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TAKING THE HIGH ROAD TO INNOVATION

DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL RESEARCH

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SEEDS OF INNOVATION

Mid-2010 was a period of some uncertainty with the change in administration and the appointment of a new Secretary of Agriculture. As with other DA agencies, BAR found itself briefly off the beaten path. But having been through previous times of change, the bureau quickly regained its bearings and made the right adjustments. The bureau transitioned, seamlessly as it knew that increased production and food self-sufficiency remained to be the far-end target that must be achieved at the soonest. In taking on new initiatives, BAR took bold steps and the high road of innovation in the process. Our institutional accomplishments in 2010 show this much.

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Innovation is...
the ability to see change as an
opportunity and not a threat.

DR. NICOMEDES P. ELEAZAR, CESO IV
DIRECTOR

TAKING THE HIGH ROAD OF INNOVATION

In taking on new initiatives, BAR took bold steps and the high road of innovation in the process.

Internationally recognized business leader, author, and inspirational speaker, Billy Cox, once said that in order for us "to stay motivated, we must be working for a purpose," making sure that every decision made will not only make a difference, but is right and is for the greater good.

In mid-2010, a period of some uncertainty amid the change in administration and the appointment of a new Secretary of Agriculture, the Department got tested on this mantra. As with other DA agencies, BAR found itself briefly off the beaten path. However, having itself gone through previous periods of change, any pause that may have been on the part of BAR during the interregnum was short-lived. The bureau seamlessly transitioned from the FIELDS program of former Secretary Arthur C. Yap to the *Agri-Pinoy* (Agrikultura Pilipino) of Secretary Proceso J. Alcala as it has always known that increased production and food self-sufficiency remain the unchanging targets that must be achieved under whatever administration is in place.

In spearheading new initiatives, BAR took bold steps onto the high road of innovation in the process of doing so. Our institutional accomplishments in 2010 show this much. We partnered with international R&D organizations, maintaining and expanding local collaborations with them, particularly on championing of projects and programs nationwide on agrobiodiversity, on adopting and promoting high-quality crop varieties, and in addressing food security in general.

In the same manner, BAR picked up speed in biotechnology development by supporting basic biotechnology research for developing the bio-industry for natural ingredients as well as applied biotechnology for improving crop yield, resistance to pests, and adaptation to climate change. We also

intensified support to agri-biotechnology R&D to hasten agricultural productivity that directly increases farmers' incomes, provides access to nutritious and safer food, and helps achieve a healthy environment.

In 2010, BAR assumed even greater responsibility in enhancing food security by supporting a multi-sectoral collaborative RDE project with UPLB, particularly in rice self-sufficiency, that has engaged and empowered both farmers and LGUs to make their contributions in the national endeavor. With the DA's calls for unity to attain the country's goal on national food security, the partnership was a most welcome initiative to Agriculture Secretary Proceso Alcala who has been tirelessly urging all stakeholders in the agriculture and fisheries sectors to come together to renew Philippine agriculture.

In taking the high road, maintaining the right people and equipping them with the right skills to handle special tasks are also important factors for success. BAR saw the importance of enhancing the capability of research managers to better prepare them for crafting plans and strategies for implementation. Towards this end, BAR, in 2010, partnered with SEARCA for assistance in implementing and administering a one-year capability building program on adapting to climate change. Towards this end, SEARCA conducted a series of training activities for research managers, researchers and technical staff from the national and regional offices of DA.

Another milestone was the forging of partnerships for increased market potentials and knowledge-learning market initiatives through partnerships under NEDA-PEP and IFAD. BAR participated in the NEDA-PEP and IFAD two-day product exhibit and knowledge-learning market initiative, wherein the bureau showcased five products developed under the NAFC-BAR project "Technology Management for Competitive Agriculture and Fisheries Sector."

BAR sustained the momentum of its two banner programs, CPAR and NTCP, as it continued what was started in the previous years by supporting and funding more projects that benefit more communities in the marginalized sector. In 2010, the CPAR program of BAR established a new record of 176 projects coordinated that provide benefits to 8,794 farmers all over the country and which constitutes a big leap from the 89 CPAR projects and 7,046 beneficiaries in 2009. Of these 176 CPAR projects, 89 percent (157 projects) are on agriculture while 11 percent (19 projects) are on fisheries. The same could be said for the NTCP which took the bureau to new heights. BAR displayed greater resolve as it took bold steps towards reforming the R&D system in order for its products to be more efficiently commercialized.

With NAFC-2KR funding, the bureau supported 27 projects with 12 projects for crops; seven on livestock/poultry; three on rubber; two on PBME; and one project each for fishery, biofuel and apiculture (beekeeping). For 2010, five projects were added. Furthermore, 11 new projects were funded under the HVCCP.

Given these accomplishments, we feel that we will be able to do more in the coming years. After all, innovation is a never-ending quest for discovery and improvement. However, in the things that we achieved in 2010, we do not take sole credit as these gains would not have been possible were it not for the unceasing and unwavering support of our partners in R&D.

DR. NICOMEDES P. ELEAZAR, CESO IV
Director

INSTITUTIONAL ACCOMPLISHMENTS

FOREIGN-ASSISTED PROJECTS:

Pushing the Right Buttons for a Successful Partnership Journey

Organizations of all kinds know that to achieve success in its endeavors, it is often necessary to pool the help of other organizations as capable partners in achieving a similar goal. In agricultural research, international organizations who either have advanced skills or knowledge or the resource-sourcing capability to support agriculture R&D institutions and stakeholders in various countries are important allies of BAR in creating a significant impact in local agriculture development through R&D.

To this end, BAR continues to maintain and expand its good relationship and collaboration with important international organizations, particularly those under CGIAR such as the World Fish Center and ICRISAT, to name a few. In the recent years, these two organizations in particular, are proving to be close and reliable partners of BAR in championing projects and programs nationwide. The year 2010 demonstrated this agreeable relationship through the successful implementation of inter-organizational collaborations specifically in biodiversity, adopting high-quality crop varieties, and addressing food security.

Biodiversity

To assist LGUs in critical biodiversity areas of the Philippines in incorporating the conservation and sustainable use of biodiversity resources, the first stakeholders' workshop to develop the project titled, "Partnerships for Biodiversity Conservation: Mainstreaming in Local Agricultural Landscape" GEF funding was held on 14-15 January 2010 in Quezon City. Representative organizations that gathered to level-off on the project concept, confirm baseline situation and agree on the project strategy were from BAR, DENR, Regional Offices, UPLB, DILG, Haribon Foundation, PhilConserve, CI Philippines, Flora and Fauna International, and other national conservation NGOs.

The outcomes expected were: 1) to come up with a national system and policy to support the conservation of biodiversity in local development planning such as agriculture; 2) local government units encompassing at least 800,000 hectares in five key ecosystems have the tools and capacities to integrate sustainable management into decentralized government structures; and 3) reducing threats to biodiversity across at least 10,000 sq. km of landscape in five key biodiversity areas. The identified sites are different points of Luzon such as Palawan and Mindoro, Negros-Panay in the Visayas, and different points in Mindanao.

The project aimed to enhance the standards and certification schemes in promoting biodiversity-friendly production systems focusing

on agricultural production, wildlife breeding, and forest products. For its part, BAR focused on the development, promotion, and utilization of oft-neglected but important indigenous vegetables, tropical fruits, indigenous rice, and local herbs and spices. Another workshop was likewise held to develop and package the necessary implementation arrangements, budget, and activity schedules before the project document was formally submitted for the approval of the GEF Council.

ICRISAT-developed crops showed promising results

Dry-tolerant but high-yielding varieties of peanut, pigeonpea, and chickpea developed by ICRISAT were found to thrive well in Philippine soil. This was the result of the first-year trial of the project titled, "Field Testing of ICRISAT Legume Varieties and Technologies in Selected Regions of the Philippines" funded by BAR. With the introduction of these new crops, the project aimed to develop alternative crops that would help Filipino farmers cope with increasing dry spell events in the country and address food inadequacy in the rural areas. The project tested several varieties of peanut, pigeonpea (*kardis* or *kadyos*), and chickpea (*garbanzos*) for their suitability under local conditions in seven pilot regions, namely: Regions 1, 5, 6, 7, 8, 9, and 10.

In the peanut adaptability yield trial, *ICGV 00350* and *ICGV 99046* peanut lines were consistent high yielders among the four ICRISAT entries evaluated. These two promising selections significantly out-yielded most of the national and local check varieties (*NSIC Pn 11, NSIC Pn 12, NSIC Pn 14,* and *NSIC Pn 15*) in almost all the test stations. The two promising lines will be considered for further yield and adaptability tests on-station and on-farm to obtain more reliable results for inclusion as test entries under NCT in the Philippines. In the adaptability trial for pigeon pea, four genotypes (*ICPL 88034, ICPL 88039, ICPL 81,* and *ICPL 161*) successfully produced pods in all locations where the lines were tested. Seed yield range was 0.87-1.28 t/ha. Meanwhile, the adaptability yield trials for chickpea showed encouraging results for chickpea production, particularly in trials conducted in Northern Mindanao. Initial results revealed similar performance of the introduced chickpea with those in Benguet Province and noted that the agro-climatic condition is ideal for chickpea production. The Philippines import about 735 tons of chickpea per year (valued at US$ 442T or P20M) to meet local demand for *garbanzos*.

If found stable in producing high yield in the succeeding yield trials, these breeding lines can be included in the national screening, preliminary to their introduction to farmers nationwide.

CGIAR Mega Programs highlights aquatic agricultural systems for the poor

The World Fish Center tapped BAR's involvement in one of the mega programs of CGIAR titled, "Harnessing the Development Potential of Aquatic Agricultural Systems for the Poor and Vulnerable," also known as Mega Program 1.3. The program, which addresses the aquatic agricultural systems for the poor and vulnerable, is envisioned to focus on improving the lives of 50 million people through development pathways that harness the full potential of aquatic agricultural systems by strengthening the capacity of smallholder producers and landless poor, and harnessing other development benefits from these systems.

In preparation, The WorldFish Center-Philippine Office, under the supervision of Dr. Maripaz L. Perez, regional director for Asia and country manager, organized a "Program Consultation Writeshop" on 12-13 August 2010 at the WorldFish Country Office in SEARCA, College, Los Baños, Laguna attended by stakeholders including BAR, DOST, PCARRD, PCAMRD, SEAFDEC, and UPV. The concept of the Mega Program 1.3, initially presented by Dr. Maripaz L. Perez to BAR Dir. Nicomedes P. Eleazar and to several BAR officials and staff on 3 August 2010, has the support of the bureau since it is in line with its R&D thrusts and agenda programs.

The Consortium of the CGIAR Centers established the mega-program portfolio to coherently address key agricultural development challenges. It was designed specifically to increase food security, environmental sustainability and poverty alleviation. The Philippines was selected as one of the components of the program that includes the Asia mega deltas, the Coral triangle region of Asia Pacific, and the African freshwater system.

Optimizing the potentials of roots, tubers, and bananas for food security

To address world challenges on food security and increasing farmers' income, BAR was involved in another mega program of the CGIAR titled, “MP3: Roots, Tubers, and Bananas for Food Security and Income Mega Program or RTB MP”. In line with this, the International Potato Center (CIP) conducted a "Stakeholders' Consultation Workshop on the Consultative CGIAR Research Programs on Roots, Tubers, and Bananas." BAR, as the national coordinator of agriculture R&D, along with other delegates from the government and private sectors, local government units, academe, and research institutions took, part in the workshop which was held on 12 August 2010 at PCARRD, Los Baños, Laguna.

Under MP3 is MP3.5 that covers rootcrops, bananas, and plantains with four centers of CGIAR leading this initiative, namely: Bioversity International on livelihood programs for bananas and plantains; International Center for Tropical Agriculture (CIAT) on cassava; Agricultural Research for Development in Africa (IITA) on yams; and CIP on sweet potato, potato, and Andean roots and tubers.

The collaboration of participating stakeholders contributed new areas on R&D focusing on priority research themes of RTB MP specifically on : 1) conserving and accessing genetic resources; 2) accelerating the development, delivery, and adoption of varieties with stable yields, stress resistance, and high nutritional value; 3) managing priority pests and diseases and beneficial microbial communities; 4) promoting sustainable systems for clean planting materials for farmers; 5) developing tools for more productive and ecologically robust crops; and 6) enhancing postharvest technologies and adding market value.

CGIAR has been trying to synergize all its centers and thus attract more funding for research. The workshop was also held to align and complement the research design with those of other Southeast Asia partners. The collaboration of participating stakeholders contributed new areas on research and development (R&D) focusing on priority research themes of RTB MP.

PICKING UP THE SPEED IN BIOTECHNOLOGY

Specific biotechnology applications are now reaping benefits for the agriculture sector

The Philippines has the right tools, proper environment, motivated entrepreneurs, and knowledgeable scientists to advance biotechnology, according to DA Undersecretary Segfredo Serrano. Biotechnology, or technology based on biology, agriculture, food science, and medicine, remains an "uncharted territory" which the country should cash in on as it is believed to have big market potential all over the world.

BAR has been supporting the DA-Biotechnology Project Implementation Unit (PIU) in funding priority R&D projects and activities of the different agencies within the DA and other stakeholders in biotechnology R&D such as the NAST, UPLB-BIOTECH, SUCs, and private organizations, including the SPA Association of the Philippines, BCP, and CHIPI. For 2010, DA and BAR supported the harnessing of biotech in developing the bio-industry for natural ingredients as well as applied biotech for improving crop yield, resistance to pests, and adaptation to climate change.

Specific biotechnology applications that are now reaping benefits for the agriculture sector include: 1) microbial fertilizers/biofertilizers and microbial pesticides; 2) tissue-culture in crops, medicinal and ornamental plants; 3) tissue-culture in crops, medicinal and ornamental plants; 4) animal vaccines; and 5) diagnostic kits for pathogens and toxins.

Intensifying support to agri-biotechnology R&D

To develop and promote the adoption of new production and postharvest technologies to increase productivity and profitability of selected agricultural commodities, at the same time minimizing the environmental impact of farming and fishery practices to effectively manage biodiversity, and help develop science-based policies, BAR intensified its support to agri-biotech R&D program. The idea is to fast track agricultural productivity that positively and directly increases farmers' incomes, provides access to nutritious and safer food, and helps achieve a healthy environment.

The R&D plan for biotechnology included: 1) genetic engineering to develop transgenics with protection against pest and diseases and improved agronomic traits; 2) creating an updated knowledge base on the genomes of major crops such as coconut, mango, and abaca; 3) developing biologics for early detection and control of pests and diseases; 4) science-based formulation of policies pertaining to biotech products; and 5) increase public awareness on biotechnology.

Currently, BAR is funding eight biotech projects which are being implemented by SUCs and partner-agencies. *(see Table 1)*

Table 1. BAR-Funded Projects on Biotechnology RDE.

TITLE OF PROJECT	AGENCY	DURATION
1. Development of Virus-Resistant Abaca Cultivars (*Musa textiles* Nee) Using Modern Biotechnology	FIDA	2007-2012
2. Development of Molecular Marker Kit for Identification and Authentication of Rubber (*Hevea brasiliensis*) Clones (Molecular Marker Kit for Identification and Authentication of *Hevea* Clones)	USM	2008-2010
3. Applied Animal Biotechnology for the Improvement of Philippine Mallard Duck	UPLB	2008-2011
4. Isolation and Structure Elucidation of Antimicrobials from the Leaves of the Philippine Trees *Premna odorata Blanco* and *Mangifera caesia*	MSU-IIT	2009-2011
5. Somatic Embryogenesis and Plantlet Regeneration from Cell Suspension Cultures of Abaca (*Musa textiles* Nee) and Banana (*Musa* sp.) for Development of Cultivars with Resistance to Virus Diseases	UPLBFI	2009-2010
6. Biotechnological Production of High-Value Products from Wastes of Mango Processing Industry Phase II	UPLBFI	2009- 2010
7. Utilization of Coconut Oil Industry By-products for the Biotechnological Production of High-Value Products Phase II	UPLBFI	2009- 2010
8. Somatic Embryogenesis from Cell Suspension Cultures of Banana (*Musa* sp.) and Somatic Embryo Germination and Regeneration in Banana and Abaca (*Musa textiles* Nee) Phase II	UPLBFI	2010- 2010

International training on biotechnology

BAR, in partnership with the GlobeTek Science Foundation, sent four delegates from UPLB, BFAR-NFRDI, and BAR to the University of California (UC) Davis for training on biotechnology. The training program was held in July-August 2010 and was composed of two parts. The first part, a formal training on Proteomics and Flow Cytometry, was conducted at the UC Davis campus and gave the participants a theoretical background on proteomics and flow cytometry as biotechnology tools and their applications in agriculture and fisheries. Part two of the training program was a combination of laboratory lessons and hands-on training on laboratory procedures and other basic biotechnology tools such as mammalian cell culture, DNA analysis, immunological techniques, and others. These were done at University of California Los Angeles (UCLA) and at the GlobeTek Science Foundation laboratory. The training is part of a biotechnology program implemented by the GlobeTek Science Foundation (formerly Pacific Rim Foundation for Advanced Technology Transfers, Inc.) which aimed to help the Philippines maximize the use of biotechnology advances for the country's agriculture sector.

Potential applications of the procedures and tools learned by the trainees include analysis of GMOs, genetic characterization of species and variant organisms, identification of genetic mutations for genomic characterization, genetic expression, and genetic products, and identification of genetic mutations, variants, and many more.

ASSUMING RESPONSIBILITY TO DRIVE FOOD SECURITY

Stakeholders in the agriculture and fisheries sectors are encouraged to come together to address hunger and poverty.

Calling for unity to attain the country's goal on national food security, Agriculture Secretary Proceso J. Alcala encouraged stakeholders in the agriculture and fisheries sectors to come together and renew Philippine agriculture.

Upholding this call as one of its ways to address hunger and poverty, BAR supported a collaborative RDE project with UPLB on food security, particularly rice self-sufficiency, in order to empower both farmers and LGUs to make their contributions in this endeavor.

Collaborative RDE for food security and rice self-sufficiency

Through the BAR-funded program, "Collaborative Research, Development, and Extension Services (CRDES) for Food Security: The Case of Region 4A, 4B, and 5," UPLB conducted the regional partnership action planning for Regions 4A, 4B, and 5 which served as the occasion for UPLB resource persons to explain the whole concept of the CRDES program and formalize RDE collaboration among the involved institutions. Two activities were held for this purpose on 21 January 2010 in Malvar, Batangas for Regions 4A and 4B, and in Naga City on 9 February 2010 for the Bicol Region.

Under a collaborative framework, the UPLB CRDES Program Management Unit also initiated two regional MOU signings among BAR, the two DA-Regional Field Units (Regions 4A and 4B), and PLGUs and SUCs in Region 4. The action planning likewise served as a venue for the farmers and LGU partners to air their concerns regarding rice production in their province or municipality.

The program highlighted the importance of extension service delivery and technology transfer to farmers as keys to addressing food security, specifically, rice self-sufficiency. It is hoped that, through the program, a strong partnership and exchange of knowledge and information for the rice industry's success will be generated.

The UPLB-led project focused on four concerns, namely: provide technical assistance to the regions, work with BAR in the implementation of CPAR program focusing on rice-based farming system, implement capacity-building programs for the LGUs and SUCs, and provide areas to be used for seed production activities. The program is anchored on four major components, namely: 1) Quick Response Studies to identify production constraints of rice and other crops in order to come up with solutions to improve productivity; 2) Capacity building of and partnerships with LGUs, SUCs and CSOs; 3) Functional support services in the areas of diagnostics, seeds, and soil fertility; and 4) Collaborative field researches in socio-economics, policy, and governance.

These components were expected to enhance the study sites' geophysical aspect, resources, access to technologies, institutional arrangements, and governance that will contribute to achieving provincial rice self-sufficiency. In this program, the project functions served as the catalyst for collaboration while, the LGUs and SUCs are the main implementers.

Adlai R&D Program as response to food security

Warnings have been raised over food security in the Philippines as various weather-related phenomena inflict damage across vast agricultural areas, leaving staple food crops dying in parched earth. In view of developing climate-friendly technologies to sustain food production, amidst the country's chronic insufficiency as far as palay is concerned, the Department of Agriculture has looked into the availability of alternative food crops, one of which is Adlai.

Adlai, (*Coix lacryma-jobi* L.) a freely branching upright herb that grows as tall as three feet and propagates through seeds, is seen as a good alternative to rice and corn. Known also as "Job's Tears" due to the tear-like shape of its grains, which come as white or brown, it belongs to the family Poaceae or the grasses, the same family to which wheat, corn and rice belong. Adlai is at least 50 percent starch, 14 percent protein and only 6 percent fat. Adlai's leaves are 10-40 cm long, 2.5-4 cm wide. Its spikes are from 6 cm to 10 cm long, erect and peduncled, while the male spikelets are about 8 mm long. Grains are usually harvested from four months to five months after sowing. Grains are separated from the stalks through threshing like rice and the seeds are first sun dried before milling. It is claimed to have medicinal properties, and is likewise used as source of body-enhancing materials. Seeds of the hard-shell type are used for ornaments such as beads for necklaces, bracelets, rosaries, and other similar products.

Looking into the potential of this food crop, BAR crafted the R&D roadmap for Adlai particularly its development, promotion, and utilization to sustainably nurture and enhance it as an alternative food source for the Filipinos. BAR collaborated with two NGOs: Earthkeepers and Masipag; four RIARCs: STIARC, CVIARC, BIARC and NOMIARC; one research station: QAES; and five SUCs: ISU, SLSU, CBSUA, CNSC, and CMU to further explore the potentials of Adlai. Researchers from the different partner institutions determined the adaptability of the available varieties/strains of Adlai. A POT on cultural management practices, postharvest/processing and seed production systems were developed as well as food products and other by-products from the plant. Implementers promoted the uses of Adlai both as food and feed. Crop adaptability trials cum seed productions were being initiated in all RIARCs and SUCs.

As a result of the field trials, promising Adlai strains/varieties are recommended for NSIC registration. Recent activities under the Adlai R&D Program included the conduct of the training cum planning workshop held in Manolo Fortich, Bukidnon in September 2010 where focal persons from various partner institutions trained on Adlai production. They also developed various food products out of Adlai including *sinaing*, *maja blanca*, and *sinukmani*. In December 2010, another planning-meeting on Adlai R&D was held at BAR with Agriculture Secretary Proceso J. Alcala gracing the activity.

ENHANCING CAPABILITY OF RESEARCH MANAGERS TO TO RESPOND TO CLIMATE CHANGE

Climate change is a wake-up call for the R&D sector, encouraging researchers and research managers to rethink views and perspectives on agriculture, not only in terms of food security, but also for farm profitability.

Under a climate change regime, global warming, unpredictable rainfall patterns, floods, and droughts impact on food security and agricultural productivity which affect the capacity of a country to feed its people and generate adequate quantity and acceptable quality of crops.

Climate change is a wake-up call for the R&D sector, encouraging researchers and research managers to rethink views and perspectives on agriculture, not only in terms of food security, but also for farm profitability. There is a need to combine protection, rehabilitation, and development of resources in a sustainable manner. In order to maximize the use of R&D resources, focus must be on improved and innovative management—a task that BAR has taken into full account.

In taking the high road, maintaining the right people with the right skills to handle a particular task is an important factor for the success of any R&D institution. In addressing the challenge of climate change, BAR takes into consideration first the importance of enhancing the capability of research managers to better equip them in crafting plans and strategies for implementation. In stepping up to the peak and pressing change, in 2010, BAR spearheaded the formulation of the Climate Change RDE Program to provide guidance on appropriate mitigation and adaptation research and extension efforts for agriculture and fisheries to strategically respond to climate change.

Capability building on climate change

To equip the researchers and research managers, information- and knowledge-wise, BAR requested SEARCA to provide assistance to implement and manage a one-year capability-building program related to climate change. BAR coordinated the implementation of the program and provided assistance to SEARCA in the conduct of training activities for research managers, researchers, and technical staff from the national and regional offices of DA. The first and second in-country short-term training courses titled, "Responding to Climate Change through Research and Development in Agriculture" were held at the SEARCA in Los Baños, Laguna in March and June 2010.

The short-term training aimed to strengthen initiatives on research and technology development, technology management, and their effective implementation and more importantly, the transfer and adoption by stakeholders. Specifically, the capacity-building project aimed to:

- update the knowledge and learning of DA research managers and researchers, including LGU personnel and farmers, on climate change concepts and related issues;
- impart among the participants the understanding of climate change and its consequences in agriculture, forestry, and fishery;
- impart analytical tools in the conduct of climate change vulnerability assessments;
- strengthen local and international partnerships among researchers and managers working on climate change R&D especially in Southeast Asia;
- enhance the skills and experience of participants in developing climate change-related R&D programs and projects; and
- identify appropriate location-specific mitigating and adaptation measures that will be considered for incorporation into the respective action plan of the LGUs.

The in-country short-term trainings aimed to provide participants with core climate science concepts for them to get a clearer understanding of climate change as well as its impact on agriculture, forestry, and fisheries. Among the expected outputs for this training is the climate change RDE Action Plan and research proposals on climate change adaptation and mitigation in agriculture.

Planned overseas educational visits aim to provide identified participants first-hand knowledge and information on how neighboring ASEAN countries develop and implement programs and activities addressing climate change. There would be an exchange of ideas and sharing of experiences, like comparing notes. The overseas educational visits are part of BAR's effort to explore and strengthen partnerships and collaboration between and among DA institutions and with other RDE institutions in other countries to work together in addressing common climate change issues.

Participants included researchers from RIARCs and RFRDCs, BSWM, BPI, BFAR, BAI, and BAR. There were also representatives from various SUCs, local government units (provincial and municipal). Representatives from member-agencies of the Los Baños Science Community (UPLB and PCARRD) also participated in the training.

By disseminating information on climate change issues and in educating the agricultural sector, BAR is assisting its partner-agencies in spreading the word about climate change and in crafting the appropriate responses to the farmers and other agricultural stakeholders that includes translating the different technologies and information in ways that farmers can understand.

In developing adaptation and mitigating strategies, there is a need to be equipped first with the right information/knowledge and the right tools on how to adapt to the changes in order to be appropriately guided in decision-making.

FORGING LINKAGES FOR INCREASED MARKET POTENTIALS

BAR strengthened its collaborative work with other government agencies in mainstreaming R&D-generated technologies alongside showcasing of commerciable products developed.

BAR, through its Technology Commercialization Unit, has gone beyond being merely a funding and coordinating agency. BAR was able to widen its horizon, establishing partnerships not only with R&D institutions but also with other entities such as the local government units including the provinces of Quezon, Oriental Mindoro, and Ilocos Norte, and private sector that leads to an established and strengthened public-private partnerships.

BAR strengthened its collaborative work with other government agencies like the DA-AMAS which collaborated in mainstreaming R&D-generated technologies alongside showcasing of commerciable technologies and products displayed in the R&D TechCom Center. This paved way the way to new market linkages and networks for a more unified agribusiness venture. Important personalities paid visits to BAR for different purposes.

Potential collaborations with R&D partner-agencies and LGUs

AMAS Director Leandro Gazmin visited the R&D TechCom Center of BAR to work on how to enhance and strengthen the market potentials of R&D-generated technologies funded by BAR, particularly innovative products that are not yet in the mainstream market but have the potential to grow as an industry. Dir. Gazmin showed interest and enthusiasm for BAR's endeavors on technology commercialization and enjoined BAR to work closely with AMAS, particularly on sharing information on existing and new technologies as well as databases of suppliers and producers. He also advised BAR to expand the linking of technology developers with various marketing arms and potential investors.

The visit of Rep. Irvin M. Alcala of the 2nd District of Quezon was followed by a PRA by BAR and BFAR in Sariaya, Quezon with the objective of helping the small fisherfolk in the area through establishment of new fisheries livelihood opportunities. PRA is the first step in the conduct of a CPAR project. A CPAR project titled, "CPAR on Crustaceans and High-Value Finfishes in Ponds and Cages" was implemented in Barangay Bignay 2 and Barangay Kiling as the project sites. This focused on mudcrab and grouper culture in fishponds. Grouper culture was replaced with oyster culture as it was found more feasible and has a higher market value.

Meanwhile, to develop and enhance Ilocos Norte's local products such as *bagnet, longaniza, basi, duhat, sukang iloko, malunggay* chips and fish specialties, BAR was tapped as one of the government agencies to help form a public-private agribusiness partnership. Seeing the wide-array of Philippine products displayed and marketed at the DA-Agribusiness Export Showroom (AES) during a visit to the department, Ilocos Norte Governor Imee R. Marcos requested for DA's assistance in helping the small and medium entrepreneurs bring their products to markets outside the province. She aimed to have these products included in the AES as well as other places where the *Pinoy Agri-Karts* are deployed. Other possible outlets being sought are the DTI's OTOP Showroom in Macapagal Avenue, and the DAR-Philfruits ARC Outlet.

Taking the lead to help Ilocos Norte entrepreneurs, PADCC conducted a series of meetings with the local government unit of Ilocos Norte and representatives from BAR and other government agencies.

KNOWLEDGE–LEARNING MARKET INITIATIVES: THE NEDA–PEP AND IFAD EXPERIENCE

BAR showcased products and technologies developed by its partners with funds from RP-Japan Grant Assistance for Underprivileged Farmers or GAUF.

BAR participated in the NEDA-PEP and IFAD two-day product exhibit and knowledge-learning market initiatives held at the SM Megamall Trade Hall 2, held on 12-13 October 2010. PEP is a financing window implemented by NEDA, utilizing 20 percent of its peso proceeds of the RP-Japan Grant Assistance for Underprivileged Farmers (GAUF) while the remaining 80 percent is administered by the DA, through NAFC. Meanwhile, IFAD is a specialized agency of the United Nations established in 1977 as an international financial institution.

BAR showcased five products developed by its partners with funds from the NAFC-BAR project "Technology Management for Competitive Agriculture and Fisheries Sector" during the NEDA-IFAD Exhibit. TCU and ACD staff, in cooperation with NBN's *Mag-Agri Tayo* crew, produced documentary reports of the five NAFC-BAR projects shown during the exhibit.

The five technologies developed from the NAFC-BAR projects were:

1. BPSU's Protective Cultivation Technology

The technology promotes the use of organic inputs to produce safe vegetables to ensure a ready supply of organically grown vegetables in the main market. The project benefitted not only the students of BPSU but also a number of farmers and the clienteles of the school. Trainings on organic fertilizers and organic vegetable production were conducted. Farmers appreciated the technology because it has improved their lifestyle and the economic well-being of their community.

2. RMTU's Promotion of Mango Wine and Dried Mango

The processing of mango by drying and turning Spence syrup into wine lessens postharvest losses, thus more income is derived by mango growers. RTMU conducted training activities in Zambales to farmers and their housewives in the municipality of San Narcisio which resulted a good turnout. The project was able to boost the production and enhance the quality of processed mango products. At present, 10 *kaings* or 220 kgs of fresh mangoes are being processed daily with a net production of 132 kgs of dried mango and about 400L of Spence syrup that will undergo processing to mango wine. The project not only offered livelihood opportunities but also provided foods that are readily available.

3. FIDA-Reg. 5's Abakayamanan Program

The program emphasized the active participation of abaca farmers as partners in adoption and further improvement of integrated farming systems to increase abaca farm productivity. The Gubat Abaca Growers Cooperative (GAGC) in Brgy. Bentuco, Gubat, Sorsogon and the Malilipot Abaca Planters Association (MAPA) in Brgy. San Roque, Malilipot, Albay are the two coop-beneficiaries of the project. The project sought to increase the productivity of abaca (Musa textiles) and improve the socio-economic condition of the small-scale abaca farmers through diversified and integrated abaca-based farming systems and value-adding activities. The project also assisted the two Coops in marketing their products from abaca. With the Abakayamanan project, production of abaca fibers in Sorsogon and Alabay increased.

4. WESMIARC's Locally Available Botanical Plants

The project was developed to increase the utilization of locally available botanical plants in the country. The study made use of *malunggay* leaves in combination with lemon grass, *kalamansi*, and *yacon* to prepare juice concentrate. Also, consumed were indigenous plants including Yerba Buena, miracle leaf, lagundi, gota kola, banaba, and malunggay for tea preparations. These indigenous raw materials were gathered from existing DA Research stations all over the country including those that grow in the region. Botanical plants used were scientifically proven to have medicinal and therapeutic properties. Researchers conducted seminars and trainings to farmers, their housewives, and out-of-school youth for information dissemination on botanical plants utilization and processing (juice and medicine).

5. BAPAMIN's Sweet Sorghum Products

The project aimed to provide livelihood opportunities to farmers through the promotion and commercialization of sweet sorghum-based food products from seed grains specifically for feed and flour, vinegar and syrup. For the past two years, about 25 hectares were planted with sweet sorghum in Ilocos Norte through the BAPAMIN Farmer's Cooperative. Led by Engineer Antonio S. Arcangel, BAPAMIN started utilizing a technology on processing local foods such as vinegar, juice, and syrup from sweet sorghum. The Bungon Seed Producers supply seeds to BAPAMIN. This has encouraged more farmers to plant sweet sorghum gaining a yield of 20 tons from 8 tons.

STRENGTHENING SUPPORT SERVICES IN R&D

In 2010, BAR inaugurated the Multi-Purpose R&D Center providing better service to its regional partners.

(Left) The Multi-purpose R&D Center located at the back of the RDMIC Building which serves as the cafeteria and dormitories for BAR staff and its visitors.
(Right) Facade of the one-year old R&D Tech Com Center which located at the lobby of the BAR Building.

Multi-Purpose R&D Center

BAR formally inaugurated and unveiled the Multipurpose R&D Center, a three-storey facility that includes a cafeteria and dormitories. The formal inauguration was held on 5 October 2010 through a simple ribbon-cutting ceremony attended by BAR Director Nicomedes P. Eleazar, Asst. Dir. Teodoro S. Solsoloy, and CLSU-FI Exec. Dir. Marcelo M. Roguel.

The facility serves as a 'stop-over' abode for partners, visitors from the DA regional offices and other stakeholders while conducting their researches and other RDE related activities in Manila.

R&D Tech Com Center

Inaugurated in August 2009, the R&D Tech Com Center showcases and disseminates R&D-generated technologies and breakthroughs supported by DA, through BAR's flagship programs: NTCP and CPAR. This facility also serves as a facility where business clients or interested individuals can link with the technology generators and concerned suppliers. The Center presents an array of products from food, liquor, wine, tea, coffee, concentrates, cosmetics, among others which were developed by researchers and scientists from RFUs, SUCs, RIARCs, RFRDCs, and private institutions.

In 2010, more than 600 individuals visited the center. This illustrates a remarkable leap from that of 2009 with more than 200 guests. Brochures and other publication requests, inquiries on planting procedures, pesticide management, and processing of the different commodities, the agency who developed the product and videos relating to agricultural research were the frequent purposes of the visitors in the Showroom.

BANNER PROGRAMS

CPAR Goes into an Overdrive

In 2010, the CPAR program of BAR established a new record of 176 projects coordinated, providing benefits to 8,794 farmers all over the country from the 89 CPAR projects and 7,046 beneficiaries in 2009.

The 176 CPAR projects were implemented in all 16 regions through the RIARCs as well as through LGUs. With funding support from BAR, the projects were conducted in close coordination with national and regional research implementing units, the academe, and members of the community as well as the LGUs.

Implemented in 452 CPAR sites/baranggays nationwide, the 176 CPAR projects were distributed among all DA-RFUs. Participating in CPAR-related activities are 4,636 farmer-cooperators of which 4,158 were adopters of the interventions and technologies in their own farms. Adopters are beneficiaries of CPAR grants who are those farmers that adopted the technology because they have seen and believed in their effectiveness.

Of the 176 CPAR projects coordinated and funded last year, 89 percent (157 projects) are on agriculture while 11 percent (19 projects) are on fisheries. The number of projects for agriculture at 157 is a big leap from the 91 projects in 2009.

An increasing trend for three-year implementation

From 2007 to 2010, the number of CPAR sites increased from 233 to 452 nationwide. More farmers and farming communities came to appreciate the technologies and interventions introduced in the CPAR projects as shown by the increasing number of farmer cooperators and adoptors.

CPAR projects are not only focused on transferring technologies to the farmers but also in capacitating and strengthening farmer organizations, associations, and cooperatives. Included in every CPAR project implemented are activities that capacitate them in the forms of trainings and workshops assisting their organizations on appropriate bookkeeping/record keeping and fund management schemes. Through the project, organizations that were just starting were also provided assistance on local government accreditation to include them in government loaning programs and other credit assistance. In 2010, CPAR capacitated a total of 191 farmer organizations.

These capacity-building activities were institutionalized by BAR as part of each CPAR project at the onset of each project, BAR provides technical assistance to project implementers and is consulted during the various stages of the project.

Meanwhile, BAR's regional partners: RIARCs and RFRDCs, LGUs —took the lead in the implementation of a number of CPAR projects. In 2010, 12 CPAR projects were already led by LGUs. The 73 completed CPAR projects have been successfully turned over from the DA-RIARCs to the LGUs.

For smooth implementation, CPAR projects are monitored to evaluate the implementation with specific emphasis on the strategies, process of implementation, and beneficial impact to the community. This serves as a mechanism for BAR in identifying lessons learned, strengths and weaknesses, and areas for improvement. From the 176 CPAR projects, BAR monitored 44 CPAR on-going projects. Successful CPAR projects were documented so that other farmers and concerned stakeholders could also adopt and implement.




CPAR on Organic Agriculture

BAR was tasked under Section 20 of the Organic Agriculture Act of 2010 or the Republic Act (RA) 10068 to lead and coordinate among executive agencies of the government to develop, enhance and support and consolidate activities for the formulation and implementation of unified and integrated organic agriculture RDE plans and programs.

Under this law, BAR is tasked to create and organize an Organic Agriculture RD&E Network composed of research and educational institutions, local government units (LGUs), non-governmental agencies, and recognized associations of interest groups such as organic fertilizer manufacturers and distributors, agricultural engineers, agriculturists, soil technologists, and farmers.

BAR's assigned work under RA 10068 is in harmony with its mandate and commitment to consolidate, strengthen, and develop the agriculture and fishery R&D system for the purpose of improving its effectiveness and efficiency.

The Organic Act of 2010 provides for the development and promotion of an organic agriculture in the country through a comprehensive program to be executed by the newly institutionalized National Organic Agricultural Board (NOAB), a policymaking body that provides direction and general guidelines for the implementation of the National Organic Agricultural Program (NOAP). The NOAB is attached to the Office of the Secretary of Agriculture as the Agriculture Secretary is its Chairman. The Secretary of Interior and Local Government will act as its vice chair.

Part of BAR's commitment as a focal RDE agency is to fund and support organic agriculture and organic agriculture-related RDE projects. One means is through CPAR.

BAR has long been an advocate of organic agriculture even before the Organic Agriculture Law was enacted. The concept of organic agriculture has long been incorporated in CPAR.

In 2010, BAR supported 13 CPAR projects with focus on organic agriculture implemented through its DA regional partners of these projects, 10 in Luzon (CAR, Regions 3, and 4), two in Visayas (Reg 8), and one in Mindanao (CARAGA).

The term organic, as defined under Section 3a, refers to the particular farming and processing systems, described in the standards and not in the classical chemical sense. The word organic is also synonymous in other languages to "biological" or "ecological". It, therefore, directly supports biodiversity conservation. Organic agriculture includes all agricultural systems that promote the ecologically sound, socially acceptable, economically viable and technically feasible production of food and fiber. It dramatically reduces external inputs as it excludes the use of chemical fertilizers, pesticides and pharmaceuticals.

Taking New Heights through NTCP

Over the years, BAR's programs put great emphasis on the key role of R&D in attaining the government's goal of a sustainable agriculture and fisheries sector and food self-sufficiency for all. Changes in administration have not altered the basics.

In the middle of the year, with a new administration in place, BAR strategically aligned its programs to new directives. More challenges and opportunities for the upliftment of the agriculture and fisheries sector were welcomed.

Borne out of DA Administrative Order No. 3 Series of 2006, the NTCP is one of the BAR's banner programs. It highlights R&D breakthroughs and mature technologies generated and developed by R&D institutions. It serves as a vital tool for the development of enterprises and the improvement of agriculture- and fisheries-related industries. The Technology Commercialization Unit, serving as the lead unit of BAR in this endeavor, focuses on technology transfer, promotion, adoption, utilization, and commercialization.

BAR, through the implementation of NTCP, has taken steps to ensure that technologies will be strategically placed and transferred to areas and communities that most need them. It has sought the transformation of agriculture and fisheries from resource-based to technology-based industries. BAR has adapted through the transformations and taken up bold steps into managing a reformed R&D system, hence, soaring high for products to be efficiently commercialized.

Technology sourcing

A total of thirteen projects were funded in 2010, of which six were approved under the AFMA, five under the NAFC-2KR-funding, and two under the HVCC Program.

Project monitoring and evaluation

TCU coordinators, together with commodity experts, provide timely and appropriate feedback for project improvement and coordination of the NTCP-funded projects. A local counterpart at the region supports the BAR coordinators for efficient M&E activities. M&E will be participatory in nature to encourage a variety of ideas generated for feedback exchange and sharing. Different experts were tapped to assist in the M&E process. Four terminal reviews of projects were also conducted.

BAR brings *Asha* peanut to Quezon farmers

Asha peanut (Arachis hypogaea), which is now a certified peanut variety and is being widely cultivated in Isabela (Region 2) and Sorsogon (Region 5), has now reached the province of Quezon in Region 4 through a project funded by BAR.

BAR and CVIARC distributed 15 sacks of Asha peanut seeds to 15 marginal farmers representing six municipalities of the second district of Quezon for trial cultivation in the province.

Each farmer-cooperator allotted an area of 1,000 square meters to plant their Asha. As cooperators of the project, farmers were provided a one-day hands-on training to technically equip them with the appropriate package of technologies (POT) on the production and management of Asha peanut. Ms. Rose Aquino of CVIARC, who is the lead person for promoting Asha peanut production in the Philippines, served as the resource person during the training. The training was attended by 15 farmer-beneficiaries and community organizers of the Earthkeepers.

As part of the repayment scheme of the project, each farmer-cooperator will have to give back two sacks of seeds after harvest to ensure seed multiplication so that other farmers can also avail of the POT and benefits of cultivating Asha peanut.

These seeds we will be able to help the marginal farmers in Quezon by providing them an alternative livelihood to improve their incomes. Hopefully, after Isabela, Sorsogon and now, Quezon Province.

The project on Asha peanut production is in line with DA's initiatives to promote agricultural crops and products that have potentials to improve farmers' incomes but are not yet in the mainstream market.

BAR–NAFC Partnership

The BAR-NAFC partnership aimed to speed up the transfer of mature technologies for farmers' and fishers use for increased productivity and income by commercializing these technologies, thus, transforming agriculture and fisheries into market-driven sectors.

Outside BAR's regular funds, the Bureau was able to source support from other funding institutions and projects. DA, through NAFC, has provided support from grant funds given by the Japanese Government, the Japan 2KR Program Grant for Underprivileged Farmers. This support is for a range of diverse projects that aim to demonstrate the adoption of appropriate technology for commercialization in an effort to provide beneficiaries with an avenue to increase their income, ensure food security, alleviate poverty, and contribute to the growth of the agriculture sector.

The BAR-NAFC partnership aimed to speed up the transfer of mature technologies for farmers' and fishers' use for increased productivity and income by commercializing these technologies, thus, transforming agriculture and fisheries into market-driven sectors. DA's intervention in this undertaking is a welcome and positive development in terms of the promoting high-impact agriculture and fisheries programs that would ultimately benefit the marginalized farmers and fisherfolk.

In 2008, NAFC-2KR supported 27 projects: 12 projects are under crops; 7 livestock/poultry; 3 on rubber, 2 on PBME and 1 project each classified under fishery, biofuel, and beekeeping. For 2010, five projects were added. These were:

Project Benefit Monitoring and Evaluation Projects in Luzon and Mindanao

The study aimed to provide an appraisal of the project impacts, particularly the increase in income of direct beneficiaries, how the projects have diversified the household income, and how the beneficiaries are maintaining their projects to maximize the initial benefits gained. The study team visited 15 projects and conducted personal interviews and focus group discussions with all the project proponents. The study presented the status of the various projects, its impacts and benefits to the proponents, beneficiaries and the community. Of the 15 projects, eight were categorized as research projects, while the remaining seven were for commercialization.

Performance Evaluation of Five Sweet Sorghum Cultivars as Grains and Stalks for Bioethanol Fuel

The project, implemented by WESVIARC, aimed to evaluate the adaptability and performance of the five different varieties of sweet sorghum, hence, develop appropriate production technologies including product and by-product utilization for commercialization for feed and fuel.

Development and Promotion of Locally available Botanical Plants

The project, implemented by WESMIARC, aimed to compile and document the present practices and usage of botanical plants as supplement and herbal medicine; encourage the extensive usage of locally available inexpensive botanical plants as supplement for illness prevention as cure for various diseases; and for advocacy to a return-to-the-basic and traditional method of treating and preventing illnesses. Tests were conducted for the chemical components, pH Value, microorganism contents, and the benefit and health values. Sensory evaluation was conducted in various educational institutions to determine the taste, aroma, flavor, color, appearance, after taste, and over-all acceptability.

Sweet Sorghum Processing and Marketing Toward Commercialization

The project aimed to provide livelihood opportunities to farmers through the promotion and commercialization of sweet sorghum-based food products produced from seed grains for feed and flour, vinegar and syrup. For the past two years, about 25 hectares were planted with sweet sorghum in Ilocos Norte. The Bungon Seed Producers supply seeds to BAPAMIN. This has encouraged more farmers to plant sweet sorghum gaining yield of 20 tons from 8 tons.

Promotion of Beekeeping in the Province of Sorsogon

The project, which just started toward the end of 2010, aimed to establish linkages between apiarists and the future market of the honeybees' by-products.

DA's intervention in this undertaking is a welcome and positive development in terms of the promoting high impact agriculture and fisheries programs that would ultimately benefit the marginalized farmers and fisherfolk.

BAR–HVCC Projects

The DA- HVCC projects addressed the priority concerns of the government on food security and in addressing poverty-related concerns. BAR, through TCU, conducted project technical reviews on selected and lined-up projects submitted to BAR for funding and technical assistance from the HVCC Program. Eleven projects were funded under this program.

PROJECT TITLE	PROPONENT	DURATION
1. Field-level Evaluation of Near Ambient-Temperature Storage Systems for Onion (*Allium cepa*)	PHILMECH	1 year
2. Development of Genetic Markers for Identification of Onion Varieties (*Allium cepa*)	UPLB-FI	1 year
3. Technology Utilization and Commercialization of Makapuno	PCA	2 years
4. Sustainable Cacao Program: Bio Intensive IPM and Farming Systems Approaches	COCOA PHIL	2 years
5. Commercialization of Hot Water Tank for Heat Treatment of High Value Agricultural Commodities	UPLB-FI	2 years
6. Technology Piloting and Evaluation of Promising Clones of Coffee in Different Environment in Northern Mindanao	DA-RFU 10/ NOMIARC	2 years
7. Development and Promotion of Coco-based Farming Systems in the Bicol and Quezon Province	DA-RFU 5	1 year
8. Support for the Adlai Research and Development Program	DA-RFU 2, 4A, 5, 10 SUCs, Masipag Inc.	2 years
9. Soybean Road Map	DA-RFUs	2 years
10. Identification, collection of indigenous fruits in Palawan	DA-Palawan	1 year
11. Sapinit *(Rubus rosifolios)* production (Phase II)	DA-QAES	2 years

TECHNOLOGY PROMOTION

BAR spearheads the agriculture and fisheries forum and exhibit to showcase viable and commerciable technologies developed by its partners in R&D hoping that the business sector will take this as great opportunity to "shop" for the best technologies to venture.

With the theme "Facing Global Challenges in Agriculture and Fisheries through Technology Commercialization," BAR led the conduct of the 6th Agriculture and Fisheries Technology Forum and Product Exhibition on 5-8 August 2010 at the Mega Trade Hall 2, SM Megamall, Mandaluyong City. The activity was spearheaded by TCU. The SM Megatrade Hall has been the site for the activity since 2008 because of its strategic location that attract visitors from all walks of life. The choice has made products and displays more accessible as the venue provides maximum exposure and a broad captive market.

The BAR annual event was attended by representatives from RIARCs and RFRDCs, DA attached agencies and staff bureaus, SUCs, private sector, cooperatives, and NGOs. The activity served as venue for the business sector and interested individuals to choose and shop for the best technologies to invest in and capitalize for commercial ventures. The activity aimed to strengthen the partnerships between and among research organizations and the private sector toward more progressive and sustainable agriculture and fishery industries.

There were 94 booths set-up inside the trade hall to exhibit various production and processing technologies developed by various institutions and other regional products in the country. Exhibit visitors averaged 1,500 per day. Aside from the exhibits and product displays, the four-day activity included a series of seminars and product demonstrations on various topics featuring practicable technologies developed with funding support from BAR through its NTCP.

National and Regional Coordination

BAR, providing the overall management and coordination of NTCP, keeps close coordination and maintains a good working relationship with other key players in the technology commercialization process.

In 2010, BAR monitored the following key NTCP projects with high potential for commercialization and market:

LPMPC's Products from Queen Pineapple

The project was envisioned to enhance successful export of Queen Pineapple products and by-products to the world market. The project was able to establish 10 has. of Queen Pineapple production areas that are directly financed by the project, and which adopted recommended POTs/GAP. Another 32 has. were established in partnership with the LBP, beneficiaries are cooperative's partner-members, to produce quality pineapple fruits. The production of handwoven and machine-decorticated fibers is among the livelihood programs of the LPMPC for its members, majority of which are farmers. To date, products have established market footholds in Korea and Hongkong. The coop has applied for Queen Pineapple GAP-farm's accreditation/certification. They were able to establish tie-ups with Share People and Peace & Equity Foundation organizations.

Sweet Sorghum Validation Trials in Negros Occidental

The project aimed to conduct pre-commercial plantation validation trials to showcase sweet sorghum's complementary potential to sugarcane as bioethanol feedstock. The project is crucial in providing viable support and options for those who will be involved in sweet sorghum planting, either as complementary or alternative to sugarcane as bioethanol feedstock. Activities incorporated in the project include on-site assessment visits to the participant's pre-selected plantation trial areas in Negros Occidental (San Carlos, La Carlota, Victorias, Murci, and Sagay City) to be conducted by BAR commissioned experts. These experts conducted training on planting and other cultural management of sweet sorghum and also provided continuous technical assistance and supervision on crop establishment in the selected areas. BAR provided the needed inputs including seeds and fertilizer.

Crafting Philippine Soybean Roadmap in the Philippines

The program included establishment of knowledge-based and farmer-friendly research facilities for soybean production and development in the strategic production area in the country and to establish the strong partnership with a private sector in processing and marketing of soy-based products in local and international markets.

International Coordination

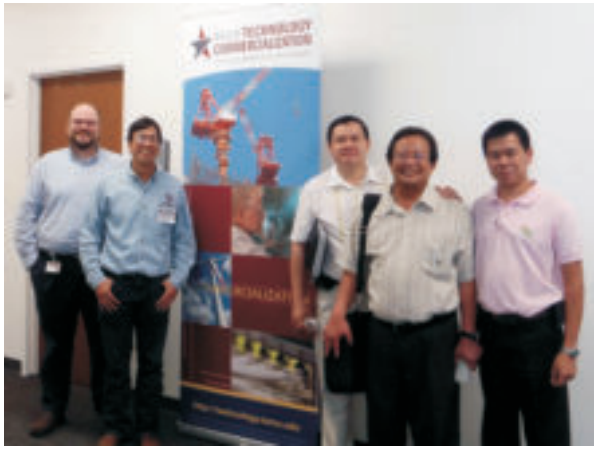
In 2010, BAR participated or conducted activities at the international level to augment its local earnings.

Capacity Building and Comparative Study on Technology Management in SouthEast Asia

The need for continuing capacity building in support of NTCP of BAR, particularly in the area of technology management, was addressed through the conduct of exposure/benchmarking visits to the following countries: Malaysia, Singapore, Korea, Thailand, and Vietnam. These study visits included roundtable discussions with different institutions that have hands-on experience on technology development and commercialization in the agriculture/agribusiness sector, and site/plant visits. It aimed to benchmark the BAR's TCU against relevant institutions in these countries in terms of 1) policy and institutional environment for technology transfer and commercialization; 2) value addition and value creation in agricultural products; 3) technology transfer and commercialization practices; 4) public-private sector linkages; 5) academe, NGOs, cooperative initiatives; and 6) local and international markets.

Study Tour on Coffee Germplasm Collection in Sao Paolo, Brazil

The coffee study tour was undertaken to explore possible areas of future collaboration with Instituto Agricola de Campinas (IAC) in the areas of coffee production and processing, and processing and exchange of genetic materials for coffee. This was participated in by representatives from the private sector (Philippine Coffee Board), SUCs namely: CaVSU, HVCC, and BAR. Based on the tour, one important aspect for R&D was genetic improvement to generate coffee cultivars resistant to pests and diseases (leaf miners and nematodes) and cultivars with naturally low levels of caffeine. Another important product of improvement of Coffea canephora generated the Apoata cultivar which is suitable for use as a rootstock, since it is resistant to nematodes and was found to be compatible with all Arabica coffee cultivars. The development of hybrids of Arabica and Robusta coffee called "Arabustas" is characterized by good yields, strength, and resistance to coffee leaf rust and cup quality superior to that of Robustas and may constitute an option for cultivation in warmer regions.



Conference and Study Visit to US Biofuel Research and Demonstration Facilities

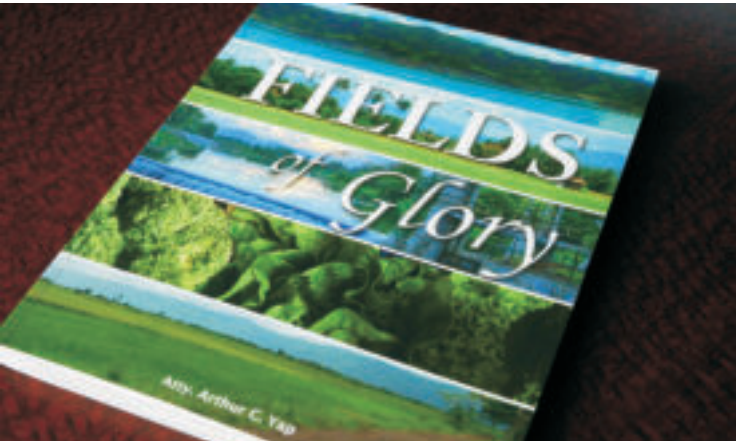
The study visit focused on the development and improvement of available lines of sweet sorghum. The study also looked into the availability of emerging biofuel feedstocks such as micro and macro algae, biomass, and other renewable energy sources. As an offshoot, the US Biofuel center shall provide hybrid varieties of sweet sorghum for optimum bio-ethanol production suitable to the local agro-climatic conditions.

Harmonization of PhilGAP with ASEAN GAP Conference and Workshop

This was participated in by representatives from the ASEAN member countries to harmonize our PhilGAP with the ASEAN GAP.

Book Launch of F.I.E.L.D.S.

BAR staff, in collaboration with other DA agencies, led in the preparation and launching of DA's coffee table book titled, "Fields of Glory," chronicling the major achievements of the Arroyo administration in its centerpiece agenda of food security and sufficiency, through its flagship project dubbed as FIELDS and other farm-related intervention programs.



FIELDS stands for the six areas of agriculture where President Arroyo has focused an unprecedented level of public spending - **F**ertilizer; **I**rrigation and other rural infrastructure; **E**xtension and education services for farmers; **L**oans; **D**ryers and other postharvest facilities; and Seeds and other genetic materials.

The book cites the accomplishments of the Arroyo administration under FIELDS and its various farm programs since Mrs. Arroyo assumed the presidency in 2001.

Various stakeholders of the agriculture sector cited the tangible benefits they have received from the Arroyo administration's vigorous implementation of its FIELDS program.

They include Ronelio Barsatan of the CBCP-NASSA-National Farm Center in General Natividad, Nueva Ecija, who pointed to the establishment of national and diocesan farm centers across the country that promote organic farming.

Ariel Dolores, a farmer from Guimba, Nueva Ecija, noted that he was able to pull down his production costs as a result of the government's FIELDS program. "We used to spend P40,000 per hectare to plant palay, but because of the irrigation provided under FIELDS, we were able to significantly reduce our costs especially since we no longer spend as much for fertilizer and other inputs. The soil we till has become rich with natural fertilizer from the clean water we get from irrigation."

Efraim Acacio of Sta. Ana Cagayan noted that the free technical assistance provided by the government - from selecting the right seeds to harvesting palay - helped him a lot in increasing his income. "I am proud to say that our dream will soon be fulfilled. We will soon complete the construction of a small concrete house for our family beside our farm."

Judy Aruta, who is a loan beneficiary of the Bukidnon Cooperative Bank, said that the easy-to-pay credit provided by government financial institutions to small farmers has been helping her carry out her plans of expanding her rice farm. "Because of FIELDS, we were able to provide for the needs of our family, send our children to school, and save for the future," he noted.

In Camarines Sur, Miller Bicaldo said the benefits of using the flatbed dryers provided by the DA have resulted in increased yields for farmers in the province.

source: Press Release from DA-Information Service

"The results of drying using flatbed dryers are strikingly different from the usual practice of highway drying. We were able to store more palay when we used flatbed dryers," he said.

Gelises Ladores of San Antonio, Nueva Ecija recalled how, during the rainy season in 2008, he was able to harvest 100 cavans of palay from his 1.5 hectare farm using submergence-tolerant rice seeds from the Philippine Rice Institute which were made available by the DA through the FIELDS program.

"I did not expect the Swarma-Sub1 submergence-tolerant seed variety to yield that much palay. My only wish at that time was to be able to harvest despite the strong rains," he said.

Other beneficiaries like livestock trader Cinco Placido Jr. and farmer Ramil Barte of Sariaya, Quezon lauded the benefits they received from the DA's initiatives on expanding market access for small farm stakeholders, while Bronzeoak Clean Energy President and CEO Jose Maria Zabaleta cited the positive impact of the DA's biofuels program on pioneering investors like him, and BT corn farmer Edwin Paraluman of South Cotabato noted the benefits of the DA's biotechnology program in increasing corn harvests.

For the Fertilizer component, the DA provided 1,380 technology packages on environment-friendly, community-based composting facilities under the Support System for the Tipid Abono Fertilization Program. Out of the 1,380 packages, 428 or 31 percent were distributed in the Mindanao Agribusiness Super Region, 315 in the North Luzon Agribusiness Quadrangle, 430 in Central Philippines, 204 in the Urban Luzon Beltway and 3 in the National Capital Region (NCR).

For Irrigation and other rural infrastructure, about P79.7 billion has been released for the restoration and rehabilitation of national and communal irrigation systems nationwide, making available 140,042 hectares of new areas. A total of 1,480,826 hectares located in the four super regions were also restored and rehabilitated.

The government also constructed since 2001 a total of 18,929 kilometers of farm-to-market roads worth P26.77 billion and established 50 mariculture parks covering a total of 49,073 hectares.

For Extension, the DA provided a total of 22,941 various agricultural technology trainings and orientations from 2001 to 2009 to 977,713 farmers, agricultural extension workers, and farmer entrepreneurs.

For the Loans component, from 2001 to 2009, a total of P28.8 billion was released under the government's Agro-Industry Modernization and Credit Financing Program and the Quedancor to farmer-beneficiaries. If palay production loans from the Land Bank and releases from other financial institutions and agencies are included, the total would amount to P465 billion.

For Dryers and other postharvest facilities, a total of 2,016 units of flatbed dryers were delivered, installed and completed. Through the mechanical drying system, an estimated 25,724 metric tons of palay valued at P437 million were saved in 2008. Moreover, a total of 39 cold chain facilities were completed and are currently operational nationwide.

For the Seeds component, the DA provided 1.68 million bags of hybrid and 12.5 million bags of certified palay seeds from 2001 to 2009 to farmers nationwide. The DA also established the development of climate-ready seeds including saline-, drought-, and flood-resistant varieties.

source: Press Release from DA-Information Service

PRIORITY PROGRAMS

Funding Upstream and Downstream R&D Projects

BAR focuses on supporting applied research, given its direct impact on the lives of the farmers and fisherfolk. However, it goes without saying that basic and strategic researches remain critical to the advance of technology and scientific information. Support given to the conduct of basic or upstream research is aimed at addressing emerging issues and concerns on R&D. An excellent example is BAR's support to basic researches on agricultural biotechnology covering both modern and traditional biotech.

Packaging of proposals for funding

In 2010, BAR, through its PDD, packaged and submitted three proposals to various local and foreign funding agencies:

- *Integrating the Conservation of Plant Genetic Resources for Food and Agriculture into Decentralized Landscape Management for Food Security and Biodiversity Conservation in Critical Eco-Regions of the Philippines* - submitted for a project development grant under the Benefit-sharing Fund of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). This Strategic Action Plan proposal for US$300,000 will be developed and implemented in collaboration with the United Nations Development Programme, as part of a broader strategic approach to sectoral adaptation, agro-biodiversity conservation, and decentralized capacity development being developed among various stakeholders in the Philippines.
- *CPAR Program on Rice-Based Farming System* for funding under the DA's National Program for Rice
- *Field Testing of ICRISAT Legume Varieties and Technologies in Selected Regions of the Philippines* (Phase 2)

Review and processing of fund release

Seventy-three R&D proposals which included 9 CPAR proposals from DA RFUs/BFAR ROs, 7 CPAR proposals from the LGUs, 3 PRA proposals, and 54 applied R&D proposals (see *Table 1*) were screened and reviewed. Out of the 73 proposals reviewed, 29 were recommended for funding.

Table 1. Proposals screened/reviewed for 2010

Agency	Applied	Basic	ADP	CPAR	PRA	Total
DA Regional Offices	13	0	0	9	3	**25**
Agriculture	*(11)*	*(0)*	*(0)*	*(6)*	*(2)*	***(19)***
Fisheries	*(2)*	*(0)*	*(0)*	*(3)*	*(1)*	***(6)***
LGUs	0	0	0	7	0	**7**
SUCs	29	0	0	0	0	**29**
Attached Units/ Bureaus/Agencies	9	0	0	0	0	**9**
Private Sector/Others	3	0	0	0	0	**3**
Total	**54**	**0**	**0**	**16**	**3**	**73**

Table 2. Continuing projects funded for 2010

Agency	Applied	Basic	ADP	CPAR	PRA	Total
DA Regional Offices	2	0	0	6	0	**8**
Agriculture	*(2)*	*(0)*	*(0)*	*(5)*	*(0)*	*(7)*
Fisheries	*(0)*	*(0)*	*(0)*	*(1)*	*(0)*	*(1)*
LGUs	0	0	0	0	0	**0**
SUCs	8	0	0	0	0	**8**
Attached Units/Bureaus/ Agencies	2	0	0	0	0	**2**
Private Sector/Others	3	0	0	0	0	**3**
Total	**15**	**0**	**0**	**6**	**0**	**21**

There were 49 projects funded in 2010 from which 15 were continuing projects on applied research, 14 new projects on applied research, 3 new basic researches, 10 new CPAR projects, 6 continuing CPAR projects, and 1 PRA (see *Tables 2 and 3*).

It is important to note that the applied R&D projects were the most funded projects in 2011 followed by the CPAR, which is one of the banner programs of BAR.

Table 3. New projects funded for 2010

Agency	Applied	Basic	ADP	CPAR	PRA	Total
DA Regional Offices	3	0	0	9	1	**13**
Agriculture	*(3)*	*0*	*(0)*	*(6)*	*(1)*	***(10)***
Fisheries	*(0)*	*0*	*(0)*	*(3)*	*(0)*	***(3)***
LGUs	0	0	0	1	0	**1**
SUCs	8	3	0	0	0	**11**
Attached Units/ Bureaus/Agencies	1	0	0	0	0	**1**
Private Sector/Others	2	0	0	0	0	**2**
Total	**14**	**3**	**0**	**10**	**1**	**28**

STRENGTHENING INSTITUTIONAL DEVELOPMENT PROGRAM

BAR, as the lead agency for agriculture and fisheries research, sees to it that continuous training for its management be pursued to enable to cope with the challenges brought about by recent developments in agricultural R&D

Boosting R&D manpower

For an organization to successfully attain its goals, it should have the human resources necessary to perform its task. In R&D and its rapid development, it is crucial that continuous training for its management be pursued to enable it to cope with the challenges brought about by recent developments in agricultural R&D.

Being at the forefront in R&D coordination in the country, the bureau recognizes the importance of building the capacity of the members of the DA R&D system. It acknowledges that human capital investment is the element that gives fluidity, flexibility, and functionality to an organization enabling it to adapt to changing needs and conditions of the population that it serves.

For the year 2010, three new scholarships for Masters and PhD Degree courses were awarded: two for the first semester and one for the second semester SY 2009-2010 (see *Table 4*). These are in the fields of environmental science, community development, and rural development.

Table 4. Scholars for Masters Degree Courses

Name	Agency/Institution	Course
First Semester SY 2010-2011		
1. Aries O. Ativo	CBSUA/UPLB	PhD Environmental Science
2. Lynlei Pintor	ERDB-DENR/UPLB	MS Community Development
Second Semester SY 2010-2011		
1. Albert Usman	DAF-ARMM/ USM	PhD Rural Development

Assistance was also provided to scholars in relation to their requests for renewal of contracts of service, scholarship extension, thesis/dissertation allowance, evaluation of thesis proposal, and liquidation of book allowance. For the Thesis/Dissertation Assistance Program, 16 applications were approved for assistance: SUCs - 12; DA - 4 (see *Table 5*).

Table 5. Thesis/Dissertation Assistance Program grantees for 2010

Grantees	Agency/ Institution	Course/School	Title of Research Study
Maria Asela B. Sebido	WPU	PhD Animal Science/ UPLB	Effects of Supplementing Diets with Different Levels of Garlic and Red Chili Powder on the Performance of Broilers and Layers and the Quality and Cholesterol Content of the Corresponding Products
Nilo S. Katada	DAF-ARMM	PhD Rural Development/USM	The Sustainability of Coastal Resource Management Program in the Province of Tawi-tawi
Donata L. Valler	DEBESMSCAT	PhD Crop Science/CLSU	Anthocyanin Production of Callus Cultures in Red Agati by Growth Factors
Tomas M. Astral, Jr.	NORMISIST	PhD Animal Science/VSU	In-Vitro Digestibility and Growth Performance of Goats with F1 Taiwanese Corn Fodder Supplemental with High Levels of Palm Kernel Meal
Elnor C. Roa	MSU-Naawan	PhD Chemistry/MSU	Quantitative Determination of Tropic Levels in Agusan Marsh, Northeastern Mindanao: A Method Development, Validation, and Application Study
Marife L. Pesino	CBSUA	PhD Agricultural Engineering/UPLB	Drying and Storage Characteristics of Golden Snail
Mary Ann B. Layug	PAC	PhD Animal Physiology/UPLB	Effect of Quantitative Feed Restriction on Growth and Physiologic Responses of Broiler Chicken

Table 5. *Continuation...*

Grantees	Agency/ Institution	Course/School	Title of Research Study
Maria Regina C. Cabanez	ASU	PhD Animal Science/VSU	Influence of Phytase in the Lactating Performance and Some Pathophysiological Profile of Sows Supplemented with *Trichantera gigantea* Leaf Meal
Leah S. Guzman	CSU	PhD Animal Science/CLSU	Survivability and Fertilizability of Bovine Oocytes After Vitrification
Rowena G. Kassem	DA RFU III	PhD Management-Development Communication/PAC	Stakeholders' Perspective on the Changing Development Trends in the Agricultural Extension Services of Pampanga, Philippines
Robert Dominick E. Mariano	UPLB	MS Economics/UPLB	Information Effects on the Outcomes of Repeated Experimental Cournot Oligopolies
Lucille T. Minguez	DA RFU-10	MS Plant Pathology/UPLB	Histological and Morphological Characterization of Cardaba and Cavendish Roots of Bananas Infected with *Ralstonia solanacearum*
Edelwina M. Blase	MSU	PhD Horticulture-Nutrition/UPLB	Controlling Acridity in Fresh and Processed Tannia Tubers
Jose Allan B. Dieta	URS	MS Aquaculture/CLSU	Growth Performance, Survival and Feed Conversion Ratio of Nile Tilapia Fed with Janitor Fish Meal
Rhona G. Dacillo	BAI	PhD Community Development/UPLB	Social Integration and Socio-Economic Gains of Farmers' Associations in the Cattle Dispersal Program in Dolores, Quezon, Philippines
Aimee Sheree A. Barrion	UPLB	PhD Food Science and Nutrition/UPLB	The Antimicrobial Efficacy of Pomelo Extracts on the Spoilage and Pathogenic Microorganisms of Raw Chicken Meat

For non-degree program, 75 grantees (53 foreign, 22 local) have been provided financial assistance for their attendance to trainings, seminars, and conferences. Expenses granted include airfare, registration fee, hotel, visa, and daily subsistence allowance.

Under the productivity enhancement program, seven applications were evaluated. Field evaluation, validations and documentation of research works for top two finalists were conducted in the selection of Outstanding Agricultural Scientist (OAS) under the DA-Annual Search for Achievers in Agriculture and Fisheries.

Also facilitated was the initial evaluation of two applications (1-NFRDI; 1-PCC) for scientist rank in the DOST Scientific Career System (SCS). The applications are now pending final evaluation by the DA-SCEC for endorsement of the Secretary to the DOST-SCS. An applicant in 2009, Dr. Dionisio G. Alvindia of PhilMech (formerly BPRE, was conferred the rank of Scientist 1 by the DOST – SCS in July 2010.

R&D Facilities Development

BAR supports the national, regional, and provincial RDE centers to strengthen institutional R&D capacity in the acquisition of scientific equipment, renovation and construction of research facilities, preparation of the master station development plan, and other critical needs of R&D centers.

A total of PhP29,367,010 for 19 projects were funded in 2010 (see *Table 6*). These projects were distributed among the DA-RIARCs, BFAR-RFRDCs, national and regional SUCs, LGUs, and private institutions in the agricultural and fishery sectors.

Table 6. BAR-funded projects on IDG for 2010

	RECIPIENT/ AGENCY	PROJECT	LOCATION
1	BFAR RFRDC CAR	Improvement of the R & D Facilities through Rehabilitation of Breeding	Liwan West, Rizal, Kalinga
2	CLSUFI	Improvement of the Research and Development Management Information Center Structure: Institution of Logistics Facility Service Area Phase 2	Muñoz, Nueva Ecija
3	CLSUFI	Improvement of the Research and Development Management Information Center Structure: Institution of Logistics Facility Service Area Phase 3	Muñoz, Nueva Ecija
4	CNSC	Establishment of Research and Development Technology Demonstration Center in CNSC	Labo, Camarines Norte
5	DA-CARIARC	Upgrading of DA-CARIARC Information and Communication Technologies (ICT) Facilities for an Edge in Agricultural Development	Trento, Agusan Del Sur
6	DA-CARIARC	Establishment of Agriculture Technology and Information Center	Trento, Agusan del Sur
7	DA-CEMIARC	Strengthening Research and Development Information and Products Communication Services in Region XII	
8	DA-CENVIARC	Upgrading of Mandaue Experiment Station	Mandaue, Cebu
9	DA-CENVIARC	Upgrading of Ubay Stock Farm	Ubay, Bohol
10	DA-CLIARC	Upgrading of Research and Development Facilities of DA-RFU 3s CLIARC ROS for Hillyland	Botolan, Zambales
11	DA-CLIARCLD	Development of the DA-CLIARCLD Facilities	Paraiso, Tarlac City
12	DA-CVIARC	Upgrading of the R & D Facilities of the DA-CVIARC's ROSes: Iguig Rice-based and Aglipay Cattle Centers	Iguig and Aglipay
13	DA-RFU4A-QAES	Establishment of Research and Development Convergence Center	Lagalag, Tiaong, Quezon
14	KAWIAGAN SA RANAO LIVELIHOOD TRAINING CENTER, INC.	Improvement of the Tissue Culture Laboratory at the Kawiagan sa Ranao Livelihood Training Center	Kawiagan, Lanao del Sur
15	MinSCAT	Institutional Development Support for the Upgrading of the MinSCAT Bongabong Campus Research Facilities	Bongabong, Mindoro
16	Nueva Ecija University of Science and Technology	Establishment of Information Center in Agriculture and Fishery at Nueva Ecija University of Science and Technology	Gen. Tinio St., Cabanatuan City
17	UPLB	Establishment of UPLB Agriville: A Showcase of Agricultural Systems Researches, Technologies and Products	Los Banos, Laguna
18	UPLBFI	Improvement of Research and Development Facilities for Breeding and Commercial Production of Ornamental Crops	Los Banos, Laguna
19	USM	Improvement of Biotechnology Unit of the USM	

National Research Symposium

The NRS is conducted annually by BAR to promote R&D excellence and to give due recognition to the accomplishments of agriculture and fisheries researchers for their notable achievements. The symposium also serves as a venue for disseminating new technologies and knowledge, useful to agriculture and fisheries modernization.

The 22nd NRS was held on 7-8 October 2010 at BAR with the theme, "Empowering Farmers and Fisherfolk in a Changing Environment: Improving Agriculture and Fisheries through R&D." Total entries were 70 R&D papers.

Twenty nine papers entered as qualifiers from the 70 entries. From the qualifiers, 18 were selected as finalists, which were presented to a panel of experts during the final evaluation.

The 15 winners were announced during the awarding ceremony held on 8 October 2010 at BSWM, Diliman, Quezon City. Agriculture Sec. Proceso J. Alcala, represented by Undersecretary Segfredo R. Serrano, served as the guest speaker at the awarding ceremony.

Winners of the AFMA Best R&D Paper

Basic Research Category

1st "MMSU hBE20: A Potential Village Level Enterprise for a Greener Philippines" by Shirley C. Agrupis of the Mariano Marcos State University

2nd "Population Composition and Genetics of Glass Eels in the Philippines" by Apolinario V. Yambot of the Central Luzon State University

3rd "Size-Structure and Gonado Morphometric Characterization of the Janitor Fish (Pterygoplichthys gill), 1858 from Marikina River, Philippines" by Joycelyn C. Jumawan of the Caraga State University

Applied Research TG/IG - Agriculture Category

1st "Screening of Alternative Approaches to Chemical Fungicide to Control Crown Rot-Causing Fungal Pathogens of Banana" by Dionisio G. Alvindia of the Philippine Center for Postharvest Development and Mechanization.

2nd "Improved Marang Postharvest Technologies" by Emma K. Sales of the University of Southern Mindanao

3rd "Etiology, Distribution and Management of Crown and Root Rot of Mango Trees at Bearing Age in Guimaras" by Maria T. Ecang of DA RFU VI-WESVIARC

Applied Research TA/TV - Agriculture Category

1st "Adaptation of Arrowroot (Maranta arundinacea) Processing Technologies in Typhoon Prone Marginal Areas in Bicol" by Arnulfo P. Malinis of the Bicol University

2nd "Mitigating the Effects of Climate Change through Rice Adaptation in Flood and Drought- Prone Areas in Bicol" by Corazon A. Orbon of DA RFU-V

3rd "Evaluation of Different Strains of Coffee Arabica in the Highlands" by Norma B. Pedroche of the BPI-Baguio National Crops Research and Development Center

Development - Agriculture Category

1st "Agribusiness Development Project on Lanzones in CALABARZON" by Avelita M. Rosales of DA RFU IVA- STIARC

2nd "Development of Fruit Crops Seed System in Eastern Visayas" by Carlos S. Dela Cruz of DA-RFU VIII-EVIARC

3rd "Nurturing Rural Community by Bringing in Technology to Aroman, Carmen, North Cotabato" by Erlene C. Manohar of the Philippine Coconut Authority

Socio-Economics Research Category

1st "Market Structure, Conduct and Performance of the Inbred Rice Seed Industry in Northwest Luzon" by Bethzaida M. Catudan of the Philippine Rice Research Institute-Batac Station

2nd "Supply Chain Improvement for the Abaca Fiber Industry in Selected Areas in the Philippines: Phase 1 Evaluation Research" by Antonio P. Abamo of the Visayas State University

3rd "Assessment of the State and Magnitude of Paddy Postharvest Losses in Major Rice Production Areas in Region 8" by Leonarda A. Londina of DA RFU VIII-EVIARC

AFMA Best R & D Poster Award

1st "Assessment of the State and Magnitude of Paddy Postharvest Losses in Major Rice Production Areas in Region 8" by Leonarda A. Londina, Glicerio N. Pernito, Elvira C. Torres, Rufino B. Ayaso III, Amelita R. Salvador, Domingo Miranda of the DA RFU VIII – EVIARC and Philippine Center for Postharvest Development and Mechanization

Enhancing Research Coordination

A key mechanism for better implementation of agriculture and fisheries R&D is through systematic and effective research coordination, an important goal to maximize research funding, provide collaboration, and prevent duplication.

BAR, through its RCD, monitors and evaluates the implementation of RDE activities under the national/regional RDE networks agenda and programs, and establishes and strengthens linkages collaboration among existing RDE systems to enhance sustained growth in agriculture and fisheries sector. It is also the task of RCD to assist in the identification and assessment of technology/information for adaptation, verification, commercialization, dissemination, and patenting as well as maintain and update the inventory of agriculture and fisheries projects. In 2010, RCD coordinated 270 on-going projects. These were implemented by R&D partners from SUCs (40), RFUs (208), NCAs (8), LGUs (12), and NGOs (2).

Agribusiness Demonstration Projects

One of the key programs that RCD is coordinating is the ADP which is being implemented by the DA research stations.

ADPs are income-generating or self-liquidating enterprises that are aimed at strengthening RIARCs strategy of "teaching by example"— demonstrating to the farmers the profitability of new/appropriate technologies that are suited to the conditions of the region and then transferring them to rural communities. BAR provides the "seed money" for the ADPs which are ploughed back to the project for sustainability, expansion, and support for the R&D activities of the RIARCs.

Stations with ADPs showcase modern technologies in agriculture which can be easily accessed by the farmers and other clients, thus, accelerating the transfer of these technologies from research stations to rural communities. Adopting ADP is like hitting two birds with one stone; stations are able to demonstrate GAP to farmers and at the same time generate income to support R&D activities of the RIARC.

One ADP is BOFPP, a support project/activity for the implementation of CPAR in all DA-RIARC stations. The project aims to produce organic fertilizers to CPAR farmer recipients.

BAR continuously coordinates the implementation of the 19 BOFPP projects being implemented in 16 DA-RIARCs. The implementing units including the farmer-beneficiaries and private entrepreneurs all over the country have already recognized the importance of the technology in increasing farmers' yield and income. The projects serve as additional source of income for the maintenance and other operation activities of stations.

BAR provides the "seed money" for the ADPs which are ploughed back to the project for sustainability, expansion, and support for the R&D activities of the RIARCs.

Site-Specific Nutrient Management

In 2010, the SSNM program released the software, Nutrient Expert for Hybrid Maize, a computer-based decision support tool that enables local experts to quickly formulate fertilizer guidelines for hybrid maize in favorable tropical environments. The software and its user's manual can also be downloaded for free through the IPNI website: *http://seap.ipni.net/articles/SEAP0059-EN.*

The SSNM Group, assisted by RCD, conducted the "Dry Season SSNM National Review and Planning Workshop" on 21-24 April 2010 at BAR, and the "Wet Season National Review and Planning Workshop and Training/Workshop on Nutrient Expert for Hybrid Maize Software and Development of Quick Guides for Fertilizing Hybrid Maize" on 16-19 November 2010 in Davao.

The quick guides were developed for at least one municipality in each region using results from the on-farm trials and/or outputs generated from the Nutrient Expert for Hybrid Maize software. Quick guide templates for Regions 2 and 6 were also developed to facilitate dissemination of the SSNM technology to corn farmers. These templates were pre-tested with farmers in the municipalities of Cauayan, Isabela and Cabatuan, Iloilo. Other quick guide templates for other regions were also developed during the nutrient expert training in Davao City. The SSNM was also able to draft a field operations manual that would help users in conducting SSNM trials in other corn areas.

Other accomplishments of the SSNM program included:

- Creation of a National Management Team by the Philippine Secretary for Agriculture to provide guidance and support on the technical aspects of SSNM
- Drafting of a technical manual on the development and participatory evaluation of SSNM for corn in tropical, favorable environments which can be downloaded from the IPNI web portal (*http://seap.ipni.net*).
- Identification and training of partners in the country who were involved in activities related to the development and participatory evaluation of SSNM recommendations.
- Upscaling of SSNM for corn in Brgy. Arubub, Jones, Isabela involving 30 hectares during the 2009-10 dry seasons.

National Rubber Research & Development Program

Natural rubber enjoys a lucrative market in the global rubber industry and is expected to see price increases in the next 20 years. Hence, global consumption for natural rubber may well reach 31.8 million tons by 2020. With this scenario, DA has given priority to rubber as a high-value commercial crop and therefore created NRDP. Specifically, BAR is tasked to lead the R&D component of the NRDP and give support to its extension activities. Through the program, DA is targeting to increase the current area planted to rubber from 120,000 ha to at least 300,000 ha, which consequently will increase production and exports value at $960 million in 2020.

Currently, the Philippines has 380,000 metric tons of natural rubber produced. Among the provinces identified as viable areas for rubber production are Sultan Kudarat, Isabela, Maguindanao, Benguet, Camarines Sur, Palawan, Antique, Negros Oriental, Negros Occidental, and Mindoro Occidental.

BAR is supporting the commercialization of the recommended rubber clones in the country, and other production and processing technologies through technology demonstration and promotion in suitable rubber areas nationwide.

In 2010, BAR provided funding assistance to the following rubber RDE projects:

- eight on-going CPAR and techno demo projects in Regions 9, 10, 11, 12, and 13;
- eight on-going NTCP on rubber located in Palawan; Pampanga/Tarlac; Mindoro; Southern Leyte; Rodriguez, Rizal; Bacnotan, La Union; Lucban, Quezon; and Siniloan, Laguna;
- three on-going upstream research projects on biotechnology, plant breeding, and pest/disease management on rubber implemented by researcher-professors from University of Southern Mindanao USM.
- one on-going database development project titled, “Developing Baseline Information System for the Philippine Rubber Industry,” implemented at USM

Other RDE Projects

RCD also monitors R&D projects being implemented by SUCs, staff bureaus, and attached agencies including DA regions. In 2010, RCD monitored 74 BAR-funded projects from which 152 project reports were reviewed. Also coordinated were 10 semi-annual reviews, in which 10 projects were reviewed and 31 were given terminal reviews.

Agriculture and Fisheries Policy Research

No journey to goal is unidirectional. There always are bends, curves, and changes en route—true, even to agricultural development.

To sustain the momentum and smoothness of the bureau's drive to agricultural growth, BAR, through its AFPRU, continues putting up guiding road signs through drafting adaptive policy and strategy recommendations for BAR management and DA to address changing agricultural trends. The unit is also responsible for coordinating with relevant institutions on the conduct of impact assessment, socio-economic and policy researches pertaining to agriculture and fisheries. Outputs are bases for public expenditure prioritization for agricultural research as well as in the modification of development program implementation processes. Moreover, the unit assists in ensuring effective coordination and complementation of all agricultural researches for maximum utility to the A&F sector.

AFPRU therefore continuously seeks means to strengthen and elasticize R&D buffer zones of adaptation to responsively deal with the fast-changing trends, emerging issues and concerns in the agriculture and fisheries sector.

Toward the 'greener side' of agriculture

Recognizing the emerging preference for chemical-free produce and expanding foreign market for safe food, AFPRU played a key role in the conduct of the project, "Gap Analysis on the R&D of Organic Agriculture: Focus on Organic Fertilizer." The unit encoded, organized, and formatted data collected on organic agriculture including literature on completed and on-going researches for Regions 2, 3, and 5. On 6 October 2010, in collaboration with other BAR technical units, the unit served as moderator and secretariat for the Conference Workshop under the said project.

Other policy-related initiatives

AFPRU prepared, drafted, and revised various pertinent documents which are indicated as follows:

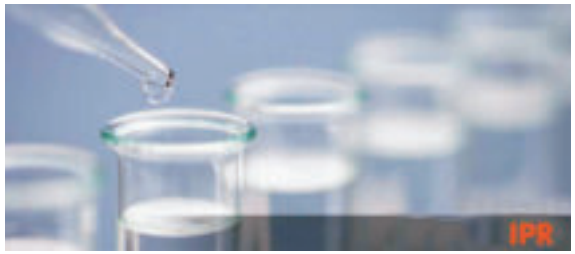
- Revision of necessary documents/procedures for scheduled ISO audit for upgrading of BAR from ISO 9001: 2000 to ISO 9001: 2008.
- Presentation materials for meeting with DOST in relation to the organizational development of BAR and the Magna Carta for scientists, engineers, researchers, and other S&T personnel
- Presentation materials for the scheduled 2010 Gawad Saka Review Workshop
- Revision of guidelines and procedures for the 2010 Gawad Saka

The unit also facilitated the release of balance of funds for the following BAR-funded projects:

- Productivity Growth in Philippine Agriculture
- 2008 National Nutrition Survey: Individual Food Consumption
- Integration and Packaging of Available Corn Statistics

PROTECTING R&D'S INTELLECTUAL PROPERTY

the BAR's IPRO persists on strengthening intellectual property management to draw attention on research-based innovations and ease the transfer of technology as well as enhance market access to R&D products and attract local and foreign investments.



It is good to note that not only the farmers but the innovators as well are stakeholders of agriculture and fisheries R&D. These innovators are key agricultural growth drivers that spend long hours in perfecting their endeavors, thus, creating quantum leaps in R&D through their discoveries, inventions, and innovations, which are adopted by the general public especially the farmers.

Hence, it is just but right for these creative individuals to enjoy the fruits of their toil by helping them secure legal protection for exclusive rights over their novel outputs.

Eyeing novel outputs for potential IPR

The IPRO in 2010 reviewed and evaluated four BAR-funded project documents that possess IPR potential for patentable inventions, technologies, processes, and products, namely:

1. Biotechnological production of high-value products from wastes of mango processing industry (with six studies) – BIOTECH-UPLB
    - Enzymatic extraction of essential oils from mango peel
    - Bioethanol production from mango peel
    - Extraction and characterization of phenolic antioxidant from mango seed/peel
    - Development of health drinks from mango peel
    - Utilization of mango kernel flour as bakery ingredient
    - Sensory, chemical , microbiological, and stability testing of biotechnologically produced food and non-food products from mango peel/seed
2. Organic vegetable production in Benguet – DA-CAR
3. EMP Feedmix Manufacturing – private company, Mindanao
4. Refinement of sea cucumber (*Holuthuria scabra*) culture techniques and assessment of co-culture systems for commercially important echinoderms – UP-MSI

Evaluations of the reports start from novelty spotting. After determining the IP potential from a research output or an invention, such is evaluated using the criteria for the IPR concerned. An IP may qualify as Utility Model (UM) while more advanced technologies are for Trademark applications.

Being of service to IP right holders

Acting as the prime mover in DA in protecting the researchers' exclusive rights to their cutting edge R&D outputs, BAR-IPRO staff served as representatives of IP applicants to the Intellectual Property Office of the Philippines (IPOPHL). The unit offers technical assistance to individuals and researchers not only on their applications but also on consultations on IP Policies and IP-related problems.

Since most of the applications for IPR are not finished in one-year span, IPRO in 2010 continued 20 transactions with the IPOPHL including 13 activities for compliance and coordination purposes. Direct assistance was also provided to seven IP right holders from various organizations such as PCA and private institutions.

Reaping the fruits of IPR

What's more important than the hardship of planting and growing a tree is the fruit itself. Indeed, 2010 was another fruitful year for BAR-IPRO and IP right holders as another UM and two Trademark applications assisted by the unit finished their examination and registration processes at the IPOPHL.

IPR Applications in 2010

Title	IPR	Filing Date	Registration Date
EKDA and Device[1]	Trademark	10 July 2009	10 December 2009
Local Vaccine against Newcastle Disease and Device[2]	Trademark	23 September 2008	10 December 2009
Acid Protease[3]	Utility Model	13 April 2009	9 April 2010

[1] *This is a brand and device for use in their products.*
[2] *The mark consists of local vaccine against Newcastle Disease of chicken.*
[3] *The Utility Model is on practical and innovative process of acid protease production by solid substrate fermentation in rice bran and coconut water using Rhizopus sp. The produced acid protease is used as an additive to feeds.*

Effective Management of Information and Knowledge

In 2010, the communication drivers of BAR shifted to high gear and stepped on the gas with ACD and IMU, taking to new routes in information generation and dissemination. Work speed with accuracy summarizes the year-long activities and accomplishments of ACD and IMU for 2010. Rapid and massive information campaign on CPAR and NTCP, the two banner programs of the bureau, took the mainstream in R&D information and communication delivery.

ICT as the modern tool for technology promotion

The advent of modern technology and the fast-paced computing environment drove many government offices and private institutions to be at par and re-invent their approaches to adapt to technological advancement.

BAR, through IMU, stood on its commitment to keep abreast with the latest development on information technology. And in order to provide the ICT needs of the entire bureau and its clientele, the unit made several innovations and development; for instance, IMU enhanced the technical capability of BAR personnel in the monitoring and coordination of banner programs using the Information-based Decision Support System; conducted training on the fundamentals of IT, Auditing, Information Security Management and IT Governance; and coordinated the operationalization of E-Pinoy FARMS® as the M&E system of CPAR.

Critical to the unit's day-to-day operation is its ability to keep the system ready and operational at any given time regardless of established portal and systems developed. Thus, a thorough maintenance and management program was instituted.

Among its components are the following:

- Maintain and manage the Computerized Information System (CIS).
- Maintain the 17 information systems being operated and utilized by the different technical divisions and units including the support service units like accounting and budget, records, and supply sections.
- Monitor the 24/7 operation scheme including 140 workstations and users.
- Maintain the 12 servers for smooth operation.
- Assess the BAR Local Area Network (LAN) with UPLB-ITC.
- Supervise the bureau's telephone system (direct and local) lines through the PABX.

IMU did not step on the brakes in 2010 but instead steered into the direction of upgrading the communication facility of the bureau. On the same year, the unit contracted out a new Payroll System, Personnel Information System, and the Daily Time Record which shall be tested in 2011. Such a move is necessary to obtain accuracy in administrative reporting and other matters. IMU is debugging the development of software on Project and Proposal Monitoring System for deployment on the first quarter of 2011.

The unit managed the operation of the BAR-SAIL as a learning laboratory for geospatial information technology for BAR and its partners. In the process, it generated 126 “shape files” for four agencies: DA Region 7, Tokyo Institute of Technology, DA Convergence Initiative, UP Diliman. The unit also generated crop suitability maps for eight commodities, namely: avocado, cotton, durian, guava, mangosteen, palm oil, papaya, and yam. The unit has also been commissioned to lead specific ICT Projects like the e-Pinoy FARMS for Fisheries, and among the specific functions provided in this area include the following:

- Coordinate the conduct of orientation and profiling guide, system updating, and report deployment to all regions.
- Coordinate the preparation of workshop on Operationalization of e-Pinoy FARMS as M&E of CPAR Programs.
- Conduct users' training of the system.
- Deploy ICT equipment for the conduct of the project.

Web maintenance and operation are considered the heart and soul of IMU and thus, regular updating and troubleshooting served as their shield against the flaming arrows of viruses and unwanted source files.

IMU in 2010 also implemented the AFRDIS Phase IV Project and the Geophysical Information System (GIS) titled, “Strengthening the Utilization and Application of Geospatial Technology on High Value Commercial Crops.”

Fast and accurate delivery of beneficial information guided the entire unit in their effort to promote reliable information.

KNOWLEDGE IS POWER

Being in a position to prepare, process, package, and disseminate relevant R&D results to the public, BAR considers information and knowledge as the most powerful tool useful in the various processes of change. It is not only about communicating research results wherein "success stories" in the farming and fishing fields are highlighted, more than ever, it now sees itself as a powerful catalyst for change, and an influential agent to spur a transformation.

An estimated 5,000 copies each of BAR, CPAR, and NTCP Institutional Primers went to all directions during the holding of national and regional exhibits initiated by the Bureau. On top of this, roughly 5,500 technology guides and brochures on Ubi Production, Fruit Wines, Oregano Wine and Juice Making, Sweet Sorghum and Value Added Products from Tilapia among others were also distributed.

The Publication Section of ACD produced two issues of BAR Digest and 12 editions of BAR Chronicle. These publications highlight the latest news and trends on R&D. The section also published the 2009 Annual Report and the 2009 R&D Highlights.

The Division placed premium on corporate imaging and thus was responsible for media exposure both in print and broadcast medium. Approximately 280 news articles on research and development as well as photo releases were prepared and published in the BAR Website. On top of this, BAR has also been providing the DA Media Bureau with significant and current news on R&D for their press releases. Preparations of souvenir programs and other promotional advertisements for agriculture- and fishery- related programs and events were also prepared and coordinated with various stakeholders and clientele. Back home, ACD also provided technical and operational support on the conduct of A&F National Technology Forum, National Research Symposium, BAR Anniversary, Agrilink-Aqualink-Foodlink, DA-NEDA KR2 Exhibit, and DA's Gawad Saka, among others.

To keep the speed at maximum level in terms of media liaisoning, ACD also collaborated



with *Mag-Agri Tayo*, a regular agribusiness show being aired over NBN Channel 4, on the documentation of BAR-funded projects. The idea of project documentation is to highlight the success and impact of such to farmer-beneficiaries and to the communities as well. ACD and *Mag-Agri Tayo* worked together and documented 43 projects in 2010.

Within the year, BAR, through ACD, participated in nine exhibits and symposia held in the Metro Manila and nearby provinces. A huge volume of roughly 32,000 IEC materials were generated and distributed during the events.

The division sponsored four proposals for publications in the form of books, pamphlets, and briefing materials under the Scientific Publication Grant (SPG) and funded 12 proposals for the conduct of seminars, conferences, and workshops.

Sponsorships and advertisements at the international, national, and regional levels were also accorded preferential attention. Moreover, ACD prepared and packaged 16 talking points, speeches, and briefing materials for the director, assistant director, DA secretary, and other DA officials.

The Educational and Communication Section (ECS), on the other hand, facilitated and coordinated the conduct of 41 seminars as part of the in-house seminar series on relevant topics on the thrusts and direction of Philippine Agriculture. These seminars were given monthly for free and were delivered by technical experts in their chosen fields of expertise as resource speakers/persons. Regular attendees to this seminar series include the whole DA family, SUCs, selected industries from the private sector and the general public as well.

The Scientific Literature Services (SLS) is considered a one-stop-shop for vital and essential information to those seeking the latest development on national issues pertaining to the trends and dynamics of Philippine Agriculture. In order to remain updated and responsive to the needs of the public and the bureaucracy, the service encoded 594 library information and knowledge collections in the OPAC database for better efficiency and management of documents. The facility also coded and filed 1,489 agriculture- and fisheries- related news clippings for data storage, processing, and interpretation. These were further scanned and stored in CD format for easier file retrieval and storage. One of the major interventions of SLS in terms of coordination was their involvement with PhilAgriNet concerning information and knowledge products.

ANNEX

BAR as an Institution

BAR is one of the staff bureaus of the DA which was established to lead and coordinate the national agriculture and fisheries R&D in the country. BAR is committed to consolidate, strengthen, and develop the agriculture and fisheries R&D system for the purpose of improving 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.

Mandate
Executive Order 116, under the 1986 Freedom Constitution, created the Bureau of Agricultural Research with the mandate:

…to ensure that all agricultural research is coordinated and undertaken for maximum utility to agriculture. It shall tap farmers, farmer organizations, and research institutions, especially the State Colleges and Universities, in the conduct of research for the use of the Ministry and its clientele, particularly the farmers/fishermen and other rural workers.

Republic Act 8435 (AFMA) and Executive Orders 127 & 338

F*urther expanded and strengthened the mandate of BAR by providing leadership in enhancing, consolidating and unifying the national and regional agriculture and fisheries research and development programs of the National Research and Development System in Agriculture and Fisheries (NaRDSAF).*

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

R&D Thematic Thrusts
To realize BAR's vision, its banner programs are focussed on the AFMA thrusts:

- Food Security
- Increased Productivity and Profitability
- Poverty Eradication and People Empowerment
- Sustainable Agricultural Development
- Global Competitiveness

Strategic Approaches
The national agriculture and fisheries R&D framework will be implemented using the following approaches:

- Relevant and innovative technology and information generation
- Community-based technology development and validation
- Responsive technology commercialization
- Agribusiness development
- Public-private partnership
- Institutional development
- Local and international linkages
- Information communication technology management
- Knowledge management
- Provision of favorable research policy environment

Major R&D Programs

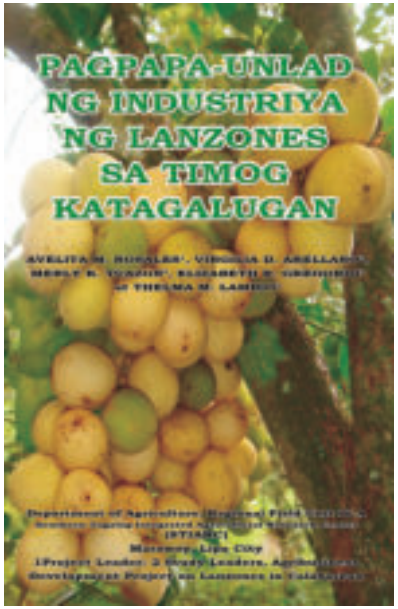
- Community-based Participatory Action Research Program
- National Technology Commercialization Program
- Organic agriculture Program
- Climate Change Program
- Biotechnology program
- Indigenous plants for health and wellness
- Basic and Strategic Research
- Human Resource Development Program
- R&D Facilities Development Program
- Knowledge Products and Services Program
- Information Communication and Technology Program
- Agriculture and Fisheries Research Policy & Advocacy

Eleazar receives CSSP's William D. Dar Award in Research Management

BAR Nicomedes P. Eleazar was conferred the 2010 William D. Dar Award in Research Management in recognition of his excellent management of the leading agricultural research institution in the country, BAR, making it much more equipped and capable in serving the country's crop science research needs efficiently, for six years. The award was conferred by the Crop Science Society of the Philippines (CSSP) during its 40th Scientific Conference and Anniversary held on 18 March 2010 at the Grand Regal Hotel, Davao City. The society cited Dr. Eleazar for providing leadership in the formulation of the overall R&D agenda in agriculture and fisheries, development of the R&D Strategic Plan and its translation into annual operational targets. These have been a potent instrument in transforming the Philippine agriculture. CSSP is a non-stock, non-profit corporation organized to promote basic and applied researches on crops and related sciences, foster high-quality education in crop science, and intensify dissemination and exchange of knowledge in crop science and crop production.

BAR bags three trophies from PAJ's Binhi Awards

BAR received three awards from the Philippine Agricultural Journalists, Inc. (PAJ) during its Annual Binhi Awards held at BSWM Building, Visayas Ave., Diliman, Quezon City on 16 April 2010. BAR Chronicle, the bureau's official monthly publication, won the Agricultural Newsletter of the Year Award for the second time while BAR Chronicle Managing Editor Rita T. dela Cruz was hailed Agricultural Photojournalist of the Year (second time) and 2nd placer Agricultural Journalist of the Year. BAR Dir. Nicomedes P. Eleazar and Asst. Dir. Teodoro S. Solsoloy led the ACD staff in receiving the awards. PAJ, an organization of agriculture and environment editors, reporters, and correspondents, information officers of government and private agriculture agencies, and industry associations, has been conducting the Binhi Awards since 1976.



STIARC paper on lanzones production wins 3rd PHILARM Best R&D Paper

The paper titled, "Research Management Strategies in Enhancing Productivity and Profitability of Lanzones Farms in Laguna and Batangas" by Avelita Rosales of the DA-STIARC won third place in the "Search for William C. Medrano Best R&D Management Paper" given during the 20th National Convention of the Philippine Association of Research Managers (PHILARM) held on 6-9 April 2010 at Aklan State University, Banga, Aklan. The paper is a result of two recently completed BAR-funded projects, namely: 1) Community-based Participatory Action Research (CPAR) on Rehabilitation of Lanzones in Brgy. San Roque, Alaminos, Laguna; and 2) Agribusiness Development Project (ADP) on Lanzones in Calabarzon. These projects highlighted research management strategies to enhance production and profit in lanzones production. Aside from Rosales, the team was composed of other researchers from STIARC, namely: Digna P. Narvacan, Thelma M. Lambio, Virgilia D. Arellano, Merly K. Tuazon, and Elizabeth R. Gregorio, and Cristina D. Goma of the Office of the Provincial Agriculturist (OPA) of Laguna.

BAR, STIARC project on tamarind wins in 18th Annual Fruit Symposium

The project, "Enhancement of Tamarind Industry in Lobo Batangas" implemented by STIARC and funded by BAR through its NTCP, won third place during the recently concluded 18th Annual Fruit Symposium held in Tagbiliaran City, Bohol. It was chosen out of the 31 papers presented for the Development Category with project proponents: Virgilia Arellano, Rosemarie Olfato, and Merly Tuazon presenting the paper. The proponents collaborated with the Big A Multipurpose Cooperative in Biga, Lobo, Batangas for the project. Through the project, the existing products of the Big A Cooperative, which consists of tamarind wine, tamarind balls, and sweetened tamarind, were enhanced. Aside from winning in the award in the symposium, the tamarind wine was awarded the "Best Beverage" (wine category) during the 8th Agraryo Trade Fair in 2009, while the tamarind balls was awarded "Best Processed Food" (sweet/delicacy category) in the 9th Agraryo Trade Fair in 2010.

ABBREVIATIONS

A&F	Agriculture and Fisheries
ACIAR	Australian Centre for International Agricultural Research
ACD	Applied Communication Division
ADB	Asian Development Bank
ADP	Agribusiness Development Project
AFMA	Agriculture and Fisheries Modernization Act
AFPRU	Agriculture and Fisheries Policy Research Unit
AFRDIS	Agriculture and Fisheries Research and Development Information System
AFPRU	Agriculture and Fisheries Policy Research Unit
AMAS	Agribusiness and Marketing Assistance Service
ASEAN	Association of Southeast Asian Nation
ATI	Agricultural Training Institute
AVRDC	The World Vegetable Center
BCP	Biotechnology Coalition of the Philippines
BAI	Bureau of Animal Industry
BAPAMIN	Batac, Pangasinan, and Mindanao Farmer's Cooperative
BAR	Bureau of Agricultural Research
BAR-SAIL	BAR-Spatial Analysis and Information Laboratory
BIARC	Bicol Integrated Agricultural Research Center
BFAR	Bureau of Fisheries and Aquatic Resources
BOFPP	Bio-Organic Fertilizer Production Project
BPhRE	Bureau of Postharvest Research and Extension
BPSU	Bataan Peninsula State University
BSWM	Bureau of Soils and Water Management
CAR	Cordillera Administrative Region
CARIARC	CAR Integrated Agricultural Research Center
CaVSU	Cavite State University
CBSUA	Central Bicol State University of Agriculture
CEMIARC	Central Mindanao Integrated Agricultural Research Center
CENVIARC	Central Visayas Integrated Agricultural Research Center
CGIARC	Consultative Group on International Agricultural Research
CHIPI	Chamber of Herbal Industries of the Philippines
CLIARC	Central Luzon Integrated Agricultural Research Center

ABBREVIATIONS

CLSU	Central Luzon State University
CLSU-FI	CLSU-Foundation Inc.
CMU	Central Mindanao University
CNSC	Camarines Norte State College
COCOA PHIL	Cocoa Foundation of the Philippines
COGENT	Coconut Genetic Resources Network
CPAR	Community-based Participatory Action Research
CRGM	Competitive Research Grant Manual
CSO	Civil Society Organizations
CSSP	Crop Science Society of the Philippines
CVIARC	Cagayan Valley Integrated Agricultural Research Center
DA	Department of Agriculture
DENR	Department of Environment Natural Resources
DFIMP	Diversified Farm Income Market Development Project
DILG	Department of Internal Local Government
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
DTRS	Document Recording and Tracking System
EDTRS	Employee's Daily Time Recording System
EO	Executive Order
e-Pinoy FARMS	Electronic- Pinoy Farm Resource Management System
FIDA	Fiber Industry Development Authority
FIELDS	Fertilizers, Irrigation, Extension, Loans, Dryers, and Seeds
GAP	Good Agricultural Practices
GAUF	Grant Assistance for Underprivileged Farmers
GEF	Global Environment Facility
GIS	Geographic Information System
GMA	Ginintuang Masaganang Ani
HIP	High Impact Projects
HRDP	Human Resource Development Program
HVCC	High-value Commercial Crops
ICRISAT	International Crops Research Institute for the Semi-arid Tropics
ICT	Information and Communication Technology

IDG	Institutional Development Grant
IEC	Information Education and Communication
IFAD	International Fund for Agricultural Development
IHRMIS	Infrastructure and Human Resource Monitoring Information System
IMU	Information Management Unit
INIBAP	International Network for the Improvement of Banana and Plantain
IP	Intellectual Property
IPNI	International Plant Nutrition Institute
IPO	Intellectual Property Office
IPRO	Intellectual Property Rights 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
KR2	Kennedy Reddy Round 2
LAN	Local Area Network
LBP	Land Bank of the Philippines
LDC	Livestock Development Council
LGU	Local Government Unit
LPMPC	Labo Progressive Multi-Purpose Cooperative
LSU	Leyte State University
MinSCAT	Mindoro State College of Agriculture and Technology
MMSU	Mariano Marcos State University
MSU	Mindanao State University
MOA	Memorandum of Agreement
MSI	Marine Science Institute
MSU-IIT	Mindanao State University-Iligan Institute of Technology
MTA	Material Transfer Agreement
M&E	Monitoring and Evaluation
NAFC	National Agricultural and Fisheries Council
NaRDSAF	National Research and Development System for Agriculture and

ABBREVIATIONS

	Fisheries
NAST	National Academy of Science and Technology
NBN	National Broadcasting Network
NCT	National Cooperative Test
NFRDI	National Fisheries Research and Development Institute
NNC	National Nutrition Council
NEDA-PEP	National Economic Development Authority-Productivity Enhancement Program
NGO	Non Government Organization
NOMIARC	Northern Mindanao Integrated Agricultural Research Center
NRC	National Research Centers
NRDP	National Rubber Development Program
NRS	National Research Symposium
NTCP	National Technology Commercialization Program
OAS	Outstanding Agricultural Scientist
OFR	On-Farm Researchers
OPAC	Online Public Access Catalog
OTOP	One Town One Product
PAC	Pampanga Agricultural College
PADCC	Philippine Agricultural Development and Commercial Corporation
PCA	Philippine Coconut Authority
PCAMRD	Philippine Council for Aquatic and Marine Research and Development
PCARRD	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development
PCC	Philippine Carabao Center
PDD	Programs Development Division
PHILAGRINET	Philippine Agricultural Information Services Network
PHILMECH	Philippine Center for Post harvest Development and Mechanization
PLGUs	Provincial Local Government Units
PIM	Pre-implementation Meeting
POT	Package of Technology
PRA	Participatory Rural Appraisal
PO	Private Organization
PTMIS	Proposal Tracking Monitoring Information System
QAES	Quezon Agricultural Experiment Station

R&D	Research and Development
RCD	Research Coordination Division
RDE	Research and Development Extension
RDEAP	Research and Development and 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 Center
RMTU	Ramon Magsaysay Technological University
ROS	Research Outreach Station
RRDEN	Regional Research and Development Network
SEAFDEC	Southeast Asian Fisheries Development Center
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SEMS	Scholarship Evaluation and Monitoring System
SLSU	Southern Luzon State University
SNAP	Simple Nutrient Addition Program
SPG	Special Publication Grants
SPPEMS	Supplies, Property, Plant and Equipment Monitoring System
SSNM	Site Specific Nutrient Management
STIARC	Southern Tagalog Integrated Agricultural Research Center
SUC	State Universities and Colleges
TCU	Technology Commercialization Unit
Tech Com	Technology Commercialization
UNDP	United Nations Development Programme
UPD	University of the Philippines Diliman
UPLB	University of the Philippines Los Baños
UPLB-BIOTECH	UPLB-National Institute of Molecular Biology and Biotechnology
UPLB-FI	UPLB-Foundation, Inc.
UPV	University of the Philippines Visayas
USM	University of Southern Mindanao
VDTMS	Vehicle Dispatching and Trip Monitoring System
VSU	Visayas State University
WESMIARC	Western Mindanao Integrated Agricultural Research Center
ZRCAF	Zonal Research Centers for Agriculture and Fisheries

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