

on-going publications; news and features; agri-fisheries video presentations, and other BAR-related activities capsulated in the form of photo releases.

The website is also host of the agency's two major banner programs: the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP).

Since BAR is the central coordinating agency for R&D, special portals of the website like the AgFishTech, PhilAgriNet, and the BAR Library Online Public Access Catalogue (OPAC) are currently maintained and updated.

The AgFishTech is a web-based knowledge portal which contains relevant information on the publication of DA's flagship commodities including crops, livestock, poultry, and fisheries. This virtual one-stop-shop is intended to benefit farmers, fisherfolk, stakeholders or individuals who are interested to go into agribusiness.

The PhilAgriNet, on the other hand, is an offshoot of the FAO-supported training workshop to bridge the gap between researchers and Philippine agricultural research literature. It aims to create a central electronic database of literature of agricultural researches conducted in the Philippines and to link these to agricultural researchers/scientist worldwide. Today, PhilAgriNet has established strong collaboration between public and private institutions engaged in agricultural

and fishery researches. The site is hosted by the bureau in partnership with the University of the Philippines Los Baños (UPLB).

Historical feat

As of March 2013, the BAR website obtained 195,289 page views (*users who visited the site more than ones*), while unique visitors (*users who visited the site only once*) were recorded at 66,218. Moreover, compared to the 2011 and 2012 statistics on the actual visits and new visits, the agency accomplished a 22.8 percent and 18.7 percent increase, respectively.

Based on BAR's 2012 Accomplishment Report, the total number of web pages developed for CPAR and NTCP alone reached 62 and 94 pages, respectively. The bureau also uploaded 53 news and features, and uploaded 1,708 photo releases.

BAR is currently maintaining 134 computers and has provided 183 IT support to all employees and other stakeholders during meetings and presentations made. The hardware and software components of all IT-related functions of the bureau is being managed and maintained by the

Information and Management Unit (IMU).

The advent of modern technology is a positive development and will continue to be if we all contribute to its progress. ###



Some of the "old faces" of the BAR website



First GAP certified mango farm in Zambales made possible through BAR

Good agricultural practices (GAP) encompass three major aspects in farming: quality of harvest, health of farmers, and sustainability of the environment.

In Zambales, a mango-producing province in Luzon, one mango farm has recently received GAP certification from the Bureau of Agriculture and Fisheries Products Standards (BAFPS) through the project titled "Establishment and Promotion of Good Agricultural Practices (GAP) for Mango in Major Production Areas in Luzon." Implemented by the Ilocos Integrated Agricultural Research Center (ILIARC) and the Central Luzon Integrated Agricultural Research Center (CLIARC), the project was conducted from 2009 to 2012 with support from the Bureau of Agricultural Research (BAR). The project is led by Dr. Orlino Mercado, CLIARC manager and Mr. Angel Tulabut, senior agriculturist.

Duly approved by Agriculture Secretary Honorable Proceso J. Alcala, it is the first mango farm in the Philippines to be certified as GAP compliant.

The project site is located in Iba, Zambales, specifically in the mango farm owned by Mr. Athene Abad. Since the receipt of GAP certification, Mr. Abad's farm has been gaining popularity among neighboring mango farmers and most importantly among consumers. "*Hindi na ako nahahirapan humanap ng market. Sila na ang pumupunta dito tuwing may harvest,*" (Looking for a market is not difficult for us. They go to our farm whenever we have harvest) he said in an interview during a project documentation conducted by staff from the Applied Communications Division and crew from PTV 4's Mag-Agri Tayo on 12-13 March 2013.



(inset photos) Mr. Angel Tulabut from CLIARC (left) and Mr. Athene Abad (right), owner of the mango farm in Zambales, relay the role of good agricultural practices in improving mango quality and productivity.

PHOTOS: NDELROSARIO & LPADILLA

The Code of GAP, which was formulated by the DA and approved under Administrative Order No. 25 series of 2005, covers production, harvest, and postharvest stages.

On 11-14 October 2011, GAP national inspectors visited the Abad Farm and required the following enhancements: fencing of area, tree labeling, acquirement of first aid box and fire extinguisher, maintenance of farm sanitation, and establishment of separate enclosed areas for chemicals and farm equipment.

Fertilizers and other chemicals were advised to be applied based on recommended rates and intervals. Fruit bagging during the early stage of mango fruits was also required to avoid physical damages caused by insect pests. Mr. Angel Tulabut also stressed the importance of proper disposal areas and

contaminant-free water source in adhering to GAP principles.

"The yield increased by 20 percent during the first cropping year with GAP adoption, and by 36 percent on the second fruiting season.

Farmers who attended the technology forum and field days showed interest to the technology and 20 of them attended the trainers'

turn to page 7



RDMIC Bldg., Visayas Ave., cor. Elliptical Rd.
Diliman, Quezon City 1104
PHILIPPINES

IN THIS ISSUE...

First GAP certified mango farm	1
Gawad Saka Review and Planning	2
Phase 2 of Cybervillage project	3
Enhancing inst'l capabilities	4
BAR's first regional seminar	6
Mushroom Coop in Region 3	7
Bicol eyes first locally-produced	8
BAR joins UPLB Green Agri	9
"No soil" technologies: The way	10
Technologies on taro	11
Culturing Tikod Amo through	13
Making the "face of BAR"	15

Gawad Saka Review and Planning concludes

In an effort to energize the Gawad Saka Search and to sustain the award for the outstanding achievers in agriculture and fisheries, a four-day workshop was held in Tagaytay City. The activity was attended by seasoned experts in overhauling the categories, criteria, and policies to ensure that the Search remains a relevant undertaking.

Gawad Saka Chairperson and Department of Agriculture (DA) Assistant Secretary Edilberto M. De Luna underscored the role of each category in coming up with an enhanced and updated criteria. "In evaluating the nominees, consider the impact or the magnitude rather than the quantity of their work. Through our collective efforts in recognizing individual contributions to the betterment of agriculture, the trust and confidence of people in the DA have been restored," he said.

For each category, their respective guidelines and evaluation criteria, and plan of activities for 2013 were reviewed. The budgetary requirement for holding the Search was also discussed.

This year, the Bureau of Agricultural Research (BAR) proposed to send the winners of Outstanding Agricultural Scientist and Researcher overseas with the objective of capacitating them with advanced agricultural technologies.

During the open forum, BAR Director Nicomedes P. Eleazar



BAR staff/members of the Search for the Gawad Saka Outstanding Scientist, Researcher together with DA Asst. Sec. Edilberto M. De Luna (middle) and BAR Dir. Nicomedes P. Eleazar (4th from right)

suggested to include anew the Outstanding DA Employee category to recognize DA personnel who are worthy of emulation. It could be recalled that he was once a recipient of the Outstanding DA Employee in Planning in 1991.

Ms. Maritess Bernardo of the DA-Office of the Secretary (OSEC), a pioneer in the Search, enumerated the subcategories for the Outstanding DA Employee, namely: 1) planning, 2) operations, 3) regulations, and 4) support staff.

Director Eleazar also reiterated that the Gawad Saka Outstanding Researcher is limited to DA personnel only. This is to give credit to the colleagues in the Department for their outstanding accomplishments and for playing an important role in building

up the image of DA.

Meanwhile, OIC Director for Administrative Services Rebecca E. Badiola explained how Gawad Saka has evolved through the years while some participants shared their experiences as evaluators and enjoined the other committees to simplify the evaluation process.

"To determine the success of the Gawad Saka Search, it is necessary to conduct an evaluation of the previous winners' present economic status, innovations, and number of adaptors. If those winners, being national awardees, have failed to positively influence their community, then the award was just taken for granted," Asec. De Luna emphasized.

BAR focal persons, led by

turn to page 7

MAKING THE "FACE OF BAR" MORE VISIBLE ONLINE

by Patrick Raymund A. Lesaca

The development of information technology (IT) in the country is unstoppable. It has already shaped the lifestyle of the Filipinos in their personal lives in terms of communicating, doing business, and studying, among others. In the business communities, IT has become a potent tool for development and advancement. Even in the farming and fishing sectors, information driven systems and technologies are generating the necessary measures to achieve maximum potential of any farm produce.

Various government agencies are taking advantage of this position to promote their plans and programs for the benefit of the citizenry. The utilization of technological development and deployment are seen as emerging trends for the government and the private sectors alike.

The Department of Agriculture

(DA) is one of the agencies of the national government that is taking advantage of the effectiveness of the IT system. Now, with just a click of a finger, information and data are readily available in real-time, thanks to the World Wide Web.

As of this writing, close to 7,217,412 individuals visited the official website of DA. The site primarily contains what the agency is all about, its vision and mission statements; plans and programs; news and features; farming and fishing tips; latest statistics on crops, fisheries, livestock, and poultry. Research papers and scientific journals are uploaded either in paid or in an open access (free) domain for the use of research institutions, scientific communities, researchers, and students alike.

In a nutshell, the DA website serves as the central hub of all its

agencies and offices. For instance, the Bureau of Agricultural Research (BAR), one of its staff bureaus, is tasked to coordinate the research and development programs within the DA. The bureau must see to it that IT systems are readily available to all end-users and the public.

In 2000, the National Information Network was established primarily to interconnect institutions, agencies, bureaus, and other entities under the DA paving way for the establishment of the Agriculture and Fisheries R&D Information System (AFRDIS).

BAR joins IT bandwagon

IT plays an important role in the operations of BAR, being the national coordinating agency for R&D. In 2000, the official face of the bureau in the web was formally launched with the deployment of 107 workstations connected to the internet and intranet enabling the bureau to operate effectively. In the same year, the agency started

the regular monthly publication of BAR Chronicle and the quarterly publication of BAR Digest. Originally, the Chronicle and Digest were produced at 500 and 1,000 copies, respectively. To date, the Chronicle is being produced at 2,500 copies (due to numerous requests for subscription) while the Digest still pegged at 1,000 copies.

The Chronicle and Digest are regular features of the website. Interested readers and researchers are encouraged to visit the site and navigate the "Publication Section" within the system for free access. Electronic copies can be viewed through the website.

Like the websites of DA and other agencies, the BAR website contains the vision and mission statements; existing R&D plans and programs; strategic R&D approaches;

turn to next page



BAR CHRONICLE is published monthly by the Applied Communications Division of the Department of Agriculture - Bureau of Agricultural Research, RDMIC Building, Visayas Avenue, cor. Elliptical Road, Diliman, Quezon City 1104 Philippines.

This publication provides regular updates on DA-BAR's activities as the country's national coordinator for agriculture and fisheries R&D. It also highlights features and news articles concerning NaRDSAF-member institutions.

PRODUCTION TEAM

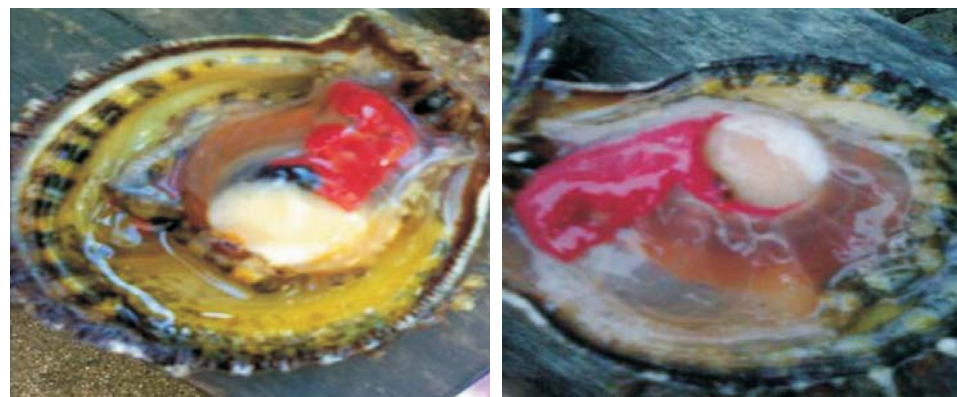
Editor:	Rita T. dela Cruz
Consulting Editors:	Julia A. Lapitan and Victoriano B. Guiam
Layout:	Anne Camille B. Brion
Writers:	Ma. Eloisa H. Aquino, Liza Angelica D. Barral, Anne Camille B. Brion, Rita T. dela Cruz, Diana Rose A. de Leon, Patrick Raymund A. Lesaca, Leila Denisse E. Padilla, Jacob Anderson C. Sanchez
Reproduction/Printing:	Ricardo G. Bernardo and Lino Norman D. Reyes
ACD Head:	Julia A. Lapitan
Adviser:	Dr. Nicomedes P. Eleazar, CESO IV

ISSN 1655-3942

Copyright Bureau of Agricultural Research, Department of Agriculture 2013.

For subscription and inquiries please contact us: Tel. Nos: +63 (2) 928-8505, 928-8624, 920-0234 local nos. 3011, 3012, 3328 Fax No. +63 (2) 927-5691 Email: rd@bar.gov.ph

Articles are also available online, visit our official website: <http://www.bar.gov.ph/barchronicle>



Tikod Amo, an endemic oyster species thriving in the coastal waters of Lianga Bay, Surigao del Sur, got its name from its adductor muscle which looks like a heel of a monkey.



PHOTOS: GASUFRE/SDSSU

may produce the key to restoring depleted areas.”

One of the key recommendations of the group of Asufre is using the “bottom polyculture” in culturing *Tikod Amo*.

Polyculture is the practice of culturing more than one species of aquatic organism in the same pond. The motivating principle is that fish production in ponds may be maximized by raising a combination of species having different food habits. The concept of polyculture of fish is based on the concept of total utilization of different trophic and spatial niches of a pond in order to obtain maximum fish production per unit area. The mixture of fish gives better utilization of available natural food produced in a pond. The compatible fish species having complimentary feeding habits are stocked so that all the ecological niches of pond ecosystem are

effectively utilized (Singh, 2013).

Compared with monoculture system of fish, the possibilities of increasing fish production per unit area, through polyculture, is considerably higher and more profitable. This is because combining different species in polyculture system effectively improved the pond environment.

“For growing *Tikod Amo*, we recommend the bottom polyculture. It's culturing the oyster at the bottom of the pond. We grow these oysters together with seaweeds and fishes like milkfish, grouper, and siganid in the mariculture areas of Barobo Bay,” explained Asufre.

The integration of oysters in a polyculture system may be applied on 146 hectares of fishpens in the mariculture zone.

According to Asufre, this kind of culture system will not only increase the production of *Tikod Amo*,

together with other species, but it will also expand employment both among mariculture fishermen and oyster gatherers. ###

For more information on Tikod Amo and its culture technology, please contact Ms. Gemma A. Asufre (SDSSU) through her mobile number: 0946-333-0229

References:

1. Asufre, Gemma A. (2012). *Preliminary Study of Tikod Amo on its Potential as an Oyster Culture Species. Unpublished Terminal report submitted to DA-BAR.*
2. Singh, Prabjeet, et al. (2013). “Polyculture - A culture practice to utilize all ecological niches of pond ecosystem effectively.” *Aquafind: Aquatic Fish Database. Retrieved on 11 March 2013 from <http://aquafind.com/articles/Polyculture.php>*

Phase 2 of Cybervillage project reviewed; 2013-2014 plans laid out

The International Rice Research Institute (IRRI) and the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) convened all the proponents from Luzon, Visayas, and Mindanao to review the project, “Enhancing Knowledge Exchange and Decision-making among Rice Stakeholders through the Development and Promotion of Location-specific Rice Knowledge Products and Delivery Systems,” also known as the “Cybervillage Project Phase 2.” The activity also aimed to form the project's action plan for 2013-2014.

The project review and planning was held subsequently in Visayas (Guimaras) on 18-19 February; in Mindanao (Samal Island) on 20-21 February, and in Luzon (Olongapo City) on 27 February-1 March.

Participating in the activities were proponents from the Philippine Rice Research Institute (PhilRice), local government units (LGUs), non-government organizations (NGOs), DA-Regional Field Units (RFUs), and state universities and colleges (SUCs).

Serving as a support project to existing information and communications technology (ICT) programs such as the e-extension and the Farmers' Information and Technology Services (FITS), the ultimate objective of this project is *to help improve farmers' productivity by improving their access to and application of rice and other related knowledge, through the use of alternative models of technology transfer combined with relevant ICT* (Revised Proposal, 2010).

Distinctively, it aims to: 1) further test and develop approaches in solving with the range of problems faced by farmers, 2) identify how best to make these options more widely known at the village and municipal levels through the use of ICT, and 3) further study the effectiveness of computer-based information and knowledge dissemination to rural farmers and extension workers at the whole municipal level. Based on these

objectives, the accomplishments of the project were reviewed and evaluated.

In Visayas, stakeholders in the project sites were capacitated on the use of Pinoy Rice Knowledge Bank (PRKB) in compact disc (CD) modality and Nutrient Manager for Rice (NMR) for android through seminars and trainings. Demo



Mr. Ben Pamamat (left), assistant scientist of IRRI, talks about the Cybervillage project while Ms. Maria Eda Apple Suplido (right), assistant scientist of IRRI, discusses about the nutrient manager for rice (NMR).



Participants from IRRI, BAR, PhilRice, NGO, SUCs, RFUs and attached agencies, and LGUs pose for a group photo.



Mr. Rodolfo Fernandez, BAR coordinator for rice, emphasizes the importance of unity and perseverance among the stakeholders in attaining the project's goals.

farms, which allotted an area for farmer's practice and NMR intervention, were established. However, problems on computer availability and internet connectivity impeded the anticipated impacts of this project. Most of the involved barangays have no computer or no internet connection and they resorted to using the CD modality for PRKB and the android mobile for NRM. The stakeholders resolved to include setting up of internet connectivity and obtaining computers for the project sites in need as one of

their plans for 2013. Their 2013-2014 plans vis-à-vis budget allocation include the conduct of more capacity-building activities (i.e. basic computer operations, seed production, and pest and diseases identification and control), Cybervillage Awareness Day/Nutrient Manager for Rice TechnoClinic, and farmers' field day.

In Mindanao, cyber units in most of the project sites were established with at least one computer with internet connection. These enabled the stakeholders to fully utilize the PRKB and NMR. Trainings on ICT, seed health, and pest management were conducted. Farmer's practice and NMR demo farms were also established and are regularly monitored.

turn to page 9

Enhancing inst'l capabilities of 3 R&D centers in CAR



IDG project in BFAR-CAR

PHOTOS:JSANCHEZ/IDD

The Bureau of Agricultural Research (BAR), through its Institutional Development Division (IDD), conducted an assessment and validation of its funded Institutional Development Grant (IDG) projects in three provinces of Cordillera Administrative Region (CAR), namely: Ifugao, Mountain Province, and Benguet from 26 February to 1 March 2013.

These landlocked provinces in North Luzon located at the forehead of the Philippines are bordered to the north by Kalinga and to the south, east, and west by Regions 1 and 2. With its naturally crafted hilly terrain, numerous zigzag roads connecting municipalities to other towns, and an elevation close to the sky, travelers have a perfect view of the vast upland rice fields on the wayside.

Given these geographical conditions and relative isolation, places such as these are a primordial source of heirloom practices passed over from generation to generation. However, as a remote area, it demands more attention from the government to preserve its flora and fauna, and to sustain its agriculture which is now being undertaken with support coming from the Department of Agriculture (DA).

It is for this reason that BAR is working to enhance the institutional

capabilities of the country's overall agriculture and fisheries RDE system, particularly the National Research and Development System for Agriculture and Fisheries (NaRDSAF) member institutions, through funding for the acquisition of modern laboratory equipment, information technology wares, construction and renovation of R&D facilities, and for research manpower development.

"The marching order of Secretary Alcala to upgrade the countries' research centers has been our thrust to intensify and reinforce the modernization of R&D facilities nationwide," said BAR Director Nicomedes P. Eleazar.

To ensure that these projects are abiding with the terms and conditions stipulated in contracts with BAR and approved proposals, and to assess the actual physical condition of R&D facilities and equipment, BAR undertook the assessment and validation of these IDG projects. Led by IDD Head Digna L. Sandoval, the team was composed of IDD staff, namely: Elvira S. Rapada, Iluminada M. Ching, Upjohn D.G. Rivera, and Jacob Anderson C. Sanchez. Also identified during the visits were the



IDG project in IFSU



IDG project in the Provincial Agriculturist Office in Bontoc, Mountain Province

R&D needs of the various institutions.

Sustaining traditional farming system

For lack of arable land, the Ifugao people were forced to make a living from the mountains by terracing rice paddies on the slopes. Not only did they carve the terraced paddies, but they also established a unique irrigation system and a way of maintaining them through constant repair and extension.

Today, some of them have shifted their livelihood from the *kaingin* system of rice production to fruit tree plantation since it provides a continuous income while maintaining a green forest. One IDG project of the Ifugao State University (IFSU) is the "Establishment of Pomelo Clonal Multiplication Facility". Its main objective is to provide a continuing source of pomelo planting materials for farmers. However, the damaging effects of the recent typhoons have ripped the roofing of the facility that has been exacerbated by pest and

turn to next page



PHOTO:GASUFRE/SDSSU

Culturing *Tikod Amo* through bottom polyculture

by Rita T. dela Cruz

Tikod Amo is the local name of an endemic oyster species known to the people living in the Barobo Coastal waters in Lianga Bay, Surigao del Sur. This unique oyster got its name because its adductor muscle resembles that of a monkey's heel.

According to Gemma A. Asufre, researcher from the Surigao del Sur State University (SDSSU), this oyster species seemed to be unknown in the international species nomenclature database as no information that describes its biological features was found. Hence, it was assumed that *Tikod Amo* is a new species under the genus *Spondylus*.

The researcher from SDSSU is further trying to determine its species identification as this is crucial in the culture of this endemic species. *Tikod Amo* is even aesthetically attractive with the five colors of its internal parts. Its closest relative is the *Spondylus squamosus* with five percent difference in DNA to *Tikod Amo*.

Although unknown to many, this endemic oyster species is said to be delicious and tasty, making it a favorite seafood delicacy among the locals. Catching *Tikod Amo* has also become a good source of income among the marginalized fishers in the coastal areas of Surigao del Sur.

Given its high demand locally, the price of *Tikod Amo* is higher than the price of any ordinary oyster meat

available in the market. Its current price in the market is at P400 per kilo for the unshelled meat. With such demand, the local production cannot adequately supply the local hotels and restaurants.

Internationally, it is also gaining popularity. Among the foreigners who came to know about this rare oyster species, *Tikod Amo* has become a hit, merely out of curiosity of its distinct taste. In fact, Asufre revealed that "Koreans and Chinese who come to the Philippines to buy sea cucumber for export are also willing to export *Tikod Amo* if there's a supply. One interested supplier wanted to buy at least 300 kilos per week."

With the increasing demand for *Tikod Amo* and the constant harvest, the natural stock of this oyster in the wild is now being threatened. Also, the practice among gatherers of collecting *spat* (baby oysters) from the wilds is not sustainable and it poses a threat, not only to the diversity of oyster species in the area, but also to

the hard coral substrates where these species naturally dwell. As a result, oyster catch have declined by 40 to 60 percent between 2006 to 2008.

To further mitigate the possible direct impact of this kind of practice to the environment, particularly the sustainability of its production, the potential of *Tikod Amo* as an oyster species was studied. Hence, the project titled, "Preliminary Study of *Tikod Amo* on its Potential as an Oyster Culture Species" was implemented by SDSSU with funding support from the Bureau of Agricultural Research (BAR). The study, initiated in 2008 and completed in 2010, was led by Asufre and Miguel O. Baay, assistant regional director of the Bureau of Fisheries and Aquatic Resources (BFAR), CARAGA.

One of the important results that the study generated is the culture technology of *Tikod Amo*. Asufre said that, "aquaculture of *Tikod Amo* offers a great opportunity for learning about its biology and

turn to next page

Compared with monoculture system of fish, the possibilities of increasing fish production per unit area, through polyculture, is considerably higher and more profitable.



PHOTO:RBERNARDO

With BIARC's undertaking on the rapid propagation of taro through tissue culture techniques, tissue cultured taro grown were found to be less prone to yellowing of leaves and damage than those planted using the traditional methods.

PHOTO:DDELEON
Prof. Rolly de Asis explains the mechanisms of the taro drying machine.PHOTO:DDELEON
The fabricated drying machine produces high-quality taro products.PHOTO:DDELEON
Prof. de Asis (3rd right) and Prof. Perlas (2nd right) of CBSUA, together with the staff, show the taro drying machine and the finished product to the BAR monitoring team.

them to various stakeholders.

One of the notable results of the study was that the tissue cultured taro was less prone to yellowing of leaves and damage as compared to those planted using the traditional means. BIARC also established and instituted the protocol for the micro propagation of taro.

As of November 2012, the project was able to achieve 100.31 percent of its annual target. Targeting 1,600 taro corms in a year, they were able to collect 1,605 taro corms. To date, they already distributed 530 plantlets to farmers and other interested clientele.

Standardization of pre and postharvest practices of taro

The Central Bicol State University of Agriculture (CBSUA), on the other hand, aimed to develop a package of technology for pre and postharvest practices for taro to be disseminated to farmers in Bicol region.

Prior to the project, there was no standard protocol or guide on cultural management practices and postharvest handling

techniques for taro that the farmers could follow. This made the quality of taro produce to suffer especially those products which are for export.

The study aimed to have: 1) broad perspective on the existing pre and postharvest practices in Bicol region, 2) germplasm collection of taro, 3) multi-location fertilization and varietal performance trials for taro, 4) integrated pest management of taro, and 5) good manufacturing practices (GMP) for taro leaves.

As of now, they were able to gather, identify, and characterize 17 taro varieties in Bicol region and identify the diseases, insects, and weeds associated to taro. For the GMP, they were able to fabricate a prototype of a solar dryer for the processing of taro leaves. ###

disease outbreaks which caused losses in seedlings.

"We need to improve the management of our pomelo multiplication facility to recover from the losses and produce disease-free seedlings," said Dr. Ricardo Ildefonso, director of IFSU.

With their traditional farming practices, the Ifugao people have produced organically-grown upland brown rice which remains to be a hit among tourists. Aware that the use of synthetic chemicals is slowly poisoning the environment and the consumers, IFSU partnered with BAR through a project, "Upgrading of the Existing Bio-Organic Fertilizer R&D and Production Facility" which hopes to increase the production of compost and to establish confidence to farmers in using it.

Keeping the heirloom tradition alive

The introduction of high yielding rice varieties has placed traditional or farmers' varieties and breeds at low priority and high risk. Characterized by a unique aroma, color, taste, and high nutritional values, heirloom rice has huge export potential for as long as the quality standards required by the market are attained.

To ensure that these lines are constantly planted, the Provincial Agriculture Office of Bontoc, Mountain Province tied up with BAR for the project "Establishment of Research and Development Center for Heirloom Rice." This IDG project funded in 2011 has equipped the cooperators with rice miller, thresher, dehuller, and seed storage, to name a few.

Half freezing, half amazing

Known for its cool, cloud-covered mountains, Baguio is a planned city with plenty of botanical and vegetable gardens. But despite its skyscraping elevation, it has found an amazing way of establishing and maintaining its natural as well as man-made water reservoirs as sources of freshwater fishes for the household.

To keep up with the challenging and changing environment, the Bureau of Fisheries and Aquatic Resources (BFAR) based in the city partnered with BAR in the

"Improvement of the BFAR-Regional Fisheries Research and Development Center" and "Construction of Pond Dike and Pond Division." The projects included the provision of ICT equipment to document their RDE activities, laboratory equipment for routine microbial testing, and improvement of fish ponds.

"With our modern equipment and facilities, we are positive that there will be a mark up in fisheries productivity this year," said BFAR-CAR Assistant Regional Director Lois June Fermin.

At present, they are pursuing the establishment of aquaponics which they found to be a good fit in urban conditions.

Meanwhile, the team also visited the IDG project of the Bureau of Plant Industry-Baguio National Crop Research and Development Center (BPI-BNCRDC) titled, "Improvement of Facilities and Equipment for a Sustained and Stable *ex situ* Conservation of Vegetable and Fruit Germplasm Resources." Its acquired resources consisted of an ELISA plate reader, orbital shaker, and perimeter fencing, among others.

Ms. Sandoval, who happens to be a project leader of a BAR study on *Solanaceous* crops, suggested incorporating tomato, eggplant, and pepper among the researchable crops of the center.

The last destination set was the DA-CAR Integrated Agricultural Research Center (CIARC). The center features a vegetable garden, edible landscape, and an assortment of anthuriums. It also takes pride on its sweet-scented herb called *tarragon*, which when mixed with honey, makes a relaxing tea.

An assessment of their facilities was

conducted vis-à-vis the presentation of their manager, Dr. Magdalena Wanawan. It was noted that their building and facilities needed improvement. During Dir. Eleazar's visit to the center, he encouraged Manager Wanawan to propose more projects that will pave for the construction and rehabilitation of the research center to further strengthen their capabilities on R&D. The bureau chief also visited an apiary, an organic farm, and a vermicast facility being maintained and managed by CIARC.

An IDG project is hoped to be funded by the bureau to cement Benguet's rank as *Salad Bowl of the Philippines*. ### (Jacob Anderson C. Sanchez)

PHOTO:MVALDEABELLA
Dr. Magdalena Wanawan (left), CIARC manager, together with her staff, welcomes BAR Dir. Eleazar (2nd from left) during his visit at the research center.PHOTO:MVALDEABELLA
Dr. Wanawan shows Dr. Eleazar the small apiary which the center manages in support to the Apiculture Program of the Department of Agriculture.PHOTOS:JSANCHEZ
Dr. Wanawan (2nd from left), accompanies BAR staff during an assessment of the center's facilities.PHOTO:JSANCHEZ
BAR staff examines the ELISA plater, one of the acquired equipment under an IDG project in BPI-CAR.



PHOTOS: LBARRAL

BAR'S first regional seminar series kicks off in Region 10

In an effort to disseminate and promote new information generated from its funded research and development (R&D) projects, the Bureau of Agricultural Research (BAR) conducted the first ever regional seminar series featuring Edible Landscaping (EL) on 13 March 2013 at the Department of Agriculture-Northern Mindanao Integrated Agricultural Research Center (DA-NOMIARC) in Dalwangan, Malaybalay City.

Dr. Fernando C. Sanchez Jr., vice chancellor for Planning and Development of the University of the Philippines Los Baños (UPLB), discussed the concept, components, and benefits of Edible Landscaping. The resource speaker, who is also the project leader of EL, ran down the elements and principles of design so that the participants can fully grasp the idea of edible landscaping.

During the presentation, Dr. Sanchez emphasized that EL does not only promote attractive landscape, but it also supports in attaining food security at the household level. Further, this new concept recognizes the importance of organic agriculture in helping protect the environment.

Mr. Ryan Tayobong, Instructor 1 from the Institute of Plant Breeding of UPLB, discussed the design process and the important points to consider in creating a base map.

For practical application, the participants conducted site orientation and evaluation, followed by the conceptualization and creation of a base map and master plan.

Dr. Sanchez evaluated the outputs of the participants for the group's future implementation of their edible gardens.

The participants acknowledged the collaborative efforts of DA-BAR, NOMIARC and the UPLB-EL Team in conducting the seminar series because the topic is very timely since some of the participants are planning to put up a garden in their respective areas.

The attendees of the seminar were selected staff from the DA-Regional Field Units (RFUs) and Provincial Local Government Units (PLGUs) in Visayas and Mindanao.

BAR will conduct the next regional seminar series in Edible Landscaping in Bicol, Cebu, and Bohol. ### (Liza Angelica D. Barral)



Dr. Fernando C. Sanchez Jr. explains the concept of Edible Landscaping and the different design ideas.



Mr. Ryan Tayobong discusses the points to consider in creating a base map using the bubble diagram.



Ms. Julia A. Lapitan, head of BAR-Applied Communications Division, explains the rationale behind the conduct of the regional seminar series.



PHOTO: ABRON

Technologies on taro standardize in Bicol

by Diana Rose A. de Leon

Taro (*Colocasia esculenta*), locally known as *gabi*, is a major crop grown in Bicol. Its leaves are the primary ingredient for Bicolandia's famous dishes including *pinangat* and *laing*.

The demand for taro is increasing. Like other rootcrops, taro is

a food staple in some parts of the country. It contains twice as much carbohydrate found in potatoes. It is a good source of dietary fiber and is considered as a low fat food. It is rich in magnesium, vitamin C, iron, and potassium. According to the Department of Science and Technology

(DOST), taro has low glycemic index thus good for people with diabetes.

To strengthen the taro industry and support the farmers in Bicol region who are engaged on taro planting, several projects have been funded by the Bureau of Agricultural Research (BAR) including two taro projects that were recently monitored by the bureau.

Propagation of taro through biotechnology

To make the taro become more competitive in the market, the Bicol Integrated Agricultural Research Center (BIARC) harnessed the potential of biotechnology in producing good quality and healthy taro materials. The Department of Agriculture-Biotechnology (DA-Biotech) Program, through BAR, facilitated the funding of a project titled "Rapid Propagation of Taro through Tissue Culture Techniques".

The aim of the project is to develop a protocol for micro propagation of taro, and mass produce disease-free plantlets of elite taro variety and distribute

turn to next page

waste involved because of the continuous recycling that goes on.

Hydroponics and aquaponics are two innovative methods of growing crops. Unlike traditional agricultural methods, they do not use soil. The main difference between the two is that aquaponics takes the ingenuity of hydroponics one step further by symbiotically combining a hydroponic growing system with aquaculture.

Dr. Sace also highlighted the benefits and advantages of the systems that could eventually address food supply concerns. For instance, he said, the system could improve plant nutrition, minimize if not eliminate soil diseases and insects, plants mature faster, working condition is clean and comfortable, and more importantly this could be set-up in rural and highly urbanized areas.

The concept of urban farming is gradually gaining acceptance not only as backyard farming practices, but this could also be developed into a full-scale commercial farming operations and thus increase employment and opportunities to urban communities.

Dr. Sace obtained his MS and PhD in Agricultural Engineering at CLSU and has written a number of publications including Growing Dragon Fruit in our Backyard, Hydroponics Can Revolutionize Philippine Agriculture, Greenhouse Economics, among others. His expertise includes tropical greenhouses, aquaponics, hydroponics, and pressurized irrigation.

The BAR Seminar Series is a monthly activity of the bureau highlighting various R&D related technologies. ### (Patrick Raymund A. Lesaca)



Dr. Sace discusses on the potentials of hydroponics and aquaponics systems in contributing to food security and sufficiency.

PHOTO: ZREYNOSO



“No soil” technologies: The way to the future

“The world will lead to hydroponics as the future of agriculture,” said Dr. Chito F. Sace, associate professor of the Central Luzon State University (CLSU) and resource speaker in a seminar series organized by the Bureau of Agricultural Research (BAR) on 15 March 2013.

Dr. Sace presented the principles and benefits of hydroponics and aquaponics systems as viable methods in raising crops and fishes to contribute to food security and sufficiency initiatives of the country.

He substantiated a report published by the Food and Agriculture Organization (FAO) of the United Nations that food insecurity in developed and developing countries are imminent. According to the report, around 925 million people are chronically hungry due to poverty and 2 billion people lack food due to insufficiency.

Dr. Sace said that based on another publication (Philippines: Deterrents to Agricultural

Production, Dolan, 1991), over-population; declining arable land; water shortage; and climate change are considered major impediments for sustainable agriculture and fisheries. Increasing urban settlers, high cost of agricultural inputs, decreasing soil productivity, among others constitute direct and potential threat to improved production. However, amidst the threat of food shortage, FAO predicted that the abundance of food supply in the coming years will be achieved through advanced backyard farming technologies and smart farming systems.

He downplayed the fact that the Philippines is capable of increasing the production of some of its agricultural crops by looking into the potentials of hydroponics and aquaponics systems. He added that such technologies prove that soil is no longer crucial for the plant to thrive.

Hydroponics is derived from two Greek words, *hudos* which means water, and *ponos* which means labor. It literally means water-working or vegetable production in soilless

culture. In a hydroponic system, plants are placed in nutrient-enriched water. Some hydroponic systems also use inert mediums such as gravel, sand or vermiculite. The plants placed in the water easily absorb its nutrients. Once the nutrients in the water are used up, they are recycled or additional nutrients are added. The system also shows much higher crop growth and yields, which makes it very profitable. It is also useful in areas where crop cultivation in the soil is not a viable option.

Meanwhile, in aquaponics system, one of the components is a hydroponic bed wherein crops are grown with the use of nutrient-enriched solution. The other component is a tank or aquarium wherein fishes are grown. These two systems co-exist and depend on each other for growth. As the fish grows, the tank becomes filled with excreta and other waste matter. It provides a harvest of crop as well as fish without the need for soil. There is no

turn to next page

Mushroom Coop in Region 3 develops various mushroom products



PHOTO: MEAQUINO

With funding support from the Bureau of Agricultural Research (BAR) under its National Technology Commercialization Program (NTCP), the Department of Agriculture-Regional Field Unit (DA-RFU) III is currently implementing a project titled, “Lowland mushrooms (*Pleurotus* and *Volvariella*) product development and packaging for commercialization.”

Part of the components of the project is the conduct of trainings and seminars to be attended by mushroom growers in the regions. The graduates of these trainings and seminars have adopted the technologies and interventions introduced through the

project. From being farmer-adopters, the group has established an association which consequently outgrown as a cooperative.

The Mushroom Producers Cooperative is composed of mushroom growers from the towns of Paniqui, Gerona, Anao, Victoria, and Pura in Tarlac Province and one member from Muñoz, Nueva Ecija.

The two-year project aims to optimize mushroom product development and evaluate appropriate packaging for each mushroom product with emphasis on good manufacturing practices.

Prior to the implementation of the NTCP initiative, a project titled, “Product development and commercialization of lowland mushrooms for village level production” was implemented in 2009 specifically to address spoilage concerns of fresh mushrooms. Mushrooms were developed into processed products including pickled mushroom, jam, meals (*siomai*, burger, *bola-bola*, and *sisig*), *tocino*, mushroom longganiza, mushroom candies, crackers, cookies, polvoron, wine, *pandesal* with *malunggay*, *barquillos*, and mushroom powder.

“Products greatly extended the shelf life of harvested mushroom fruits from 1 to 14 months depending on packaging and storage,” reported Ms. Emily Soriano of DA-RFU III in her presentation during the “Terminal Review of BAR-funded projects under the National Technology

turn to page 9



PHOTO: LARIZABAL
Ms. Emily Soriano of DA-RFU III presents the accomplishments of the mushroom project.

First GAP certified...from page 1



PHOTO: NDELROSARIO & LAPADILLA
Mr. Tulabut demonstrates the proper packaging of mangoes to secure good quality and physical appearance.

training on GAP for mango held in Iba, Zambales,” explained Mr. Tulabut.

The project proponents aim to intensify the promotion of GAP to mango farming communities in the province not only to increase productivity and global competitiveness but also to ensure safe, high-quality mangoes on every consumer's table. ### (Leila Denisse E. Padilla)

Gawad Saka Review...from page 2

IDD Head Digna L. Sandoval, prepared and consolidated the suggestions and recommendations to improve the guidelines for the Gawad Saka Outstanding Scientist, Researcher, one of which is to advertise the Search using various multimedia such as television, radio, magazines, and newspapers.

The Gawad Saka winners for this year are expected to be announced on August 2013 while the awarding ceremony is hoped to be held again at the Malacañang Palace with President Benigno Simeon Aquino III gracing the momentous event. ### (Jacob Anderson C. Sanchez)

Bicol eyes first locally-produced sesame oil

While sesame candy is the most popular sesame product, the Bicol Integrated Agricultural Research Center (BIARC) of the Department of Agriculture-Regional Field Unit (DA-RFU) V, together with the local government of Nabua, Camarines Sur is now embarking on an initiative that will enable the development of the first locally-produced sesame oil.

This undertaking serves as an offshoot activity of a project titled "Enhancement of Sesame Farming System in the 4th District of Camarines Sur" funded by the Bureau of Agricultural Research (BAR) under one of its banner programs, the Community-based Participatory Action Research (CPAR).

The project is divided into three components: technology evaluation and utilization, farmers' skills enhancement, and institutional development. In view of the first component, value-adding activities have been developed for the production of sesame products and by-products such as candies, the latest of which is the extraction of alternative and cheap oil from sesame seeds.

Sesame seeds are commonly used for culinary purposes to add a little twist on the flavor of ordinary tasting delicacies. These small creamy-white seeds



PHOTO:RBERNARDO

usually found on top of burger buns and coated on snacks such as *buchi* are found to be of nutritional value, being a good source of manganese, magnesium, and vitamins B1 and E, among others.

Sesame oil, on the other hand, is good for the heart, and was found to have high antioxidant content which is helpful in fighting free radicals, slowing down the aging process, and strengthening the body's immune system.

According to Ms. Ailyn R. Adante, project proponent, "there is demand for sesame oil, however, those available in the market are all imported. Hence, we thought of coming up with a procedure to extract oil from sesame seeds. If this undertaking becomes successful, we will be able to produce the first sesame oil that is from our very own country. This will help increase the farmers' income especially when it enters commercialization," she added.

Since they are still on the initial stage of trials (i.e. first extraction), there is no analysis yet for the produced oil. Further refining and improvement in its procedure are still being done. Currently, five kilograms of seeds is needed to produce one and a half liters of crude oil, or one liter after a series of filtration.

BIARC tapped the expertise of KOLBI Machineries in the fabrication of a sesame oil extractor. The equipment is undergoing continuous adjustments until the desired quality for sesame oil is met. ### (Anne Camille B. Brion)



Sesame seeds are being put in the sesame oil extractor



Extracted oil goes directly to a container



Filtration of extracted oil



Filtered sesame oil

PHOTOS:RBERNARDO

BAR joins UPLB Green Agri Trade Fair



Visitors of the booth are mostly composed of professors and students. PHOTO: LBARRAL

In celebration of the 104th Foundation Day of the University of the Philippines Los Baños-College of Agriculture (UPLB-CA), the Green Agriculture Trade Fair and Exhibit was held on 6-10 March 2013 at the CA Agripark, College of Agriculture, Los Baños, Laguna.

The Bureau of Agricultural Research (BAR) participated in the event through a booth exhibit showcasing the commodities and product displays under its National Technology Commercialization Program (NTCP) including sweet sorghum, *adlai*, *sapinit*, and soybean by-products like wine, jam, juice,

cookies, and hand sanitizer.

To provide information about the commodities on display, product brochures were distributed to visitors consisting mostly of students and professors.

Series of symposium on coconut, SNAP hydroponics, edible landscaping, Enriched Potting Preparation (EPP) technology, herbs and spices, and demonstrations on food processing were also conducted during the five-day activity.

Other BAR-funded projects implemented by UPLB also participated in the trade fair and exhibit including the Edible

Mushroom Coop in Region 3...from page 7

Commercialization Program (NTCP)" held on 20-22 March 2013 at Holiday Inn, Clark, Pampanga.

Ms. Soriano added that the estimated value-added income for producers range from 40 to 239 pesos per kilogram of mushroom fruits.

To date, new product lines were developed such as: noodles, muffins, marmalade, and mushroom fettuccine/linguine. A standardized processing protocol per product has been developed. As part of the project, product sensory evaluation test was conducted involving public school students, and attendees of Agri-fair, World Food Day, and DA-BAR mushroom training. This is to further improve product taste and packaging.

"Developed mushroom products are set to be submitted for nutrient analysis after the desired quality passed the consumer preference," Ms. Soriano shared.

In addition, 500 Overseas Filipino Workers in Hongkong were trained on mushroom production and processing. ### (Ma. Eloisa H. Aquino)

Landscaping of the Crop Science Cluster-College of Agriculture, agroforestry from the College of Forestry and Natural Resources, and ubi powder of the University of the Philippines Los Baños Foundation, Incorporated (UPLBFI). ### (Liza Angelica D. Barral)

Phase 2 of Cybervillage project...from page 3

Their 2013-2014 action plans included more trainings and workshops on computer operations and digital literacy, PRKB, web browsing and product value-adding, and the conduct of content development for cyber units and harvest festival on NMR.

In Luzon, trainings on ICT, seed health, pest management, PRKB, and NRM were held and the established demo farms were properly documented. Other activities like farmers' field day and technoclinics were also conducted to raise awareness and appreciation among stakeholders.

However, some cyber units have defective computers or none at all and

some project sites have slow or no connection to the internet due to the location and/or monetary matters.

On top of their plans was to set up strong internet connection and to obtain computers for the areas in need. Also, some flooded demo farms will be replenished to gain results useful for recommendations. More trainings and workshops will be conducted and will involve the youth as they are seen as potential infomediaries who can effectively assist farmers in utilizing different ICTs.

As found across all three regions, most of the problems arose in the availability and complexity of

computers and the internet which affects how stakeholders, particularly the farmers, accept and embrace the ICTs entailed in this project.

Hopefully through the planned trainings, seminars, caravans, and other activities, the communities involved will become technology-ready and knowledge-powered with ICTs by their side in achieving significant increase in rice productivity.

BAR on its part will remain an active partner in the succeeding phase of the project implementation. ### (Leila Denisse E. Padilla)