CONT...

DA staff...from page 4

of the fastest growing food production sectors in the world." In particular, ASEAN is considered a globally important aquaculture region with its diverse aquaculture systems and species. Report also stated that "aquaculture is a significant part of the economy, food supply and rural livelihoods within ASEAN." It has been noted that member-countries together produces 11.3 million tons or around 17 percent of the world's total production.

The participation of the DA staff in the international seminar is part of a WorldFish Center-BAR initiative that aimed to strengthen the capacity of BAR staff and the Philippine-based researchers in understanding the critical requirements for sustainable development that is market-oriented and responsive. The project, 'Aquaculture Technology Commercialization and Awareness Program (AQUATECH) in the Philippines Capacity Building Project," also hopes to provide opportunities for Filipino researches to participate in technical discussions and forums on sustainable agriculture development, market, and climate change.

The WorldFish Center is an international, non-profit research organization dedicated to reducing poverty and hunger thereby improving aquaculture and fisheries through research and development efforts. *(Ma. Eloisa H. Aquino)*

Reference:
http://www.thefishsite.com/articles/1146/aquaculture-in-the-asean-region

BAR, SEARCA...from page 6

BAR staff of the Applied Communication Division (ACD) led by its head, Ms. Julia A. Lapitan (left, standing) with staff members/writers (L-R): Rita dela Cruz, Anne Camille Brion, Zuellen Reynoso, and Leila Denisse Padilla, pose in front of the newly-renovated IRRI Riceworld Museum and Learning Center during the case study visit which is part of the BAR-SEARCA Training Workshop on KM.

Division (ACD), started the second day by giving a brief discussion on BAR's Research and Development Extension Agenda and Program (RDEAP) 2011-2016 which serves as a guide for projects to be in line with DA's agenda. Dr. Flor followed with his lecture on KM capacity building. He enumerated the skills, competencies, and qualifications needed to be a knowledge manager, as well as examples of capacity building activities undertaken by different organizations. He also delivered the last and final session entitled "The Way Forward". This tackled the essential elements needed for the establishment of a capacity development program starting with the formulation of an IKM strategic framework and a capacity development strategic plan for the agriculture and fisheries sectors.

BAR staff who participated in the training were ACD Assistant Head Rita dela Cruz; and information officers/writers, Zuellen Reynoso, Leila Denisse Padilla, and Anne Camille Brion. The second batch of the training workshop for Mindanao cluster is set on May 30-June 1 to be held at Davao City. *(Anne Camille B. Brion)*

BARChronicle
BUREAU OF AGRICULTURAL RESEARCH

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

Entered as second class mail at the Quezon City Central Post Office under permit no. 753-01 NCR

BAR Chronicle
BUREAU OF AGRICULTURAL RESEARCH
ISSN 1655-3942
Visit our official website at http://www.bar.gov.ph

Volume 13 Issue No. 4 | A monthly publication of the Bureau of Agricultural Research | April 2012

Dar's book launched at BAR

Dr. William D. Dar, (third from right) director general of ICRISAT and co-author, Prof. Arun Tiwari (third from left) of the University of Hyderabad, unveil the book, *"Feeding the Forgotten Poor: Perspectives of an Agriculturist"* to signify its official Philippine premier. Also in the photo are: (L-R) BAR Asst. Dir. Teodoro S. Solsoloy, Mrs. Anjana Tiwari, Mrs. Beatriz Dar, and BAR Director Nicomedes P. Eleazar.
PHOTO BY RDELACRUZ

A book,"Feeding the Forgotten Poor: Perspectives of an Agriculturist" authored by Dr. William D. Dar with Prof. Arun Tiwari, was launched by the Bureau of Agricultural Research (BAR), on 10 April 2012 at BAR, Visayas Ave., Diliman, Quezon City.

Dr. William D. Dar is the director general of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) while Prof. Arun Tiwari is the CEO of Indo-US Healthcare Pvt. Ltd. who also teaches at the School of Management Sciences in University of Hyderabad, India.

Gracing the activity were the authors, BAR Director Nicomedes P. Eleazar, Asst. Dir. Teodoro S. Solsoloy, and distinguished scientists and researchers from ICRISAT.

"The publication of this book is timely and relevant in the agriculture sector as it discusses two of the most compelling challenges of our time: food security and poverty. Agriculture is the nexus of hunger and poverty alleviation. Given today's growing world's population which is projected to grow up to 9 billion in 2050, the disconcerting question is— will there be enough food to feed the world? — to which the 144-page book tried to address in the perspective of an agriculturist," said Dr. Eleazar in his message.

Dr. Dar, in his response, expressed his gratitude to BAR for spearheading the book launch. He highlighted the long-time partnership of BAR and ICRISAT and how this served as fuel in implementing relevant programs and projects that would benefit the marginal poor of the Philippines.

On the book, Dr. Dar reiterated some of the earlier points highlighted in the message of Dr. Eleazar particularly on how agriculture becomes the nexus of hunger and poverty alleviation. The problem, according to him, "is not the lack of food, in fact we have enough food but the nexus is the capacity of the family to access food and this is due to

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Dr. William D. Dar (right), author of "Feeding the Forgotten Poor" providing Dr. Nicomedes P. Eleazar (left), a copy during the book launch at BAR.
PHOTO BY AGUMAPAC

Dar's book..from page 2

poverty, which synonymously leads to more people getting hungry."

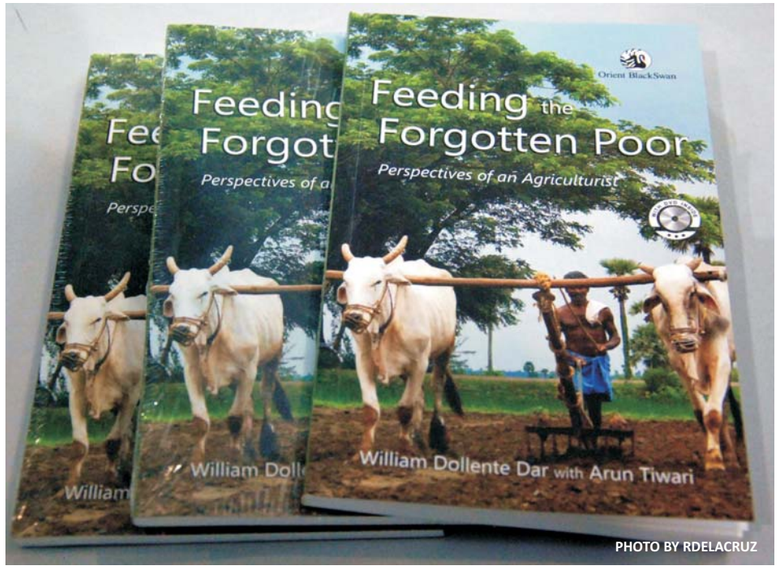
Co-author, Prof. Arun Tiwari said, "the process has to be recorded so that it could serve as an inspiration for the younger generation." He also cited their dream that one day "there will be no hungry person on this earth." But the challenge, according to Prof Tiwari remains, "how do we keep our people from being hungry amidst the many threats in the world."

Feeding the Forgotten Poor consists of four chapters, namely: 1) Soil and Roots, 2) Stems, Leaves and Fruits, 3) Skin of the Earth, and 4) Growth and Prosperity.

Prior to its Philippine premiere, the book was launched in New Delhi, India in February 2012 during the inaugural session of the 2nd Global Agri-Business Incubation Conference wherein former India President APJ Kalam graced the activity as keynote guest.

The book launch is part of the symposium titled, "Enhancing Philippine-ICRISAT Partnership in Agricultural Research for Development" which aimed to highlight the partnership between the Philippines' Department of Agriculture (DA) particularly, BAR and India's ICRISAT.

"In general, the Philippines has been benefitting from this strong partnership with ICRISAT which dates back since 1975. It was through this partnership, built and flourished through time, that the introduction of ICRISAT-bred materials, including peanut, sweet sorghum, pigeonpea, and



chickpea has been potentially realized," Dr. Eleazar cited.

According to ICRISAT, 3,302 samples of 2,786 germplasm accessions have been distributed to the Philippines. ICRISAT supplied 58 sets of trials, 901 advanced breeding lines, 36 mapping population parents, and 72 segregating populations to various institutions in the Philippines from 2000 to 2010.

"These efforts have led to the development and release of improved, high-yielding varieties. ICRISAT-supplied peanut germplasm line ICG 7827, which was released as UPL Pn 10 in 1992; Namnama-1 (ICGV 90320), was released in 2003 by Ilagan Experiment Station, Isabela; NSIC Pn 12, locally known as Ilocos Pink – was released in 2004 by the MMSU research farm at Dingras, Ilocos Norte. ICGV 00440 was released in 2007 as Namanama 2/NSIC Pn 14; and ICGV 86564 (Asha) in 2009 as NSIC Pn 15. Two sorghum varieties were also released in the early 1990s in the Philippines, and a total of 936 sweet sorghum seed samples were also sent to the country. Intensive testing and seed multiplication have also been done with pigeonpea," reported Dr. Dar.

Over 200 partcipants, including researchers and representatives from SUCs, RFUs, DA attached agencies and staff bureaus, attended the event. *(Rita T. dela Cruz)*

BARChronicle
BUREAU OF AGRICULTURAL RESEARCH

BAR CHRONICLE is published monthly by the Applied Communication 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.

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ISSN 1655-3942

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hectares. These will be paid by the cooperators after their harvests so that other qualified farmers could also avail of the same assistance.

They were given 50 heads of female ducks and 8 male ducks (drake) wherein the farmer cooperators provided the housing facility. Package of technology (POT) on duck/egg production was provided through training and seminars. The provision of *hito* or fingerlings as part of the IFS was optional. To optimize vacant farm areas like rice paddies and dikes, quality vegetable seeds were also provided.

For Brgy. Gaunan, which is basically an oil palm-based farming community, the IFS introduced to the 10 CPAR farmer-cooperators was the integration of livestock (goat), yellow corn, and vegetables.

"Most of the farmers in Gaunan are growing oil palm, hence, there are already existing, mature oil palm which we could tap for the project," revealed Catigbe. The farmer-cooperators were classified into two, those with the existing oil palm trees and those with the newly-established trees. As part of counterparting scheme, the provincial local government unit (PLGU) provided 640 quality planting materials of oil palm.

Intervention introduced in the newly-established oil palm was a recommended planting distance of 9.2 x 9.2 meters between hills and furrows for the 128 plants planted in a hectare of land. To optimize production, farmers integrated cash crops including corn and vegetables. For the farmer cooperators with the established oil palm, they integrated goat as additional income. POT on goat production was introduced through training and seminar.

Inputs provided were 5 bags of OPV corn seeds (USM Var 10), 30 bags of in of inorganic fertilizers, *pinakbet* vegetables seeds (*amplaya*, eggplant, squash, okra), 3 heads of upgraded does (female goat), and 1 buck (male goat) for the whole association. As counterpart, farmers provided the housing facilities. As a roll over scheme, assistance provided to the farmers must be paid for the next cropping in two-year period.

To capacitate farmer cooperators they were taught and trained on the various aspects of production. Information Extension and Communication (IEC) materials were also provided to serve as farmers' reference as well as field tour and site visits to successful farms to encourage them in improving their own farms.

Benefitting from CPAR IFS

Each of the components of the CPAR project has 10 farmer cooperators, all of which are members of the Lepaga and Gaunan CPAR Farmers Association (LGCFA).

Catigbe, in his report to BAR, mentioned that after two cropping seasons, data on average yield of rice using improved technology versus the conventional way of farming showed that farmer cooperators benefitted a difference of P8,500.

Farmer cooperator, Restituto Parreno, chair of the LGCFA, took the initiative in producing his own vermicompost in growing organic rice. His farm is considered a model for other rice farmers in Brgy. Lapaga.

Aside from the income from rice, with the integration of fish and other crops, farmers are earning additional profit. "Getting the average harvest, the 10 farmer cooperators obtained an annual average net income of P4,800 from their hito fishponds. Adopting the CPAR interventions, the farmer cooperators obtained a difference of P3360. Meanwhile from the vegetable production, average net annual income of the 10 FC was P1,250," reported Catigbe.

For the oil palm-based IFS, the five farmer cooperators (newly-established trees), earned an average annual net income of P45,520 while the other five (existing trees) had an average annual net income per hectare of P168,000.

Fatima Bagundang, farmer cooperator (newly-established oil palm), said that once the oil palm matures, they are able to harvest the fruits every 15 days. "We harvest 3 bunches (a bunch is 15 kg) and we sell the oil palm fruits from P6 to P6.50 a kilo." As the oil palm matures, the fruits get heavier so after four years, 3-4 bunches can be harvested from the tree, weighing 30-40 kg.

Tobias Gorit, farmer cooperator (existing oil palm), mentioned that, "goats were raised under the bearing oil palm trees providing us additional income. We also use the manure from the goats as inorganic fertilizer for the oil palm trees." ###

PHOTOS BY ACONSTANTINO AND RDELACRUZ


Mr. Arleen S. Catigbe, DA-CEMIARC senior agriculturist and CPAR project leader, showing the vegetable harvests from the IFS in M'Lang.


Fatima Bagundang, CPAR farmer cooperator, checks his newly-established oil palm.


CPAR farmer cooperator, Restituto Pareño and his wife harvesting vegetables.


Regular farmers' meeting with the CPAR implementers

M'lang farmers profit from CPAR

BY RITA T. DELA CRUZ

PHOTO BY ACONSTANTINO

Increase farm production and increase profit are the major considerations in implementing the Community-based Participatory Action Research (CPAR) projects, a flagship program of the Bureau of Agricultural Research (BAR).

In CPAR, specific technologies and interventions are being introduced and taught to the farmer beneficiaries particularly, in applying effective total farm productivity within the context of a sustainable production and farming system approach. Through this initiative, farmers are able to optimize the use of their lands and ensure available and affordable food for the family through the integration of crops, livestock, and aquaculture productions in the farming system.

One CPAR project that recently brought higher yield and profit to a farming community is the "Farming System Approach through Community-based Participatory Action Research (CPAR) in M'lang, Cotabato Province". The project, which started in October 2009 with funding support from BAR, is being implemented by the Departament of Agriculture-Central Mindanao Integrated Agricultural Research Center (DA-CEMIARC) in Aroman, Carmen, Cotabato.

Integrated approach to farming

An important strategy in implementing the CPAR project in M'lang, Cotabato is through an integrated farming system (IFS), a farming technique that combines high value crops, livestock and aquaculture in the production thereby optimizing the use and productivity of the farmer's land. IFS helps farmers in reducing inputs and increasing productivity because crop residues are fed to the animals while their manure is used as fertilizer. This system also enables farms to have a convenient and sustainable source of inputs.

The project has two major components, rice-based and oil palm based farming system, which were being implemented in the two municipalities of M'lang: Lepaga and Gaunan. According to Mr. Arleen S. Catigbe, senior agriculturist of DA-CEMIARC and project leader, "rice-based and oil palm based were chosen specifically for these two municipalities because they have the potentials in increasing productivity and sustainability. Moreover, Lepaga and Gaunan are among the depressed communities in M'lang, Cotabato.

Implemented in close coordination with the provincial and muncipal units of M'lang, "the objective of this CPAR is to improve farm productivity and rural income by promoting, adopting, and commercializing sustainable location specific farming system approach," explained Catigbe.

CPAR interventions

For Brgy. Lepaga, which is basically a rice-based farming community, integration of ducks, fish (hito/tilapia), and vegetables (pinakbet), were introduced to the 10 CPAR farmer-cooperators.

Aside from teaching them the appropriate IFS approach (including the proper combining of crops and optimizing land area), interventions were taught including the use of appropriate and improved varieties, Integrated Pest Management (IPM), and Integrated Nutrient Management (INM).

As cooperators for the project, farmers were provided with farm inputs and resources which were good for 10

PHOTO BY DBATTAD

BAR conducts CPAR re-orientation for Luzon implementers

In line with strengthening and capacitating the regional partners in implementing the Community-based Participatory Action Research (CPAR), the Bureau of Agricultural Research (BAR) conducted the first series of the "CPAR Re-orientation/Levelling-off on CPAR Concepts and Implementation for Luzon CPAR implementers" on 25-27 April 2012 at Sulo Riviera Hotel in Lucena City, Quezon.

The activity served as a refresher on CPAR concepts and implementation guidelines. Specifically, it aimed to enhance the capacity of CPAR implementers in the preparation and implementation of CPAR projects, to identify issues/concerns regarding CPAR implementation and present recommendations, and to undertake needs assessment of the CPAR project implementers for more effective CPAR implementation.

Participants were composed of researchers from the Regional Integrated Agricultural Research Centers (RIARCs) and Research Outreach Station (ROS) from all regions in Luzon including CAR, regions 1, 2, 3, 4A, 4B, and 5.

BAR Director Nicomedes P. Eleazar delivered his welcome remarks and emphasized on the importance of the re-orientation of CPAR, being one of the banner programs of BAR, as it is the basis for technology commercialization. He stressed that "we have already manifested results from CPAR projects which have shown improvements in the communities we have catered to already. And we are here to improve CPAR more so we can get better results as well."

Ms. Digna Narvacan, RIARC IVA manager, also welcomed the participants and expressed her gratitude to BAR for conducting the activity. Meanwhile, Ms. Salvacion M. Ritual, BAR's Project Monitoring and Evaluation Division head, presented the activity overview. She also presented the CPAR Process Flow and emphasized that a participatory rural appraisal (PRA) must be a prerequisite in conducting a CPAR project.

This was further reiterated by Ms. Rose Mary Aquino, a member of the BAR Technical Working Group (TWG). She stressed the importance of PRA and mentioned that "CPAR is problem-based. And such problems will demonstrate only if a PRA is done in the community. By then we can only address such problems through a CPAR project."

Dr. Roberto Rañola of the University of the Philippines Los Baños (UPLB) also a member of the BAR TWG, discussed the CPAR concepts, definitions, and dimension indicator principles. He said that "we should be giving regular orientations especially to new researchers who will engage into CPAR projects, and this activity is the start."

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PHOTO BY DBATTAD

BAR Director Nicomedes P. Eleazar (inset) reiterates to the participants the importance of conducting the CPAR re-orientation/levelling-off. Participants (right photo) from Luzon during the workshop.

DA staff attend international seminar on marine science and aquaculture

DA staff attending the seminar on marine science and aquaculture, namely (L-R): Rene Ledesma of NFRDI, Ma. Elena Garces and Ligaya Santos of BAR, and Isidro Velayo, Jr. of BFAR.

Researchers and staff members of the Department of Agriculture (DA) attended the "International Seminar on Marine Science and Aquaculture" in Kota Kinabalu, Sabah, Malaysia. Organized by the University of Malaysia Sabah (UMS), the seminar was held to provide a platform for scientist to present, discuss and share their researches, findings, and experiences. The event was in collaboration with the National Oceanography Directorate (NOD), Jabatan Pekinanan Sabah, and Kinki University.

DA staff who attended were Ligaya C. Santos and Ma. Elena M. Garces, BAR's coordinators for fisheries and aquaculture, Mr. Isidro Velayo, Jr. of the Bureau of Fisheries and Aquatic Resources (BFAR), and Mr. Rene Ledesma of the National Fisheries Research and Development Institute (NFRDI).

With the theme, *"Sustainable Development and Management Aquatic Resources in a Changing Climate"*, the three-day event was participated by almost 300 delegates with representations from the academicians, researchers, graduate students, entrepreneurs, policy makers, and other interested individuals from various countries.

Started in 2003, UMS and Kinki University of Japan initiated the seminar series dubbed as "Annual Seminar on Marine Science and Aquaculture". But with the increased number of participants, the seminar series were transformed into an international event.

Officially opening the program was the Director of Borneo Marine Research Institute of the UMS, Dr. Saleem Mustafa. He has great hopes that partnership among agencies will be sustained in the future in order to further resolve the latest issues through researches. He encouraged participants to disseminate all information to be generated from the event to all sectors of the society for implementation.

The Minister of Tourism, Culture and Environment YB Datuk Masidi Manjum served as Guest of Honor. "The natural resources are declining and solution is difficult to find. Let us all come together to resolve these problems. With in-depth analysis of issues and examining the challenges of climate change, our objectives will be achieved, outputs and deliverables will be attained", challenged the Minister.

Simultaneous oral presentations of the 78 scientific papers on aquaculture and marine sciences were actively participated with a total of 39 posters exhibited.

Topics on Aquaculture dealt on 1) Quality of Aquaculture Environment; 2) Sustainable Integrated Aquaculture; 3) Issues and Challenges in Breeding and Hybridization in Aquaculture; 4) Status of Feed and Nutrition in Aquaculture; 5) Disease and Biosecurity in Aquaculture; and 6) Aquatic Husbandry.

For Marine Science, themes were on 1) Sustainable Marine Tourism; 2) Harmful Algal Bloom; 3) Biodiversity and Conservation of Marine Resources; and 4) Impacts and Adaptation of Climate Change in the Marine Environment.

In a report by the WorldFish Center and Conservation International, it was mentioned that "aquaculture is one

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Engr. Robert G. Villa, also a member of the TWG, discussed the concept and importance of the logical framework, being one of the major requirements in submitting a CPAR proposal. It is also an essential requirement of the evaluators in reviewing and evaluating the proposals and CPAR reports.

During the workshop, participants were grouped into five, in which they were given an exercise to present their issues, concerns, and suggestions on all CPAR concepts discussed.

Director Eleazar gave important reminders in the conduct of CPAR projects including the involvement of various state universities and colleges (SUCs). He also reminded the Luzon implementers to incorporate the climate change adaptation strategies and rainfed agriculture in the R&D activities that they are about to conduct, especially in CPAR. Particularly, he emphasized on the formula: financial viability = market = technology commercialization = sustainability. (*Daryl Lou A. Battad)*

cropping, only 25 percent was organic fertilizer while the remaining 75 percent was inorganic fertilizer. The ratio of organic against the inorganic fertilizer increased as the number of cropping increased -until such time that the organic fertilizer application totally replaced the inorganic fertilizer.

The project specifically introduced the use of Bio-plus activator (BPA) and the integration of biomass such as rice straws which are readily available material in the community. Researchers from NSU-Biliran Campus capitalized on it to be used as a primary raw material for organic fertilizer formulation.

Based on the result of their study, a combination of 550 kgs of rice straw, 350 kgs of manure, 100 kgs of carbonized rice hull with 5 percent bio-plus activator (BPA) will yield on about 500 kgs of organic fertilizer or 10 bags at 50 kg per bag.

During the first year of project implementation, organic fertilizer production reached a total 21, 497 kgs in which the bulk of it is absorbed by farmer-cooperators while a total of 5,885 kgs were sold/distributed to the new adopters and other rice farmers and vegetable growers.

Reaping the benefits from CPAR

Before the implementation of CPAR project, the average rice yield was 4.3 tons per hectare. After four croppings during CPAR implementation, the yield resulted to an average of 5.08 tons per hectare. As the soil is still regaining its fertility, the yield increase is still not on its peak. Nonetheless, the slight increases in yield still have a big contribution on their profit.

"Dati ay malaki-laki din naman ang aming ani pero ang gastos ay malaki din. Ngayon, hindi na malaki ang gastos sa abono pero ang ani namin ay nadadagdagan" (Before we also have good harvest but the expenses are also high. Now, our expenses for fertilizer is minimized but our harvest continues to increase), narrated by Ms. Cecilia Palconit, a farmer cooperator.

Another observation of the farmers during the project implementation, the grains are fully filled compared before in which the grains are smaller and thinner. There is also higher milling recovery. Before, they can recovered 8-9 gantas (1 ganta = 2.25 kgs), and during CPAR it now reached 10-11 gantas.

PHOTO FROM DA-EVIARC

Moreover, the farmer cooperators are selling their harvest in a much higher price. Before, they sold it by Php10.00 per kg. Now, they are selling it by Php 14.00 per kg.

Another notable benefit of CPAR project in these two barangays was that the practice of burning the rice straws was totally eradicated. The former practice of the farmers was the unrestrained burning of rice straws every harvest time.

With Ms. Gayrama's guidance and teachings, she was able to convince the farmers to stop this practice and instead, use the rice straws as substrates in organic fertilizer application. *"Hindi na kami nagsusunog ng rice straws. Lahat ng dayami ay iniipon na namin para magamit sa organic fertilizer. Kahit wala kang pera, pwede kang gumawa ng organic (fertilizer) naiaapply mo sa rice fields mo,"* (We do not burn rice straws. We gather them and use as organic fertilizer. Though we don't have money, you can produce your own organic fertilizer that you will apply in your rice fields) narrated by Brgy. Captain of Hugpa Alejandro Corpin, also a farmer cooperator.

Ms. Gayrama shared that the project is experiencing the downside of the farmers seeing the benefits of using rice straws. They now have difficulty of sourcing out rice straws for the production of organic fertilizer. People are now using it in their own farms by just spreading it to their tilled rice farms. They are looking for alternative biomass in case there would be scarcity for rice straws.

She also reported that they have already 11 adopters and there are still farmers who are voicing their interest in adopting the technologies. "The farmers have this 'wait-and-see' attitude. They are going to observe and if they saw it is good, they will follow" Ms. Gayrama added.

As the project is nearing its completion this December 2012, the CPAR team hopes that the farmers will able to sustain what they have started.

There are lots of available matured technologies in the country on which if adopted properly and be given to the smallholder farmers can contribute a lot for increased rice productivity and at the same time helping in increasing farmers' profitability. ###

This article is based on a BAR-funded project titled "CPAR on Organic Fertilizer Production and Utilization for Enhanced Organic Rice Productivity" being implemented by the Eastern Visayas Integrated Agricultural Research Center (EVIARC), DA-RFU VIII, Tacloban City and Naval State University – Biliran Campus.

PHOTO FROM DA-EVIARC

Organic fertilizer from rice straw made easy through CPAR

BY DIANA ROSE DE LEON

Rice farming is crucial in ensuring that the country is always food sufficient. A rice-loving country as the Philippines, it ranks 6th among the top 10 rice-consuming countries in the world and 8th among the top 10 rice producing countries. The irony of it is that the country also bagged the top spot on having the largest rice importation in the world.

As the gap between the supply and demand of rice becomes wider, the government is looking for ways to increase rice productivity in the country. One of which is through technological interventions.

Coming into the picture is the Bureau of Agricultural Research's (BAR) banner program, the Community-based Participatory Action Research (CPAR) which focuses on technology adoption and transfer. It aims to provide options for farmers to choose which technological interventions are most appropriate to their farm setting and needs.

The Eastern Visayas Integrated Agricultural Research Center (EVIARC), Department of Agriculture-Regional Field Unit (DA-RFU) 8, puts CPAR in practice in an island province located in Eastern Visayas.

Shifting to organic farming

Biliran is the 4th smallest province in the Philippines. With its mountainous terrains and immense plains surrounded by waters, it is suitable for various sort of agricultural activities especially in rice cultivation.

Rice is the champion crop in Biliran, Biliran especially in the two identified CPAR project sites, brgys. Hugpa and Canila. In these two barangays alone, a total of 220 hectares or 94 percent of the cultivated areas are lowland irrigated used for rice production. Nonetheless, the farmers could not maximize the full benefits of its profitability due to their conventional farming practices which result to low yield, lack of appropriate technological interventions, and the incessant fluctuation of prices of farm inputs especially the chemical-based or inorganic fertilizers.

Through a series of consultations, it was later identified that the best solution is shifting into organic rice farming. “We chose to introduce organic farming to the farmers as the prices of chemical-based fertilizers are too expensive; reaping of what's left to the farmers' pocket” said by Ms. Vilma Gayrama, project leader and a researcher in Naval State University (NSU).

She reported that the price of a sack of inorganic fertilizer cost more than Php 1,000 and normally, a farmer with a hectare of rice land would require 6-10 bags of inorganic fertilizers. By shifting into the application of organic fertilizer, farmers would spend less on cost of inputs due if purchase, it is priced at Php 400 per sack. As the project's objective is to help the farmers to produce their own organic fertilizer by utilizing the waste materials in their area, the farmers can have his/her own production area, thus, saving in production cost.

For the project, 12.5 hectares are devoted to the CPAR in which 25 farmer-cooperators from Hugpa Small Farmers Association and Canila Agrarian Reform Multi-purpose Cooperative were tapped.

Organic fertilizer from rice straws

The project aims is to slowly shift the practice of Biliran rice farmers to organic rice farming. “For now, we are not yet into full organic because we do not want the farmers to experience a sudden and drastic drop on rice yield. If we shift immediately to organic without certain soil conditioning, there is surely a bad harvest. We have to take it slow.” narrated by Ms. Gayrama.

The CPAR team strategized on fertilizer application. During their first

WESMIARC renamed ZAMPIARC

The Western Mindanao Integrated Agricultural Research Center (WESMIARC) has been officially renamed the Zamboanga Peninsula Integrated Agricultural Research Center (ZAMPIARC) by the Department of Agriculture (DA) in accordance with Administrative Orders no. 6 and 19, series of 1991, with the national identity of Region IX as Zamboanga Peninsula.

ZAMPIARC is mandated to conduct basic functions of Research, Development and Extension, which includes training and technical assistance in Region IX. Under this center are six Research Outreach Stations (ROSes) aimed at crops, livestock, and fisheries, with four major sections: Crops and Soils Systems Section, Animal System Section, Farm Operation and Production Section, and Technical Assistance Section.

The rationalization stems from problems encountered with the past set-up, as stated in the position paper published by the DA-Regional Field Unit IX. Among the issues discussed are difficulties in maintaining the center's existing projects and facilities. Along with budget constraints in livestock stations and the likes, funds that support the stations are no longer enough to sustain the operation. It is due to this that income-generating projects for every station were encouraged in hopes of adding to the funds that could support some of each respective station's activities. However, there are of course still procedures to be followed.

Given this, the aforementioned ROSes and satellite stations were deemed to have to be streamlined and focused to at least three commodity specializations in order to manage the agency's scarce resources.

Out of six ROSes and six satellite stations, rationalization has brought a reorganization of the clustered stations, along with its corresponding locations and priority commodity assignments.

A number of three clusters have been retained, but with each cluster there is an assigned Research and Development Station (RDS), and under each RDS are the remaining stations, thus converted to Agribusiness Development Areas (ADAs).

The responsibilities of an RDS include formulating research proposals on technology adaptation, verification, dissemination, and information generation for on-station and on-farm research activities. Furthermore, responsibilities for an RDS also include conducting research activities, providing technical assistance to LGUs and stakeholders, as well as establishing research, development, and extension linkaging.

On the other hand, an ADA is tasked with preparing proposals on production aspects; its activities should be geared towards income-generation and technology demonstration/ commercialization. ADAs can also serve as the experimental sites for conducting approved proposals of the cluster, providing technical assistance to LGUs and stakeholders, and last but not least, developing the agribusiness acumen of the station.

With these changes comes the hope that the foundations upon which the center was originally built for shall be strengthened, along with its programs and activities in order to further the mandate by which WESMIARC, now ZAMPIARC, exists. *(Maria Anna A. Gumapac)*

“With these changes comes the hope that the foundations upon which the center was originally built for shall be strengthened, along with its programs and activities in order to further the mandate by which WESMIARC, now ZAMPIARC, exists.

BAR, SEARCA hold 1st batch of training workshop on KM

Participants of the "BAR-SEARCA Training Workshop on Knowledge Management" with SEARCA Project Development and Management Dept. Manager Bessie M. Burgos (fourth from right, front row) and Information and Communication Studies Professor and KM Expert Alexander G. Flor (fourth from right, back row)

People empowerment is one of the best practices which enable an organization to achieve success. As one of its components, capacity building equips people with information, knowledge and first-hand experiences to be able to work productively and efficiently.

With this, the Bureau of Agricultural Research (BAR), in partnership with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), held the first batch of training workshop on knowledge management (KM) capacity building on 26-27 April 2012 at Drilon Hall, SEARCA, Los Baños, Laguna.

It was participated in by information officers, researchers, and technical staffs from the Luzon and Visayas clusters representing various research-implementing institutions, agencies, and bureaus of the Department of Agriculture (DA) including BAR, Bureau of Fisheries and Aquatic Resources (BFAR), Bureau of Animal Industry (BAI), Bureau of Plant Industry (BPI), Bureau of Soils and Water Management (BSWM), Cotton Development Authority (CODA), Fiber Industry Development Authority (FIDA), Philippine Rice Research Institute (PhilRice), Philippine Coconut Authority (PCA) and Philippine Center for Postharvest Development and Mechanization (PhilMech). It also provided a venue for the participants to share their current practices on information and knowledge management (IKM) and their capacity development requirements which were assessed through training needs analysis.

Generally, the activity served as a leveling off on the concept, tools and processes involved with IKM and a supplementary activity for the BAR-SEARCA joint project titled, "Capacity Development Program on Knowledge Management". This project aims to improve the capacities of the participants to be able to manage the knowledge that they acquire through various R&D projects and properly disseminate them to concerned stakeholders to further enhance the agriculture and fisheries sectors.

Dr. Alexander G. Flor, professor of Information and Communication Studies at the University of the Philippines - Open University (UPOU) and a knowledge management expert, served as the resource speaker for the event. The first day was divided into three sessions – with the first two focused on lectures given by Dr. Flor. The first lecture was all about the concept of KM and its goal of knowledge capture, sharing, and reuse. The second lecture presented the issues concerning agriculture and fisheries on a global scale and how information and communication can address them. The third session was dedicated on case studies to further illustrate and give concrete examples of agriculture and fisheries IKM practices of selected institutions.

The first case, presented by SEARCA's Dr. Mariliza Ticsay and Ms. Angela Mae Minas, was their very own Knowledge Center on Climate Change or KC3. As the name implies, it is a venue committed to facilitate knowledge sharing on climate change and other related issues. During cases 2 and 3, the participants traveled from SEARCA to the International Rice Research Institute (IRRI) where they were introduced to the Riceworld Interpretive Center, a form of knowledge fair. With the assistance from Mr. Paul Benjamin Hilario, the museum's curator, the participants were given facts and figures about rice all over the world through exhibits and displays. Ms. Maria Eda Apple Suplido, a researcher from IRRI, presented the last case study about a mobile application which they developed to help farmers and extension workers on field specific nutrient management.

Ms. Julia A. Lapitan, head of BAR's Applied Communications

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PHOTOS BY RDELACRUZ

Sapinit juice and wine have already been introduced in the market. As of this writing, one bottle of a 375 ml juice is worth P65.00, a 350 ml bottle of wine costs P150.00, and a 700 ml wine is priced at P300.

However, there is still a need to strengthen the establishment of the pilot production farms. Expansion areas were established, hence more planting materials are needed to be produced. Areas in Dolores and Quezon where vermicomposting facilities will be set up have also been identified. They also employ intercropping in plantation farms where *sapinit* are being planted with other crops including raddish and passion fruit. Additional areas for *sapinit* production and other processing areas, vermicomposting facilities, trainings, product processing and marketing are the components that the project still has to accomplish.

Resolving identified setbacks

In every project, problems are inevitable. Pests are known to be inhibitors of a bountiful harvest of agricultural crops. Notably, during one of the monitoring activities done by BAR, Ms. Averion said that the *sapinit* crops were not infested nor damaged by pests.

However, while *sapinit* exhibited potentials like this, there are still setbacks which should be addressed including seasonality and short shelf life. *Sapinit* can be considered fresh for only two to four days. To address these problems, QAES technical personnel look into the possibility of processing the crop into food products such as juice and wine, among others.

Development into liquid food products

Water makes up a large part of our body composition. Water, together with other sources of liquid, can keep our bodies hydrated. While juice provides a sweet taste in our tongues, studies have shown that moderate drinking of wine can benefit the heart and other parts of the body as well. Juice and wine are only two of the many products which can be made out of *sapinit*.

Sapinit juice and wine have already been introduced in the market. As of this writing, one bottle of a 375 ml juice is worth P65.00, a 350 ml bottle of wine costs P150.00, and a 700 ml wine is priced at P300. With its introduction in the market, a number of people are now visiting QAES to purchase such products. However, identification and development of market linkages are still in progress.

There are still things that should be done to be able to fully realize the success of the commercialization of *sapinit* production, backed up by the unswerving dedication and concerted efforts of the project proponents, beneficiaries and stakeholders. With commercialization, *sapinit* production will open more opportunities and help sustain the livelihoods for the farmers and households in the province of Quezon. With the continued support from various institutions, *sapinit* products may become available not only in Quezon, not only in the Philippines, but also in other parts of the world. ###

This article is based on the project titled "Commercialization of Sapinit (Rubus rosifolius Linn.) Production in Quezon Province".

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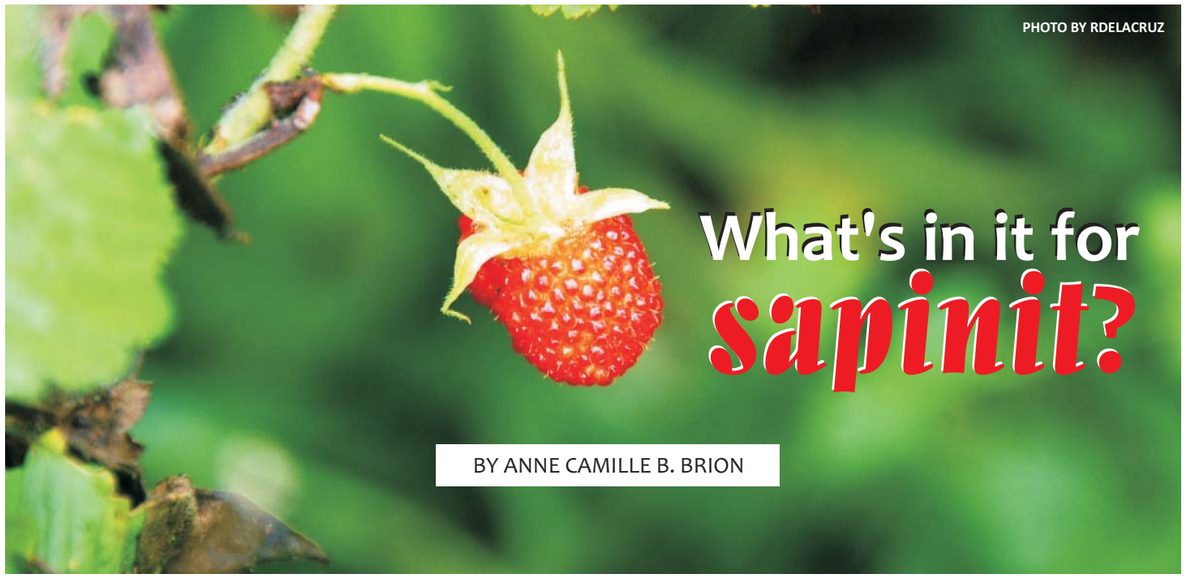

BY ANNE CAMILLE B. BRION

Agriculture is one of the main components responsible for a country's food security. With the growing population, an increase in food demand would also be expected.

In 2011, the agricultural sector of the Philippines grew by 2.34 percent, according to the Bureau of Agricultural Statistics (BAS). Development projects and initiatives should be given attention, focus and priority for a more improved and enhanced agricultural productivity. However, in a world where profits play a major role for man to survive, it is essential that production be upgraded to commercialization to provide more income for farmers, entrepreneurs, and even households.

Reaching out to the market

With its fertile lands and suitable topography, the province of Quezon is one of the places in the country where agricultural activities continuously blossom. Known as the country's leader in coconut production, it also shares with Laguna the location for one of the famous mountains in the Philippines – Mount Banahaw. Not known by many, a wild crop is endemic in this mountain and is now on its way of becoming a popular crop in the town.

Sapinit (*Rubus rosifolius* Linn.), also known as Philippine wild raspberry, belongs to the *Rosaceae* or rose family due to its prickly stem. It has been tested for food production and is found to be beneficial to the human body with its high antioxidant properties and many more. Hence, a two-year project titled, "Commercialization of *Sapinit* Production in Quezon Province" was undertaken by the Department of Agriculture-Quezon Agricultural Experiment Station (DA-QAES) in collaboration with the Rural Improvement Club (RIC) and Local Government Unit (LGU) of Dolores, Quezon.

Sapinit (*Rubus rosifolius* Linn.), also known as Philippine wild raspberry, belongs to the *Rosaceae* or rose family due to its prickly stem. It has been tested for food production and is found to be beneficial to the human body with its high antioxidant properties and many more.

The project specifically targets the 1) establishment of pilot production farms in Dolores, Sariaya and Lucban, Quezon, 2) assistance to be given to three cooperatives or farmers' organizations who are also project beneficiaries, and 3) identification and development of market linkages for the products.

From the "*Sapinit* Production and Utilization Project" funded by the Bureau of Agricultural Research (BAR), a Package of Technology (POT) for *sapinit* was created. This will be used in this project to provide information on sapinit production and processing management as well as standard procedures for product development. The developed POT resulted in an increase in productivity and enabled the upgrading of the production of *sapinit* to commercialization.

According to one of the project proponents Ms. Lani Averion, they are already in the process of product development such as juice and wine.

42nd CSSP conference concludes;

BAR-supported corn project wins best paper

Dr. Romeo V. Labios (2nd from right) of the Agricultural Systems Cluster-University of the Philippines Los Baños (ASC-UPLB) receiving the Best Paper Award (downstream research category) for the BAR-funded project titled, "Participatory Varietal Selection of White Corn as Alternative Staple Food" given during the 42nd CSSP Scientific Conference. PHOTO BY LPADILLA

To improve agricultural income and productivity through development and transfer of suitable crop science technologies to our farmers, the Crop Science Society of the Philippines (CSSP) concluded its 42nd Scientific Conference on 16-21 April 2012 in Puerto Princesa City, Palawan. Sponsoring the event was the Bureau of Agricultural Research (BAR) with this year's theme, "Linking Crop Science Technology and Farmers toward Sustainable Agricultural Productivity".

Dr. Leoncia L. Tandang, CSSP president, officially opened the conference while Dr. Teodoro S. Solsoloy, in behalf of DA Secretary Proceso J. Alcala, delivered an inspirational message. Dr. Solsoloy presented "*The Role of DA-BAR in Bringing Technology Closer to the People"*which emphasized the transactional and transformational nature of the bureau's agenda as a funding and monitoring agency for R&D in agri-fisheries sector. It highlighted the BAR's two banner programs: Community-based Participatory Action Research (CPAR) and National Technology Commercialization Program (NTCP).

Dr. William D. Dar, director general of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) served as honored guest and keynote speaker. In his speech, he mentioned climate change, land degradation, loss of biodiversity, food crisis, energy crisis, and population explosion as among the challenges that the country continues to face today. A way to mitigate the occurrence and to reduce the impacts of these problems is through intensifying research, development, and extension (RDE) in crop science, he said.

"A challenge to crop scientists is to generate and deliver crop science technologies for smallholder farmers to improve productivity, income and well-being of farming communities," Dr. Dar stressed.

One of the highlights of the conference was the presentation of various awards. Dr. Romeo V. Labios of the Agricultural Systems Cluster-University of the Philippines Los Baños (ASC-UPLB) received the award for Best Paper for the project, "Participatory Varietal Selection of White Corn as Alternative Staple Food" which won under the downstream research category.

This research, which is supported and funded by BAR, aims to address food security and nutrition through providing farmers in selected municipalities in Bohol, Quezon, and North Cotabato with suitable white corn varieties.

ICRISAT Director General William D. Dar delivering his keynote address. PHOTO BY LPADILLA

Another awardee, Dr. Heraldo L. Layaoen, Mariano Marcos State University (MMSU) vice president for administration, planning and external linkages, was presented the "2012 CSSP Honorary Fellow Award" for his valuable contributions as national program leader on sweet sorghum research, development, and extension (RDE) spanning a period of seven years.

Dr. Layaoen expressed his deep gratitude to CSSP, MMSU, and all the institutions that continue to support his RDE endeavors. Most of the RDE activities on sweet sorghum undertaken by Dr. Layaoen were supported by BAR. Among these were focused on sweet sorghum production and processing as food, feedstock, fuel, and fertilizer.

The event was participated in by CSSP officials and members, evaluators, participants, sponsors, and honored guests from various agencies and institutions, including BAR, Philippine Rice Research Institute (PhilRice), International Rice Research Institute (IRRI), ICRISAT, Palawan State University (PSU), Western Philippines University (WPU), Puerto Princesa City Local Government, Palawan Provincial Government, and Monsanto Philippines.

CSSP is an agro-based professional society that aims to advance crop productivity in the Philippines through research and development. BAR has been providing support to CSSP knowing that it is a platform for knowledge sharing on new technologies which can enhance crop productivity in the country. *(Leila Denisse E. Padilla)*

Organic farming progresses in Bangkong Kahoy

HARVESTING OF ORGANICALLY-GROWN CABBAGE. BAR-TCD staff, Ms. Evelyn Juanillo (left) and Mr. Alvin Fontanil (right) with experts from UPLB led by Dr. Portia Lapitan (4th from left) of UPLB during the project site monitoring and evaluation of the BAR-funded project, "Sama-samang Pagsasaka sa Organikong Pamamaraan"in Bangkong Kahoy, Dolores, Quezon. PHOTO BY RDELACRUZ

While inorganic farming has its share of negative impacts, organic farming continues to flourish with its promising outputs such as high-quality and chemical-free agricultural crops. It requires low production inputs and promotes environmental protection, but most importantly, it safeguards the well-being of the people.

"Ang gulay sa Dolores, Quezon ay walang lason." This tagline is what gives the farmers of Sitio Bangkong Kahoy, Brgy. Kinabuhayan in Dolores, Quezon a reason to be proud of their vegetable produce.

In support of the Department of Agriculture's goal of pushing organic agriculture in the Philippines through Organic Agriculture Act of 2010, a project titled, "*Sama-Samang Pagsasaka sa Organikong Pamamaraan*" is being implemented. It is a community-based organic farming/agroforestry project led by the Center for Environmental Law and Policy Advocacy, Inc. (CELPA Inc.), with funding support from the Bureau of Agricultural Research (BAR), in cooperation with the local government unit of Dolores, Quezon, Bangkong Kahoy Farmers' Organization for Reforestation and EcoSystems Trust (BK FOREST) that also served as the intended beneficiaries of the project, and with support from Costales Nature Farm in Majayjay, Laguna.

The project aimed to familiarize and educate the farmers on organic farming implementation, teach them the processes involved in organic fertilizers and pesticides production, register an increase in farmers' income and establish a market for the produce.

As part of the project monitoring activities, a group composed of BAR, CELPA, and University of the Philippines Los Baños (UPLB) visited the sites and met with the farmer cooperators. This meeting also served as a venue for the partner institutions and stakeholders to impart their messages for the project's accomplishments.

Mr. Dionisio "Dion" Pullan, vice president of BK FOREST, talked about the importance of organic farming in the lives of the people residing in Bangkong Kahoy. According to him, the use of inorganic pesticides contributes greatly to the suffrage of the water table, which then poses health threats to their fellow in the lowland. Being an environmentalist himself, Mr. Pullan encouraged other farmers to engage in producing vegetables organically and avoid the use of inorganic pesticides in farming to preserve the balance in the ecosystem. By refraining from using harmful chemicals, vegetables can be eaten fresh right after harvest. He added that the easy-to-prepare pesticides created for organic farming do not actually kill pests, instead pests are just prevented to get near the crops. He furthered that "if organic farming will be sustained, people of Dolores will be able to send their children to colleges or universities". He also expressed his gratitude, especially to BAR, for

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compared with Spadefish (where first already involves genetic manipulation technologies, and the latter with just merely scratching the surface).

In 2011, aquaculture grew by 4.96 percent as a result of continued research and development (R&D) initiatives aimed at increasing yield. R&D resulted to more advanced brackish-water fishpond production in Rizal, renewed pond management techniques in Antique, and favorable mudcrab yield in Zamboanga—just among the many contributions in the development of the Philippine aquaculture industry.

R&D initiatives by the Department of Agriculture (DA) and its attached agencies such as the Bureau of Fisheries and Aquatic Resources (BFAR) and the Bureau of Agricultural Research (BAR) together with Regional Field Units (RFU) and the private sector continue to enhance technologies that would better our industry and forward fish production in the country.

BAR for instance continues on with a couple of aquaculture projects involving Regional Fisheries R&D Centers (RFRDCs) under its banner programs, Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP), implemented throughout the country. Among these involve high-value finfishes, giant tiger prawns, and mudcrabs projects for CPAR, and Tamban and Dilis projects for NTCP.

Profitable aquaculture through sustainable practices

To stage the important role of aquaculture in the Philippines and to showcase new technologies for the development of this industry, the " 3rd Aquaculture Expo and Convention Philippines" was held on 18–20 April 2012 in Angeles City, Pampanga. With the theme, "Profitable Aquaculture: Supporting Sustainable Practices," the event was sponsored by B-MEG Aquatic Feeds, TATEH Aqua Feeds and BAR. The three-day event was attended by various stakeholders in the aquaculture industry sharing and discussing on the current issues and concerns to strengthen and improve the sector.

Participants of the event included representatives from the sponsors and organizing partners like ASA International Marketing, the Southeast Asian Fisheries Development Center (SEAFDEC) – Aquaculture Department (AQD), World Aquaculture Society – Asia Pacific Chapter (WAS-APC), as well as exhibitors from both the private and public sectors.

A continued collaboration among the WorldFish Center, BAR and BFAR, Aquatech aims to provide awareness of aquaculture commercialization and to promote technology developments. The event included an exhibit area and scheduled presentations and seminars by specialists in the field of aquaculture.

Presentations varied, from a report on the status of Philippine aquaculture by Dr. Joebert D. Toledo, chief of SEAFDEC- AQD, to new technologies available to date in the Philippine market. BFAR Director Asis Perez also graced the opening ceremonies and shared a brief but noteworthy speech, stressing the importance of aquaculture in the country.

"We have still yet to find what it means to become a sustainable aquaculture country," stresses Director Perez.

Way back when fish was abundant in the country, the need for developing tools to gather and preserve fish products was unnecessary because of the overflowing supply. But during this time when population continues to grow and the demand for fish increases exactly when fish supply is almost depleted, sustainable aquaculture becomes a solution to meeting the fish demand of the country to date, and for generations to come.

Challenges concerning both supply and demand for fish products continue to rise. However with initiatives such as this and the continued commitment of industry participants, we are given the chance to strengthen the Philippine aquaculture industry and finally achieve sustainable aquaculture for our country. ###

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Aquaculture species: (Clockwise) King crab, grouper, tilapia PHOTOS BY ZREYNOSO

Making Phl aquaculture sustainable

BY ZUELLEN B. REYNOSO

PHOTOS BY ZREYNOSO

The continued growth in world population indicates a heavier burden on our natural resources. The ability of a country to sustain its people and provide food depends not only on the farmers and fisherfolk, but also on the productivity of both the land and sea. Tireless crop rotation and overfishing continue to plague countries—making soil and seas barren—and posing a real threat to attaining food sufficiency. Although farming practices—from seedling development to postharvest techniques—have grown in popularity worldwide, progress in aquaculture falls a few steps behind. With three-fourths of the Earth's natural resources laying scattered on the seas, untouched, further developments in aquaculture could be the answer to food scarcity in a globalized society.

Aquaculture is the process of farming aquatic organisms. Salt- and freshwater fish, plants, mollusks, and crustaceans are among the harvested products in aquaculture. The entire process is aimed to overcome issues that are related to uncontrolled conditions brought about by changes in salt- and freshwater such as salinity, weather changes, and even the effects of climate change. The difference between aquaculture and commercial fishing falls mainly on the harvested products as the latter yields wild species of aquatic organisms that directly affect its marketability in terms of quality and quantity.

It was only until the 1990s that aquaculture came into the forefront of fish production in the Asia-Pacific region, and in the Philippines.

In an archipelago of approximately 7,100 islands, the country was abundant in seafood supply. However, over fishing and the growing population have led to the insufficient supply of fish and other sea food products, which in turn slowly gave birth to the Philippine aquaculture industry.

Aquaculture in the Philippines today

Among the many fish species farmed in the country, milkfish is known to be one of the earliest to be cultivated, and even paved the way to the farming of other species for food consumption. Carps and other freshwater fish species, oysters and mussels, shrimp species, prawns, crabs, seaweeds, and other fish such as tilapia, seabass, groupers are among the many products that are now being cultivated in salt- and freshwater pens, cages, and ponds around the country. And as diverse as these species are, the development of the industry is varied—it differs from one species to another like the case of Tilapia

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> ***With three-fourths of the Earth's natural resources laying scattered on the seas, untouched, further developments in aquaculture could be the answer to food scarcity in a globalized society.***

BAR holds seminar on aquaponics technology

RFRDC Manager Lois June B. Fermin (left) of BFAR-CAR serves as the resource speaker while Mr. Danilo Agliam (right) of DA-CAR provides a brief demonstration on aquaponics technology. PHOTOS BY ABRION

Pursuant to its task to conduct activities that will help disseminate information and knowledge generated from R&D project results and are relevant to the agricultural and fisheries sectors, the Bureau of Agricultural Research (BAR) held a seminar on Aquaponics Technology on 19 April 2012 at 4/F BAR Conference Room, Visayas Avenue, Diliman, Quezon City.

Lois June B. Fermin, manager of the Regional Fisheries Research and Development Center (RFRDC), Bureau of Fisheries and Aquatic Resources – Cordillera Administrative Region (BFAR-CAR), served as the speaker.

While aquaculture is simply defined as the farming of aquatic animals, hydroponics means soil-less crop farming. A combination of these two into one system operating in a symbiotic environment is called "aquaponics". In this technology, fish wastes acquired from the aquaculture are used as nutrients for growing crops under the hydroponics component. Consequently, the water from the fish tank is cleansed through the plants.

Among the crops that can be grown through this technology are strawberries, lettuce, *pechay*, and other leafy vegetables which are fast-growing. Meanwhile, *tilapia* and freshwater prawns can be grown under the aquaculture component. Though catfish and carps may also be included, they are slow-growing. It is the choice of the raiser as to what kinds of plant and types of fishes to grow. However, producing such resources may vary depending on the environmental conditions of a place. For example, Japanese eels which can thrive under CAR, may not be suitable with Manila's temperature.

Joining Manager Fermin was Mr. Danilo Agliam of DA-CAR, who is also an aquaponics practioner. He proudly shared his experiences in implementing aquaponics in the premises of his own home. Without machines and using only styrofoam with equally-spaced holes, he was able to successfully plant crops and grow fishes. According to him, what's important is that this technology provides food for families and urban dwellers while protecting and preserving the environment.

"Increasing population, food shortages especially in the urban areas, and global warming are among the many challenges we face nowadays. Aquaponics may just be the weapon we need to combat these crises," emphasized Fermin. She added, "it requires no pesticides, thereby ensuring food safety. Aside from being highly nutritious, fruits and vegetables produced under the technology taste sweet, that my kids, who normally do not eat vegetables sold from the market, now eat these kinds of vegetables."

She added that, aquaponics is also very easy to operate and requires low maintenance, since there is no need to weed, water and cultivate soil. It also addresses the issue on climate change through water conservation and the promise of having no leaching of nutrients or waste into the environment. However, Fermin reminded those interested adopters that "before trying this technology, one still has to be equipped with the right knowledge and skills to be able to effectively manage the farming of crops and fishes."

This technology is still at its infancy stage. Further studies and support from various institutions are still needed to realize its full potential. *(Anne Camille B. Brion)*

For inquiries regarding the aquaponics technology, you may contact:
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Aquaponics technology was featured in the BFAR-CAR booth during the 2011 A/F National Tech Forum held at SM Megamall. PHOTO BY RDELACRUZ

Protecting future crop the urban agriculture way

BY PATRICK RAYMUND A. LESACA


Dr. Renato C. Mabesa of UPLB

PHOTOS BY RBERNARDO UPLB/RMABESA

Now we can practically grow any crop under protective structures," hence the statement of Dr. Renato C. Mabesa in a seminar on protective cultivation technology conducted by the Bureau of Agricultural Research (BAR) on 19 April 2012 at 4/F BAR Conference Room, Visayas Avenue, Diliman, Quezon City.

The presentation of Dr. Mabesa centered on the concepts of urban agriculture, a cultural and farming management practices designed primarily to produce food and to protect such crops against environmental hazards like excessive rain and extreme heat.

Dr. Mabesa explained that urban agriculture, also called protective structure, is being done in selected parts of the country to show that one can practically grow any crop under said protective cultivation practices in limited or small open spaces. It takes a minimum of only 10-square meter to set up the said structure.

The urban agriculture concept

Urban agriculture stemmed from the idea that the country's population is undeniably fast increasing. According to the census made by the National Statistics Coordination Board (NSCB), the country's population reached 92 million in 2010 and is projected to increase by 141 million by 2015. The Philippines is also the 12th most densely populated country with an estimated 49 percent living in urban areas. Studies further revealed that after 25 more years, it is predicted that urban dwellers will reach 65 percent. Dr. Mabesa cited report from the United Nations (UN) saying that in 2050, half or 50 percent of the current arable land will become unusable due to land degradation and our world population is expected to rise to 9 billion. The total arable area in the country is decreasing. This perhaps could be attributed to massive industrialization which is eating some of the country's agricultural lands.

Given these facts, the challenge to feed the country's multitude is imperative. Dr. Mabesa articulated that the lack of land area could be addressed through container growing. The use of protective structures will help increase production of selected high-value vegetables and other crops all year round given the proper management and discipline.

With these compounding situations, the opportunity to venture into an alternative farming practices is being forwarded. This led to the implementation of a project titled, "Promotion and Commercialization of Using Protective Structures for High-Value Vegetable Production in Containers in Urban Areas". Leading the implementation of this project is Dr. Renato C. Mabesa of the Crop Science Cluster, College of Agriculture of the University of the Philippines Los Baños (UPLB). This initiative is funded by the Department of Agriculture - High Value Crops Development Program (DA-HVCDP) and the Bureau of Agricultural Research (BAR).

Specific to this undertaking is to promote the use of protective structures, demonstrate the growth and yield performance of high-value vegetable crops in container under different protective structures and broaden the knowledge and skills of potential adopters on container gardening under protective cultivation.

The first phase of the project demonstrated the production of different kinds of vegetable salads, particularly lettuce in containers under protective structures. This was done in selected areas in the provinces of Cavite, Laguna, Batangas, Rizal and Quezon (CALABARZON). The structures were also built in Metro Manila and in particular in the vicinity of BAR in Quezon City. Phase Two of the project studied the performance of various *Brassicas* (also called *Cruciferae*) such as cabbage, cauliflower, broccoli, and kale again in Metro Manila and in CALABARZON.

The project is now on its third phase focusing on the performance of *"pinakbet"* crops such as tomato, eggplant, lady's finger, string beans, bitter gourd, and squash. Results from the first two phases have been incorporated in the third phase particularly the use of protective structures and containers.

For the protective structures, Dr. Mabesa reported that they have used steel bars and flat irons to form the metal frame; polyethylene sheet to protect the plants against excessive rain during the wet season; fine nylon net to cover the same against intense sunlight during dry season and restraining twine and plastic pots.

The third phase of the project concentrates on non-governmental organizations including the Gawad Kalinga, Gulayan ng Masa proponent in Laguna, Bahay ni Juan, ABS-CBN Foundation, Villa Banzuela Urban Housing, UPLB Vegetable Crops Division as well as other informal settlers. The proponents of the projects are also being tapped by the local government and barangay officials for possible set-ups.

"We need to teach them the technology of making available home-produced food and be able to sell them through informal markets thus providing them an additional source of income" said Dr. Mabesa. He added that, the technology is very simple and affordable and the materials are readily available. "If you have a small area within your proximity, this is very easy to set it up," concluded Dr. Mabesa.

The initial cost to set-up the entire protective structure on a 10 sq.m. is P10,000 - P12,000 per structure. The return analysis based on initial estimates showed that for both dry and wet season of *pinakbet* vegetables, the return on investment is 24 percent. ###

Organic farming...from page 8


A store that sells organically grown produce serves as the market outlet for the farmer-members of the BK FOREST in Dolores, Quezon.


PHOTOS BY RDELACRUZ

fulfilling its promise of supporting the implementation of organic farming in Bangkong Kahoy.

Ms. Evelyn Juanillo of BAR's Technology Commercialization Division (TCD) gave a message in behalf of BAR Director Nicomedes P. Eleazar. She thanked everyone for their efforts and mentioned that BAR never forgets its promise in support to the project, especially that while it helps uplift the lives of farmers, it also aids in conserving the environment.

Also in attendance was Municipal Agriculturist Anniewenda Reyes, noting that Dolores, Quezon has one of the best fertile lands making it very suitable for farming agricultural crops. She also cited the 20 percent increase in development fund given to them by the LGU in support to organic agriculture. While organic farming takes a little time, she reiterated that farmers' teamwork and patience will result in the continuous success of the project. Meanwhile, farming alternatives such as phasing and crop rotation are being done to address such problem.

Another notable progress of the project is that as soon as paper works are finally settled, BK FOREST will now be officially registered in the Securities and Exchange Commission, enabling them to venture into vegetable enterprises.

Others who also participated in the activity were Dr. Ramon Razal, former dean of UPLB- College of Forestry, Dr. Portia Lapitan, professor from UPLB and co-team leader of the project, Councilor Marife "Pepay" Mendoza, and the members of BK FOREST.

The group visited the various project sites in Bangkong Kahoy to check and monitor the status of the different organically- produced vegetables including lettuce, cabbage, cucumber, raddish, among others. *(Anne Camille B. Brion)*