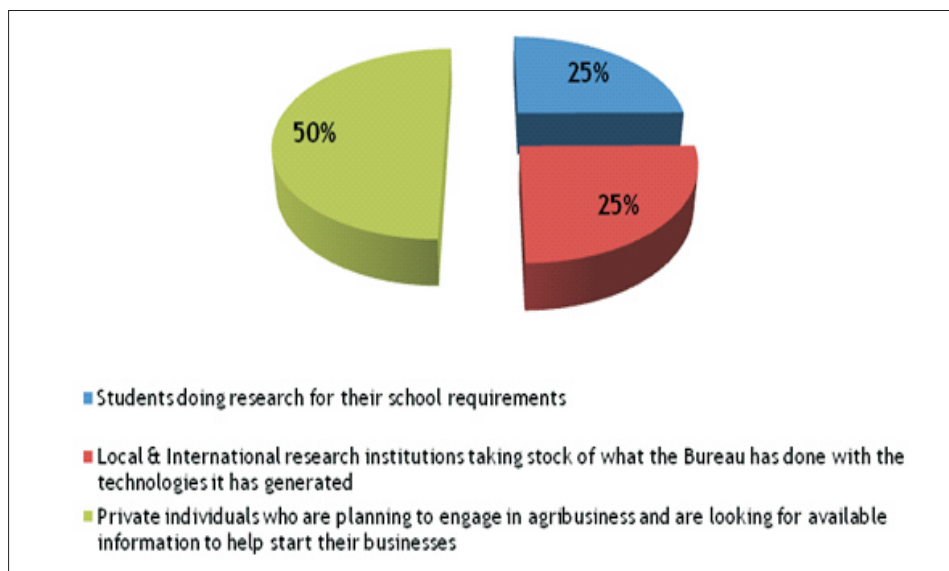
A masterlist of products on display, producers, technology generators, partner institutions and other relevant information has been put together to ensure that the TechCom Center will be able to facilitate linkages with those interested in venturing into agribusiness.

R&D Technology Commercialization Center



For 2011, a total of 470 people visited the showroom including mostly from international and local R&D institutions (Figure 4).

Figure 4. Distribution of showroom visitors for CY 2011



Scientific Literature Services



The Scientific Literature Services (SLS) is one of BAR's client-oriented services which was set up to develop a far more accessible and efficient library and information system. This service aimed at encouraging partners from regions, SUCs and other private partners in the field of R&D, as well as strengthening a wider utilization and application of different technologies.

With the tasks assigned to the SLS, 3,320 publications have been sorted and grouped into two categories: 175 BAR-published and BAR-funded publications, and 3,135 non-BAR publications. They have also performed 3,135 cataloguing and classification of the aforementioned publication.

In addition, a total of 3,315 books were accessioned, including having created an accession record. Titles amounting to 2,096 were encoded into the Infolib, with 98 titles allotted to the D-Space and 662 metadata into the Koha system. Furthermore, 1,756 agriculture- and fisheries-related news clippings

for data storage and processing were coded and filed. These data were then scanned and stored in a CD, arranged by month and coded according to its agriculture and fisheries development aspect for easier retrieval and storage.

The SLS also attended to phone calls, walk-in visitors, as well as responded to email messages and inquiries with regard to agriculture and fisheries information. Inquiries and corresponding responses included knowledge on sustainable and secured development as well as technologies, information, processes, and methodologies, and agricultural commodity statistics and other relevant data.

Beyond the expected regular activities and services of the SLS, they also secured and bound printed copies of metadata/catalogs, information retrieval/referrals, reference service, and searched external database programs for any availability of a cataloguing copy.

Intellectual Property Right Support



An effective IP management promotes and creates business enterprises, encourages market access, attracts foreign investments, and possibly promotes fund feedback to R&D. BAR, being the central coordinating agency for R& within the DA and the NaRDSAF, ensures that IPs generated within the system through BAR funds are given proper IP protection through registration with the Intellectual Property Philippines. These include all IPs namely; patent, utility model, trademark, among others.

BAR, through its Intellectual Property Rights Management Section (IPRMS) provides IP assistance not only for its funded research outputs but also to other public and private institutions. The assistance provided comes in many forms from very simple provision of information to as complicated as drafting claims.

In 2011, the Intellectual Property (IP) Philippines has recently awarded two trademark certificates to *Kalipayan Products* and *Likas Kaya*, which BAR through its IPRMS assisted in the filing and processing of their IP applications as well as in providing legal and technical assistance.

The *Kalipayan Products* was awarded the trademark for their stylized "G" logo and device which they could now use in their product labels. The approved trademark consists of a very stylized letter G in black color in continuous writing with rough edges. The *Kalipayan Products*, owned by Ms. Ma. Elena A. Tabora, is the producer of Negros Occidental's original *Gourmet Tuyo*, noted for its Pinoy flavor and is now eyeing the global market.

Meanwhile, the *Likas Kaya*, which produces organic fertilizers, was awarded the trademark of the word "*Likas Kaya*" and three-arrow device in green color. The trademark was applied by Mr. Arnold N. Venturina, president of the Occidental Mindoro National State College.

Also in 2011, four completed projects and four brands were reviewed to determine for potential IPR. The Section provided direct assistance to IP rightholders. Clients include all those with ongoing applications with IP Philippines, those seeking advice what to do with their current IPs, and those who are not yet aware that they have tangible IP assets that might possibly be helpful for them.

MAJOR ACTIVITIES

COMMERCIALIZATION OF BEEKEEPING TECHNOLOGIES

DA-BAR Funded Project



THE MEL PROGRAM
Established on 27 February 1987 in pursuance and execution of the 1986 Education Act (Act 381). It was recognized by the Department of Education as the National Centre of Excellence for Bee Research and Development (NCEB) and by the Commission on Higher Education as the 402 Outstanding National Center Program (2010) and as an NCE (2010).

THE VISION

To become the center of excellence in beekeeping research, development and commercialization.

THE MISSION

Strengthen beekeeping research, development and commercialization.

Provide beekeeping services to the public.

Develop beekeeping products.

Conduct beekeeping education.

Conduct beekeeping extension.

Conduct beekeeping research.

Conduct beekeeping development.

Conduct beekeeping commercialization.

Conduct beekeeping management.

Conduct beekeeping marketing.

Conduct beekeeping distribution.

Conduct beekeeping promotion.

Conduct beekeeping information.

Conduct beekeeping communication.

Conduct beekeeping coordination.

Conduct beekeeping cooperation.

Conduct beekeeping collaboration.

Conduct beekeeping partnership.

Conduct beekeeping alliance.

Conduct beekeeping consortium.

Conduct beekeeping joint venture.

Conduct beekeeping strategic partnership.

Conduct beekeeping network.

Conduct beekeeping platform.

Conduct beekeeping ecosystem.

Conduct beekeeping value chain.

Conduct beekeeping business model.

Conduct beekeeping revenue stream.

Conduct beekeeping profit margin.

Conduct beekeeping cost structure.

Conduct beekeeping financial statement.

Conduct beekeeping budget.

Conduct beekeeping financial plan.

Conduct beekeeping financial forecast.

Conduct beekeeping financial analysis.

Conduct beekeeping financial review.

Conduct beekeeping financial audit.

Conduct beekeeping financial statement.

Conduct beekeeping financial plan.

Conduct beekeeping financial forecast.

Conduct beekeeping financial analysis.





7th Agriculture & Fisheries Technology Forum & Product Exhibition

To showcase viable technologies developed by SUCs, the DA national and regional offices, and other R&D partner-institutions, the Bureau conducts the “Agriculture and Fisheries Technology Forum & Product Exhibition”. Aside from strengthening partnership between and among research organizations and the private sector, the Bureau sees this as an opportunity for the business sector to choose and shop for the best technologies to invest in and capitalize for commercial ventures.

In 2011, BAR conducted the 7th Agriculture and Fisheries Technology Forum and Product Exhibition held on 11-14 August 2011. With the theme, “Galing ng Makabagong Teknolohiya para sa Pag-unlad ng Magsasaka at Mangingisdang Pinoy,” the event also marked the Bureau's 24th year in the business of providing extensive

research to the agriculture and fisheries sector.

Agriculture Secretary Proceso J. Alcala served as the guest of honor for the activity. In his message, he said the forum serves as an instrument for the promotion of agriculture and fishery-based projects. He also reiterated the need to intensify private-public partnership in the pursuit of agricultural development. Meanwhile, BAR Director Nicomedes P. Eleazar lauded the participation and involvement of all the exhibitors and affirmed that the event provides opportunities for farmers and fisherfolk to showcase their own produce and for the private sector to adopt these technologies on a commercial scale.

The four-day event highlighted R&D breakthroughs generated and developed by R&D institutions and various stakeholders. There were

more than 9,000 visitors including walk-in guests. This number was considered unprecedented since the NTF was launched seven years ago.

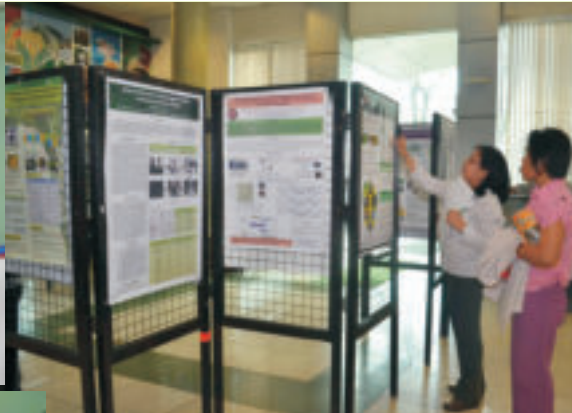
Ninety six exhibitors showcased food and non-food products during the forum. These exhibitors comprised of DA-families, SUCs, food manufacturers, and food distributors. The exhibits featured products, services, and technologies with commercial potentials developed on high-value crops, livestock and poultry, fisheries, natural products for health and wellness, biofuels, organic agriculture, and climate change, among others.

One of the innovations introduced this year was the simultaneous holding of technical presentations and technology demonstrations. For the technical presentations, nine technical papers were presented by selected experts and nine technology demonstrations were showcased. A cultural presentation also highlighted the event featuring the exemplary talents of the Regional Executive Directors, Technical Directors, and Research Managers showcasing distinct cultural presentations in their regions.

The identification and naming of the best booth, best product and best cultural presentations marked the conclusion of the 7th Agri-Fishery Forum. DA-RFU 8 bagged the “Best Booth Award” followed by RFU 4A and RFU 5 as second placers and RFU 10 and 11 for the third place. Aside from the best booth category, the “Best Products” went to RFU 1 (Garlic and Shallot Pickles); RFU 3 (Goat's Milk), RFU 4A (Adlai Products) and RFU 5 (Pili Oil). The Apiculture Booth, which was part of the special setting, also won best product. The Mindanao Cluster was hailed winner in the Best Cultural Presentation.

Other highlight of the event was the launching of three supported BAR publications: 1) Climate Change Research, Development and Extension Agenda and Program for Agriculture and Fisheries, 2) Philippine Rainfed Agriculture Research, Development and Extension Program (PhiRARDEP) Framework and Action Agenda, and 3) Proceedings of the 1st Sweet Sorghum Business Summit and Plantation Showcase. The publications were endorsed to Secretary Alcala.





23rd National Research Symposium

To recognize the vital role of researchers as catalyst for developing R&D that matters to the sector, BAR conducts the National Research Symposium (NRS). NRS is an annual competition featuring R&D paper entries from researchers and scientists from different R&D institutions throughout the country.

Entry papers are initially screened and accepted based on the relevance and usefulness of the research results to Agriculture and Fisheries Modernization Act (AFMA) goals, scientific significance, quality of science, and innovations to improve agricultural productivity. Paper entries compete in eight categories: 1) basic research 2) applied research - technology/information generation (agriculture), 3) applied research - technology/information generation (fisheries), 4) applied research - technology

adaptation/verification (agriculture), 5) applied research - technology adaptation/verification (fisheries), 6) development research (agriculture), 7) development research (fisheries), and 8) socioeconomics research.

In 2011, BAR conducted the 23rd NRS with the theme, “Harnessing Research for Safe and Healthy Food and Agri-Fishery Products”. Agriculture Secretary Proceso J. Alcala was the guest of honor during the awarding and closing ceremonies. He addressed the country's scientists and researchers by saying that agricultural competitiveness do not only mean producing enough food for the country, but likewise must have the capacity to promote it in the global market.

The prices for the 2011 NRS have increased by more than 100 percent. AFMA Best



R & D Paper Award received P100, 000 while the 1st and 2nd Runner-ups received P75, 000 and P50, 000, respectively. The increase of prices was borne out of the necessity to compensate researchers for their caliber output through the financial incentives given. Aside from the monetary adjustments made, entries for the symposium jumped from last year's 70 papers to 126 paper entries in various categories. This represents an 80 percent increase. Out of the 126 preliminary research papers received, 63 papers qualified and of which 25 papers vied for the AFMA Best R&D Paper Award, 1st and 2nd Runner-Up.

The NRS plenary sessions were held at BAR, while the awarding and closing ceremonies were held at the Manila Hotel.

NRS Winners

Table 7. Winners of 23rd NRS

	TITLE	AUTHOR/S	AGENCY
A. Basic Research Category			
Gold	Marker-Aided Transfer of Beta-Carotene Biosynthetic Genes (Golden Rice 1) into two Philippine Rice Varieties	Antonio A. Alfonso Emilie O. Espejo Christine Jade A. Dilla Gerald B. Ravelo Nelson S. Garcia Jean J. Somera	PhilRice
Silver	Cryopreservation of Oocytes by Minimum Volume Vitrification Methods for <i>in-vitro</i> Embryo Production in Water Buffaloes (<i>Bubalus bubalis</i>)	Eufrocina P. Atabay Edwin C. Atabay Floerfida P. Aquino Rodante V. de Vera Libertado C. Cruz	PCC
Bronze	Development of novel tissue culture-based seed system for year-round production of purple yam (<i>Dioscorea alata</i> L.)	Villaluz Z. Acedo Catherine C. Arradaza	VSU
B. Applied Research - TG/IG – Agriculture Category			
Gold	Application of Biological Control Strategies for the Management of <i>Brontispa longissima</i> in the Philippines	Ambrosio Raul R. Alfiler Johana C. Orense Ma. Leonila R. Imperial	PCA
Silver	Irradiation as a Quarantine Treatment for Mango Pulp Weevil, <i>Stemochetus frigidus</i> (Fabr.) in Philippine Super Mango	Glenda B. Obra Louella Rowena De Jesus-Lorenzana Sotero S. Resilva	PNRI – DOST
Bronze	Integration of Non-Chemical Approaches for Managing Crown Rot Disease of Banana	Dionisio G. Alvindia May Fleur T. Cuaresma	PhilMech



NRS Winners

	TITLE	AUTHOR/S	AGENCY
C. Applied Research - TA/TV – Agriculture Category			
Gold	Evaluation of Arabica Coffee Rooted Cuttings as Plant Materials	Avelina M. Galacio Josephine B. Ayban Norma B. Perdoche Joyce Jean O. Bacayan	BPI
Silver	Region-wide Utilization of the Light Trapping Technology for Insect Pest Management of Major Crops	Aida D. Solsoloy Marivic Begonia Jose Tolentino, Jr. Arlene Castillo Jay-R Baligat Sylvia Igarta Paz Mones Angel Padilla	DA - RFU 1
Bronze	Integrated Management of Citrus Snoutbeetle, <i>Metapocyrtus</i> (<i>Trachycyrtus</i>) spp.	Maritess A. Alimurung Amelia M. Cimafranca Trenesie M. Lorezco	BPI
D. Applied Research - TG/IG – Fisheries Category			
Silver	Detection of Mislabeled Commercial Fishery By-Products in the Philippines Using DNA Barcodes	Benedict A. Maralit Mudjekeewis D. Santos Roselyn D. Aguila Minerva Fatimae H. Ventolero Sweedy Kay L. Perez	NFRDI
Bronze	Municipal Fisheries Stock Assessment of Guimaras, Philippines for the Year 2008-2010	Drusila Esther E. Bayate Sheryll V. Mesa May R. Guanco Mateo C. Doyola, Jr.	BFAR - RFO6



NRS Winners

	TITLE	AUTHOR/S	AGENCY
E. Applied Research - TA/TV – Fisheries Category			
Bronze	Processing Sandfish, <i>Holothuria scabra</i> : Using Papaya Leaves to Remove Hard Spiculy Layer	Rosa A. Bassig Adoracion V. Obinque Gielenny M. Salem Rosario J. Ragaza Junwell S. Cabigao	NFRDI
F. Development Agriculture Category			
Gold	Intensification of the Innovative Goat Production Systems for Sustainable Rural Enterprise Development in Region I	Jovita M. Datuin Wilson D. Cerbito Josefina P. Bueno Cathy B. Pastor Sharon A. Viloría Luciana T. Cruz Florentino A. Adame Lemuel M. Abrenica	DA – RFU 1
Silver	Improved Arrowroot Production Technologies and Enhancement of the Arrowroot Starch and Flour in Catanauan, Quezon	Rosemarie Bautista-Olfato Virgilia D. Arellano Liwayway R. Pizarra Anna Pamela Agudilla Minerva C. Coronacion Digna P. Narvacan Aida P. Cariño	DA-RFU 4A (STIARC)
Bronze	Enhancing Food Security through Improved Rice Productivity and Increased Farmers' Income in the Rainfed Lowlands of Northern Mindanao	Cora Alolino Dumayaca Teresita Sandoval Rizal Corales Angelita Martir Juanita B. Salvani Juliet B. Araos	DA – NOMIARC



NRS Winners

	TITLE	AUTHOR/S	AGENCY
G. Socio-Economics Research Category			
Gold	Iron Fortification of Rice and Consumer Acceptance of Iron-Fortified Rice (I-Rice)	Amelia W. Tejada Edith M. San Juan Neri O. Camitan Amelita C. Natividad Mario U. Gochangco Lauro Alkuino Ma. Carlota Dy Zoraida L. Manalastas Alberto R. Cariso Alicia O. Lustre	NFA-FDC
Silver	Climate Change Risk Analysis on the Coastal Areas of Cabusao, Camarines Sur	Glenn Banaguas	DLSAU
Bronze	Coconut-Based Farm Diversification to Reduce Poverty in Coconut Growing Communities	Erlene C. Manohar Armylene Posada	PCA
H. Best Poster Competition			
Gold	Irradiation as a Quarantine Treatment for Mango Pulp Weevil, <i>Sternonchetus frigidus</i> (Fabr.) in Philippine Super Mango	Glenda B. Obra Louella Rowena De Jesus-Lorenzana Sotero S. Resilva	PNRI – DOST
Silver	Field Culture of the Scallop, <i>Decatopecten striatus</i> : Stocking Density Effects to Growth, Recovery and Production	Victor S. Soliman Antonino B. Mendoza, Jr. Renan U. Bobiles Alex P. Camaya	BUTC
Bronze	Application of Embryo Culture Technique in the Field Collecting, Movement and Culture of Tutupaen Tall Variety for <i>ex situ</i> Conservation	Ramon L. Rivera Ernesto E. Emmanuel Susan M. Rivera Cristeta A. Cueto Carmen N. Lambanico Ma. Luz C. George	PCA



INSTITUTIONAL UPDATES





About BAR

Over the last two decades, the Bureau of Agricultural Research (BAR), being the country's national coordinating agency for agriculture and fisheries Research and Development (R&D), has been at the forefront of bringing relevant research results to benefit the Filipino people. More than funding and coordinating R&D in agriculture and fisheries, BAR provides better opportunities through increased production and incomes.

Given the various challenges including, globalization, new international trade environment, and climate change which greatly affects production, BAR supports the generation of information and

technologies that will lead to highly-competitive agriculture and fisheries sectors.

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

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

Awards and Recognitions



BAR receives institutional award from PAC

The Bureau of Agricultural Research (BAR) received recognition for its R&D support to the advancement of agricultural research in Pampanga Agricultural College (PAC) during its 36th Recognition Rites in Magalang, Pampanga, on 11 April 2011.

PAC credited BAR for its support to its sweet tamarind and sweet sorghum R&D which both gained recognition in the regional and national levels of the Civil Service Commission's (CSC) PAG-ASA Award in the recent years.

In his acceptance speech, BAR Director Nicomedes P. Eleazar commended PAC for developing the potentials of sweet tamarind and sweet sorghum as viable crops in the province. He lauded PAC's efforts to disseminate the technology of sweet tamarind production and processing which had tremendous impact because of the support of local government units on this project. The potentials of this crop have attracted the interest of farmers and have led to the emergence of opportunities in processing sweet tamarind in the province.

Moreover, Director Eleazar applauded PAC as it eagerly explored the potential of sweet sorghum as food, feed, and fuel source, which is one of the priorities of BAR under its biofuel feedstock development program. BAR also support PAC's publication of the compendium of recipes they developed using sweet sorghum as the main ingredient.

On behalf of PAC, President Honorio M. Soriano extended their gratitude to BAR during the recognition rites for its continuing support to the R&D programs of the agricultural college. ###

Awards and Recognitions

BAR-funded *Sapinit* project wins best paper award in 19th National Fruit Symposium

The project, “*Sapinit Production and Utilization Project*” of the Quezon Agricultural Experimental Station (QAES) bagged the first place in the Best Paper Award during the 19th National Fruit Symposium (NFS) held on 24-28 October 2011 at the Dep-Ed Ecotech Center in Lahug, Cebu City. The symposium, with the theme: “Harnessing Science and Technology towards a Dynamic and Sustainable Fruit Production” was organized by the Philippine Fruits Association (PFA) to recognize the valuable contributions of science and technology (S&T) in the fruit industry.

The project on *Sapinit* was funded by the Bureau of Agricultural Research (BAR) through its banner program, the National Technology Commercialization Program (NTCP) and supported under the DA-National Agricultural and Fishery Council (DA-NAFC) through the 2KR-Grant Assistance for Underprivileged Farmers (GAUF).

Sapinit (*Robus rosifolius*), a wild raspberry, is an indigenous plant native in Asia and thrives in Mount Banahaw. Its potential as a source of income by local farming communities paved way in developing cultural and management techniques, and the package of technology (POT) of *sapinit*.

During the presentation delivered by Mr. Dennis DL. Bihis of QAES, the beneficiaries' response in the project was very positive. This indicates that the interventions in the project were easily adopted by the beneficiaries and, thus effectively promoted its sustainability. Through the project, *sapinit* are now being processed into various products including: jam, juice, and wine. The packaging and label designs had been already created making the products more marketable. It was also observed that the use of organic fertilizer as part of the POT on *sapinit* has significantly increased the yield.

PFA is a non-profit organization which is mandated to reach out and rally the fruit growers, processors, traders, and researchers of the country into a unified organization making PFA a solid entity and a strong voice for the Philippine fruit industry. ###



Awards and Recognitions



NOMIARC receives CSC 2011 Pagasa Award

Exemplifying true and quality service to the public, the Northern Mindanao Integrated Agricultural Research Center (NOMIARC) received this year's Civil Service Commission (CSC) Pag-asa Award for Outstanding Work Performance (group category).

NOMIARC, together with other 30 state officials and employees, was recognized and awarded during the 2011 National Search for Outstanding Public Officials and Employees on 9 November 2011 at the Malacañang Palace. Bestowing the award was Executive Secretary Paquito Ochoa Jr., (representing President Simeon Aquino III), CSC Chair Francisco Duque III, and Commissioner Mary Ann Fernandez-Mendoza.

NOMIARC was awarded for its commendable achievements in the field of agricultural research and development (R&D), including the implementation of successful programs and projects that generated relevant technologies benefitting the farming communities in Region 10 and the whole country.

NOMIARC, as the nerve center of agriculture R&D in Region 9, plays an important role in generating various technologies on crops, livestock, and integrated farming systems. As an active partner of the Bureau of Agricultural Research (BAR) particularly in developing productivity-enhancing and cost-reducing technologies for farmers, BAR has been providing funding support to the various research activities that generated high-impact results including the Community-based Participatory Action Research (CPAR) which continues to build and promote integrated farming in rural communities in the region.

Given the accomplishments and recognitions, Center Manager Juanita Salvani remained humble and beholden. "The award is indeed an inspiration to the NOMIARC staff and its community and institutional partners in continuing to propel community-based initiatives that realize local agricultural development," she cited.

Awards and Recognitions



BAR caps 2011 with 5th Bright Leaf Award

Third time's a charm for the Bureau of Agricultural Research (BAR) as another writer bags an award during the 5th Bright Leaf Agriculture Journalism Awards held on 3 December 2011 at the Sofitel Philippine Plaza, Pasay City.

Twenty eleven closes perfectly for BAR as current managing editor of its publications and senior writer at the Applied Communication Division, Rita T. dela Cruz, bagged the Best Agricultural News Story (National) for her published article, “A coco plantation makes a good carbon sink - study”.

The Bright Leaf Agriculture Journalism Awards is an annual competition usually held during the last quarter of the year, with a mission to promote the Philippine agriculture by awarding authors of notable photographs and stories published throughout the country.

On her winning piece published in the Philippine Star on 3 April 3 2011, dela Cruz explained: “Climate change is a very timely topic. I think more than keeping the people aware on its (possible) adverse effects in the agriculture sector, there is also an urgent need to highlight more on the effective strategies and what the R&D sector can do to address this phenomenon”.

BAR writers who previously won the Bright Leaf were Mr. Edmon Agron for his article, “R&D: Efforts to Manage and Restore Sea Cucumber Population Underway” (2010 Best Agriculture Feature Story, national) published in BAR Chronicle and Ms. Miko Jazmine J. Mojica for her piece, “When Fish Catch a Cold, the Rest of the World Sneezes” (2009 Best Agriculture Feature Story, national) published in BAR R&D Digest.



Capacity Building (International Training)

Table 8. International training, workshop, seminar CY 2011

GRANTEES	AGENCY	EVENT	VENUE
Melissa A. Resma	BAR	Training on Promoting Innovation and Entrepreneurship through Incubation	India
Carmencita V. Kagaoan	BAR	17 th CABI Review Conference	United Kingdom
Fernando S. Sanchez	UPLB	Executive Programme on Greenery Planning and Management	Singapore
Joell H. Lales*	BAR	Governance Meeting of the Global Research Alliance Senior Officials Meeting on Agricultural Greenhouse Gases	France
Romulo Cena	USM	MRP-IRRDB Plant Breeder Seminar	Brazil
Fe L. Porciuncula*	CLSU	International Journal of Arts and Sciences (IJAS) Conference	Germany
Victoriano B. Guiam	BAR	CGIAR Fund Council Meeting & Ad Hoc Funders' Forum	France
Reivin Vinarao*	NFRDI	8 th IOC/WESTPAC International Scientific Symposium	Korea
Caridad Jimenez*	UPV	9 th Asian Fisheries and Aquaculture Forum	China
Bernardo S. Tad-Awan	BSU	Advance Spawn-making Technologies	USA
Teodoro S. Solsoloy	BAR	Regional Workshop on Climate Change and Food Security in the ASEAN +3 Countries	China
		International Conference -Greenhouse 2011: the Science of Climate Change	Australia
Carlos Baylon*	UPV	9 th Asian Fisheries and Aquaculture Forum	China
Teotimo M. Aganon*	CLSU	PICAT Project Assessment/Round Table Discussion-Intensive Vegetable Production	Israel
Salvacion M. Ritual	BAR	Conference on Climate Change, Agri-food, Fisheries, and Ecosystems: Reinventing Research Innovation and Policy Agenda for Environmentally and Socially Balanced Growth	Morocco
Leoncia B. del Mar	BAR	-do-	Morocco
Juliana C. Baylon*	UPV	9 th Asian Fisheries and Aquaculture Forum Special Session	China
Edna Oconer*	MSU, GenSan	3 rd Bio-Asia Regional Conference	Korea
Roger O. Bagaforo*	DA RFU IX	International Workshop on Climate Change and Natural Rubber Production: Carbon Trading Potential in Natural rubber Sector	Indonesia
Revin Vinarao	NFRDI	8 th International Conference on Molluscan Shellfish Safety	Canada

Capacity Building (International Training)

GRANTEES	AGENCY	EVENT	VENUE
Rosario Monsalud	UPLB	Training Course on long-Term Preservation and Management of Microbial Resources with Agricultural Importance	Thailand
Marian de Leon	UPLB	-do-	Thailand
Resurreccion Sabada	UPV	-do-	Thailand
Simeon C. Fernandez	DA RFU XI	Training Course on Environmentally Friendly Fertilizer Production, application and Demonstration for Developing Countries	China
Inez C. Gonzales*	BSU	2 nd International Symposium on Underutilized Plant Species “Crops for the Future-Beyond Food Security”	Malaysia
Dante B. Albarico	RFU VIII	2011 International Hybrid Rice Technology Training Course	China
Julia Lapitan	BAR	1 st International Conference on Food and Environment – the Quest for Sustainable Future	England
Emma Sales*	USM	IRRDB Biotechnology Workshop	Malaysia
Melissa A. Resma	BAR	Asian Food and Agriculture Cooperation Initiative (AFACI) Pan-Asian Project Meeting for the Establishment of Agricultural Technology Network in Asia	Korea
Edith M. San Juan	NFA	International Congress on Engineering and Food (ICEF)	Greece
Maria Nenita D. Campo	LGU-R.T. RomualdezAgusan del Norte	2011 International Hybrid Rice Technology Course	China
Heminigilda A. Gabertan	BPI-LBNCRDC	International Training Programme in Plant Breeding and Seed Production	Sweden
Nelita C. Alura	RFU VIII	International Seminar on Natural Resources, Climate Change and Food Security	Indonesia
Rodolfo Galang	BAR	Educational Visit to Vietnam	Vietnam
Marivic G. Begonia	RFU I	Training Workshop on Rapid Bioassay for Pesticide on Fruits and Vegetables for Market Inspection and Farm Education	Taiwan
Ligaya C. Santos	BAR	ASEAN-SEAFDEC Conference	Thailand
Rhona G. Dacillo	BAI	3 rd International Conference on Sustainable Animal Agriculture for Developing Countries	Thailand
Luisito Mariano	BAI	-do-	Thailand
Blesilda M. Calub	UPLB	17 th IFOAM Organic World Congress 2011 & INFO General assembly Meeting	Korea
Melani A. Provido*	RFU XI	Training Course on Natural Rubber Production and Processing Technology for Developing Countries	China

Capacity Building (International Training)

GRANTEES	AGENCY	EVENT	VENUE
Flora Jarilla	BPI-LBNCRDC	International Training Workshop on Breeding Technology of Horticultural Crops	China
Jessel F. Cadines*	RFU XI	-do-	China
Joan D. Bacbac*	RFU CAR	International Training Workshop on Breeding Technology of Horticultural Crops	China
Julie D. Tan*	VSU	International Conference of the International Union of Microbiological Studies (IUMS) 2011 Congress	Japan
Rodel Maghirang*	UPLB	Organic World Congress	South Korea
Norma U. Gomez*	USM	7 th Asian Society of Agricultural Economists (ASAE) International Conference	Vietnam
Erlinda G. Gadon	RFU IX	8 th China-Asean Expo (CAEXPO)	China
Arturo O. Manipon*	CLSU	International Training Workshop on Breeding Technology of Horticultural Crops	China
Cristina Gragasin	PhilMECH	Annual International Conference for Methyl Bromide Alternatives and Emissions Reductions	California
Cecilia Gascon*	SLSU	Administrators' Study Tour on Commercial Beekeeping	Winnipeg, Canada
Aida D. Solsoloy	RFU 1	ISSAAS Symposium and Congress	Indonesia
Juliana A. Calixto	RFU 1	-do-	Indonesia
Femina T. Rivera*	CLSU	Transition Training Workshop for Climate Change Adaptation	Thailand
Amulfo M. Mascarinas	BU	ISSAAS International Symposium & Congress	Indonesia
Sharon E. Lazaro*	CLSU	International Training Workshop of Botanic Extracts Processing Technology	China
Teodoro S. Solsoloy	BAR	Regional Office of Diversity International	Malaysia
Salvacion M. Ritual	BAR	IRRDB Annual Meetings and International Natural Rubber Conference	Thailand
Cecilia B. Pascual	UPLB	11 th Asian Maize Conference	China
Ricardo F. Orge*	PhilRice	International Conference on Sustainable Development	Malaysia
Tessie A. Boncato*	TCA	ISSAAS Symposium and Congress	Indonesia
Noemi R. Villaverde	SLSU	IRRDB International Rubber Conference	Thailand
Angelina T. Gonzales	DMMMSU	Congress of International Sericulture Commission	Thailand
Romulo Cena	USM	IRRDB International Rubber Conference	Thailand
Jesus Antonio Derije	USM	IRRDB International Rubber Conference	Thailand
Asuncion Nagpala*	BSU	ISSAASS Conference	Indonesia
Rita dela Cruz	BAR	APEC Agricultural Technology Transfer Forum	China

Capacity Building (International Training)

GRANTEES	AGENCY	EVENT	VENUE
Rodolfo Galang	BAR	Global Rubber Conference	Pnom Penh
Rodolfo Fernandez	BAR	-do-	Pnom Penh
Louella Lorenzana*	RFU4B	ISSAAS International Symposium and Congress	Indonesia
Orlando Balderrama	ISU	Short Course on Cropping System Models Applications in Land Resource Management	ICRISAT
Elvira Torres*	RFU 8	3 rd Engaging with Vietnam: An Interdisciplinary Dialogue Conference	Vietnam
Rolando Niez	RFU 8	-do-	Vietnam
Jennifer Remoquillo*	DA	China ASEAN Training Program on Agro Product Processing Technology	China
Virgie Callo Etis*	URS	ISSAAS	Indonesia
Januel Floresca*	ISU	ISSAAS	Indonesia
Alfredo Cayabyab	RFU XI	IRRDB International Rubber Conference and Annual Meeting	Thailand
Luz R. Marcelino	RFU 5	ISSAAS	Indonesia
Corazon Orbon	RFU 5	ISSAAS	Indonesia
Emmanuel Oroyo	RFU 5	ISSAAS	Indonesia
Milo delos Reyes	DA	Training and Capability Building Program on Organic Agricultural Research and Production for DA Regional Officers (1st Batch)	Myanmar/ Thailand
Edgardo Rubio	DA	-do-	
Zaldy Boloron	RFU XII	-do-	
Vilma Dimaculangan	RFU 4A	-do-	
Apolonia Mendoza	BAR	-do-	
Jude Ray Laguna	BAR	-do-	
Carmencita Kagaoan	BAR	-do-	
Felizardo Salomes	RFU 9	Training and Capability Building Program on Organic Agricultural Research and Production for DA Regional Officers (2nd Batch)	Lao PDR/ Thailand
Eduardo Lomerio	RFU 5	-do-	
Richardo Saltin	RFU 6	-do-	
Alexander Arizabal	BAR	-do-	
Ricarte Castro	BAR	-do-	
Orlando Lorenzana	RFU 2	-do-	
Dinah Marie Dayag	BASC	1 st International Training Course on Pigeon Pea	India
Sylvia Minda Dargantes	MSU	-do-	
Joseph Ngohayon	IFSU	-do-	
Emilio dela Cruz	CLSU	-do-	
Crisologo Doria	BISU	-do-	
Chris Maarat	USM	-do-	

Capacity Building (International Training)

GRANTEES	AGENCY	EVENT	VENUE
Melissa A. Resma	BAR	Expert Workshop for Agricultural Technology Network	Lao, PDR
Ernie Camacho	RFU IX	IRRDB International Rubber Conference	Thailand
Roger Bagaforo	RFU IX	IRRDB International Rubber Conference	Thailand
Roselyn F. Paelmo	UPLB	IRRDB International Rubber Conference	Thailand
Esther Botangen	BSU	ISSAAS International Symposium and Congress	Indonesia
Manuelo V. Agsaoay*	TCA	ISSAAS International Symposium and Congress	Indonesia
Jovita Datuin*	DA RFU 1	ISSAAS	Indonesia
Cathy Pastor*	DA RFU I	ISSAAS	Indonesia
Bonifacio Cayabyab	UPLB	Asian Maize Conference	China
Nina Kathleen Galang	UP Manila	2nd ICEEC 2011	Malaysia

Capacity Building (Local Training)

Table 9. Local training, workshop, seminar CY 2011

Grantees	Agency	Event	Venue
Romeo V. Labios	UPLB	21 st FCSSP Conference	Albay
Apolonio M. Ocampo	UPLB	-do-	Albay
Bryan V. Apacionado	UPLB	21 st Scientific Conference	Legaspi
Maria Charito E. Balladares	UPLB	-do-	Legaspi
Ryan Rodrigo P. Tayobong	UPLB	-do-	Legaspi
Amavel Velasco	BAR	SEARCA Online Course on Responding to Climate Risks in Agriculture and Natural Resource Management	UPLB
Marnelie Gadong	BAR	-do-	UPLB
Jay Invinsor	BAR	-do-	UPLB
Ernie Camacho	DA RFU IX	National Agroforestry Conference	PAC

APPENDICES



Directory of BAR Officials (CY 2011)

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Acronyms

2KR	Kennedy Round 2
ADB	Asian Development Bank
ACIAR	Australian Centre for International Agricultural Research
ACD	Applied Communications Division
AVRDC	The World Vegetable Center
ADP	Agribusiness Development Projects
AFACI	Asian Food and Agriculture Cooperation Initiative
AFRDIS	Agriculture and Fisheries Research and Development Information System
AFMA	Agriculture and Fisheries Modernization Act
AFPRU	Agriculture and Fisheries Policy Research Unit
ARMMIARC	Autonomous Region in Muslim Mindanao Integrated Agricultural Research Center
ATI	Agricultural Training Institute
BAI	Bureau of Animal Industry
BAR	Bureau of Agricultural Research
BASC	Bulacan Agricultural State College
BIGFIS	Bicolandia Greenfields Development Organization
BFAR	Bureau of Fisheries and Aquatic Resources
BPI	Bureau of Plant Industry
BSWM	Bureau of Soils and Water Management
BU	Bicol University
CARIARC	Caraga Integrated Agricultural Research Center
CLIARC	Central Luzon Integrated Agricultural Research Center
CLSU	Central Luzon State University
COGENT	Coconut Genetic Resources Network
CPAR	Community-based Participatory Action Research
CRGM	Competitive Research Grant Manual
CSO	Civil Service Organization
CSSP	Crop Science Society of the Philippines
DA	Department of Agriculture
DFIMP	Diversified Farm Income Market Development Project
DMMMSU	Don Mariano Marcos Memorial State University
DOST	Department of Science and Technology
DRTS	Document Recording and Tracking System
EDTRS	Employee's Daily Time Recording System
EO	Executive Order
EVIARC	Eastern Visayas Integrated Agricultural Research Center
FCDF	Farmers' Community Development Foundation, International
FIDA	Fiber Industry Development Authority
FSSP	Food Self-Sufficiency Program
GAP	Good Agricultural Practices
GEF	Global Environment Facility
GIS	Geographic Information System
GMA	Ginintuang Masaganang Ani

Acronyms

HIP	High Impact Projects
HRDP	Human Resource Development Program
HVCDP	High Value Crops Development Program
ICRISAT	International Crops Research Institute for the Semi-arid Tropics
ICT	Information and Communication Technology
ICTS	Information Communication Technology Section
IDG	Institutional Development Grant
IDU	Infrastructure Development Unit
IEC	Information, Education and Communication
IHRMIS	Infrastructure and Human Resource Monitoring Information System
INIBAP	International Network for the Improvement of Banana and Plantain
INM	Integrated Nutrient Management
IP	Intellectual Property
IPHW	Indigenous Plants for Health and Wellness
IPM	Integrated Pest Management
IPO	Intellectual Property Office
IPGRI	International Plant Genetic Resources Institute
IPMIS	Intellectual Property Management Information System
IRRDB	International Rubber Research and Development Board
ISO	International Standards Organization
ISU	Isabela State University
JICA	Japan International Cooperation Agency
LDC	Livestock Development Council
LGU	Local Government Units
LSU	Leyte State University
MBCR	marginal benefit-cost ratio
MinSCAT	Mindoro State College of Agriculture and Technology
MISD	Management Information System Division
MMSU	Mariano Marcos State University
MOA	Memorandum of Agreement
MSI	Marine Science Institute
MTA	Material Transfer Agreement
M&E	Monitoring and Evaluation
NAFC	National Agricultural and Fisheries Council
NBN	National Broadcasting Network
NNC	National Nutrition Council
NaRDSAF	National Research and Development System for Agriculture and Fisheries
NARTDI	National Apiculture Research, Training and Development Institute
NIRDEAP	National Integrated Research and Development Extension Agenda and Programs
NGO	Non-government Organization
NRC	National Research Centers
NRDP	National Rubber Development Program

Acronyms

NRS	National Research Symposium
NTCP	National Technology Commercialization Program
OA	Organic Agriculture
OAS	Outstanding Agricultural Scientist
OFR	On-Farm Researchers
PAES	Palawan Agricultural Experiment Station
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PCA	Philippine Coconut Authority
PCC	Philippine Carabao Center
PhiRARDEP	Philippine Rainfed Agriculture Research and Development and Extension Program
PICC	Policy and Implementation on Climate Change
PIM	Pre-implementation Meeting
PMED	Project Monitoring and Evaluation Division
PNOC	Philippine National Oil Company Alternative Fuels Corporation
PRA	Participatory Rural Appraisal
PO	Private Organization
PPDD	Planning and Program Development Division
PoT	Package of Technology
PTMIS	Proposal Tracking Monitoring Information System
RDE	Research and Development and Extension
RDEAP	Research and Development, Extension Agenda and Programs
RDMIS	R&D Management Information System
RFRDC	Regional Fisheries Research and Development Center
RFU	Regional Field Unit
RIARC	Regional Integrated Agricultural Research Centers
RFRDC	Regional Fisheries Research and Development Center
RRDEN	Regional Research and Development Network
ROS	Research Outreach Station
R&D	Research and Development
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SEMS	Scholarship Evaluation and Monitoring System
SKSU	Sultan Kudarat State University
SLSU-JGE	Southern Luzon State University-Judge Guillermo Eleazar
SMIARC	Southern Mindanao Integrated Agricultural Research Center
SNAP	Simple Nutrient Addition Program
SPG	Special Publication Grants
SUCs	State Universities and Colleges
SPPEMS	Supplies, Property, Plant and Equipment Monitoring System
TCD	Technology Commercialization Division
ToT	Training of Trainers
TWG	Technical Working Group

Acronyms

UNDP	United Nations Development Programme
UPD	University of the Philippines Diliman
UPLB	University of the Philippines Los Baños
URS	University of Rizal System
UPV	University of the Philippines Visayas
USM	University of Southern Mindanao
VDTMS	Vehicle Dispatching and Trip Monitoring System
VSU	Visayas State University
WOA	Weaves of Asia
WESMIARC	Western Mindanao Integrated Agricultural Research Center
WESVIARC	Western Visayas Integrated Agricultural Research Center
ZRCFAF	Zonal Research Centers for Agriculture and Fisheries



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