



## Reaping fruits of Davao's off-season mangosteen

One year after the project's completion, the off-season mangosteen (*Garcinia mangostana* Linn.) production and management technology developed by the Department of Agriculture (DA)-Davao Region continuously provides high yield to farmer-adopters in the region.

Funded and supported by the DA-Bureau of Agricultural Research (BAR), the technology was made possible through the project "Development of Package of Technologies for Off-Season Production of Mangosteen" under the High Value Crops Development Program.

The four-year project has yielded favorable results after it was

experimentally conducted at the Davao Agricultural Research Central Experiment Station (DARCES) in Manambulan, Tugbok District, Davao City from 2015-2019.

The success was achieved through devising protocols that induce the flowering process of mangosteen—a crucial process in its fruit production.

Alfredo Mier, 38, was one of the first farmer-adopters of the said technology. A member of Katigan Gawad Kalinga Cooperative, he manages a farm in Toril, Davao City where he owns three 12-year old mangosteen trees which have fruited only twice since they were planted, and produced only an overall average of nine kilograms on a normal season

from August to September.

Mier is a regular producer of cacao and banana as his source of income. But upon discovering the technology, he decided to intercrop mangosteen with cacao and banana and adopted the technology introduced by DARCES.

Following the recommended protocols, and the establishment and utilization of rain shelter which controls the microclimate of the tree and manipulates fruit bearing, his first trial of the technology has yielded 24 kilograms of mangosteen—almost thrice the normal volume of produce, as harvested on April 2020.

Furthermore, Mier's mangosteen produce was sold in Php 100/kg,

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Rain shelters are installed over mangosteen trees to induce flowering. PHOTOS: RDELACRUZ

# AMIA project paves the way to sufficient food for farmers, villagers amid crisis



The farmers and villagers of Brgy. Madupayas in Badoc learned vermicomposting technologies and acquired supplies of vegetable, poultry, and livestock as part of the initiatives and interventions offered by the AMIA project in Ilocos Norte to help address issues on climate change and food inadequacy. PHOTO COURTESY OF RAFIS ILOCOS NORTE REGION FACEBOOK PAGE

Outputs of the Adaptation and Mitigation Initiatives in Agriculture (AMIA) project, titled “Community-based Action Research for Climate Resilient Agriculture (CRA) in Region 1,” enabled communities in Ilocos to have sufficient and stable food supply despite the challenges brought by the sudden emergence of the COVID-19 pandemic.

Produce derived from the project, such as vegetables, poultry, and livestock supplies, were distributed from Ilocos Sur to Baguio during the course of the enhanced community quarantine in May 2020.

Funded by the Department of Agriculture-Bureau of Agricultural Research (DA-BAR), the project was first piloted in San Emilio, Ilocos Sur in December 2016.

At present, the AMIA program is establishing and enhancing more

climate-resilient agriculture and fisheries livelihoods in various target communities through participatory action research. Hence, the program’s expansion with the launch of four new AMIA projects in the said region.

Community-level development interventions utilized in the program aim to facilitate the outscaling and further introduction of new CRA technologies, innovations, services, and practices to communities.

Such was the case of Brgy. Madupayas in the municipality of Badoc in Ilocos Norte, which, by adopting project interventions, had a stable food source amid the ongoing health crisis.

Among these interventions are the provision of shredder for vermicomposting projects and urban gardening, and suitable technologies

on the production of goat, native pig, free range chicken, and soybean. Community members also received trainings on organic production of crops. To date, the number of farmer-cooperators in the said community is at 32.

The success of this AMIA project paved the way to cover more areas and empower other communities in hopes of preparing farmers for the New Normal, especially those in high-risk areas.

The AMIA program was launched by DA in 2014, in response to pressing climate change concerns, for the benefit of local communities in high-risk areas for the purpose of increasing the communities’ ability to manage climate risks while pursuing sustainable livelihoods. ### (Jireh Alodia R. Laxamana)

**BAR CHRONICLE** highlights the bureau’s activities as the country’s national coordinating agency for agriculture and fisheries R4D, and provides updates on NaRDSAF-member institutions.

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# PSAU distributes *red tilapia* to frontliners, constituents in relief operations

In an effort to provide assistance to frontliners and its constituents amid the extended enhanced community quarantine (ECQ) due to the COVID-19 pandemic, the Pampanga State Agricultural University (PSAU), through its Intellectual Property and Technology Business Management (IP-TBM) Unit, distributed food bags which included the Department of Agriculture-Bureau of Agricultural Research (DA-BAR)-supported red tilapia on 8 May 2020 in Magalang, Pampanga.

Through the relief operations spearheaded by Dr. Honorio Soriano Jr., PSAU president, 125 kilograms of red *tilapia*, 500 kilograms of rice, and 50 trays of chicken eggs were procured, producing at least 100 food bags which were distributed to 45 stranded university students in dormitories and apartments due to the sudden implementation of ECQ; members of nearby communities in Magalang; and PSAU security personnel and agricultural workers who stand as the university's frontliners since the COVID-19 crisis began.

The relief operations conducted by PSAU was not only seen as a way to augment support to the local government of Magalang, but also to showcase its research for

development (R4D)-generated food-based technologies, and highlight the importance of providing healthier food options to its immediate community.

Dante Mendoza, project leader of the ongoing DA-BAR-funded project, "Utilization of Velvet Bean (*Mucuna pruriens*) as Feedstuff on the Aquaculture Performance of Red *Tilapia*," highlights the benefits of including the project's outputs as part of the relief.

"Having red *tilapia* as part of the PSAU relief operations opened an opportunity for us to promote not only the unique taste of the species, but also the viability of red *tilapia* farming. It could be the one of the many ways to contribute to the goal of food security in the Philippines, especially in these difficult times," underscored Mendoza.

Red *tilapia*, one of the species being cultured in PSAU Hatchery, were harvested and cured in brine solution a day prior the distribution. Walter Pacunana, PSAU IP-TBM Unit head and one of the study leaders of the project, said that curing, along with other postharvest techniques, is done to extend the shelf life and improve the flavor of the product. ### (Mara Shyn M. Valdeabella)

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186 percent higher than the Php 25-35/kg cost of mangosteen on normal season.

Embarking on his initial success, Mier, as continuously guided by DARCES' research recommendations, has already conducted his second trial of the technology of which fruits are to be harvested on December 2020 to January 2021.

To further improve the technology, Agapito Regulacion, researcher and DARCES chief who is also the proponent of the project, plans to take the project on its second phase focusing on the establishment of mangosteen orchard.

"We are planning to pilot the establishment of orchard for off- season [mangosteen] using larger planting materials and smaller planting distance so that we can induce more trees at early bearing stage. We also plan to control the height of the tree and root zone expansion for easier establishment of tunnel-type rain shelter for its maximized and efficient use," shared Chief Regulacion.### (Clarisse Mae N. Abao)

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The harvested red *tilapia*, rice, chicken eggs, and food bags will be distributed PSAU staff and student volunteers to the frontliners and stranded students. PHOTOS: MSVALDEABELLA

# WHY YOU SHOULD CONSIDER EDIBLE LANDSCAPING



Combining the art and science of food production, **Edible Landscaping (EL)** is the process of growing food-producing crops in the premium spaces in front of the house. It encourages home-based planting of crops aesthetically to create an attractive environment and to attain food security. Compared with conventional landscaping, EL utilizes vegetables, fruits, medicinal plants, and herbs as major plant materials.

## What can you benefit from EL?



**Healthy and renewable food source** as EL provides organic food which promotes practicality, self-sufficiency, and reduction of food costs



**Aesthetic landscape and agri-tourism** as you can explore opportunities to market and promote your produce



**Value addition and possible business venture** for you can sell your produce to your neighbors and gain profit.

## What do you need to start EL?



✓ seeds



✓ soil



✓ compost



✓ container



✓ area

## How do you start EL?

### STEP 1

**Draft your garden design** and carefully plan and analyze what your EL garden would look considering the basic elements (form, color, line, texture, size) and principles (balance, contrast, scale and proportion, emphasis, harmony) of design as well as the combination of plants.

### STEP 2

**Implement your project plan** ensuring you are equipped with knowledge on the seedlings and soil you will start on.

### STEP 3

**Maintain and monitor the progress** of your EL garden to ensure its sustainability and productivity.

# UPLB, DA-BAR eye edible landscaping as alternative food source in New Normal

Story by Rena S. Hermoso

Food production and distribution has been limited by the restrictions on movement of people and goods following the guidelines during the implementation of the enhanced community quarantine across Luzon and other parts of the country. Thus, to ensure food availability and accessibility, the Department of Agriculture (DA) initiated the Plant, Plant, Plant Program.

In line with the said program, the DA-Bureau of Agricultural Research (BAR) refocused its programs to promptly take action to minimize the drastic effects brought by the economy-paralyzing health crisis. One of its core subprograms is the Promotion of Urban Agriculture which aims to ensure sustainable food supply by directly engaging households and communities—urban and rural—on food production. Among the urban farming technologies promoted are vertical gardening, edible landscaping, square-foot gardening, and hydroponics.

Pioneered in 1999 by the late Dr. Leonido R. Naranja, edible landscaping merges science and creativity on growing a garden and producing food. Instead of planting conventional ornamental plants, organic vegetables, fruits, herbs, and medicinal plants are used.

Dr. Naranja's initial efforts on edible landscaping led to the partnership among the University of the Philippines Los Baños (UPLB), DA-BAR, and the DA-High Value Commercial Crops Development Program. After Dr. Naranja's passing in 2010, UPLB continued the project. Since then, the UPLB Edible Landscaping (EL) Team has been an active partner of DA-BAR on promoting edible landscaping.

Currently, the UPLB EL Team has two edible landscaping projects

funded by the bureau. The UPLB, DA-BAR eye edible landscaping as alternative food source in New Normal project, "Empowering Different Sectors of the Community through Edible Landscaping," aims to empower marginalized sectors through the establishment of edible landscaped community gardens. Meanwhile, the project, "Edible Landscaping Technology Promotion and Information Dissemination Campaign" aims to share information on edible landscaping through training and provide assistance in starting and developing landscape gardens.

DA-BAR in partnership with the UPLB EL Team, will be upscaling their previous projects to reach urban settlers and low- and middle-income households. Through this, the bureau hopes to encourage more people to replicate and practice edible landscaping in their backyards.

In the meantime, the UPLB EL

Team has been lending a helping hand to assist interested people who want to adopt the technology. The team provided technical knowledge and distributed planting materials.

Ann Carmeli Estive-Anila, one of the EL adopters, made the most out of this opportunity by introducing gardening to her son. Anila's grounds feature an edible landscape garden filled with 28 different vegetables, trees, herbs, and medicinal plants. Maintaining their backyard garden served as an experiential learning and bonding activity for Anila and her son while ensuring that their family will have safe, nutritious, and free food during the pandemic. ###

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Ann Carmeli Anila, a homegrown food advocate, says that now is the perfect time to introduce and teach his son, Jaeden Anila (in photo), the importance of gardening and its benefits to health and well-being. PHOTO COURTESY OF UPLB EL TEAM

# Growing mushrooms in the New Normal

Story by Chantale T. Francisco



Veronica Mangune (right), project officer-in-charge of the Mushroom Technology Center, prepares the mushroom spawns and fruiting bags for distribution. PHOTO COURTESY OF DA-CLIARC

Mushroom-growing and production are not new in the Philippines. It has been known since the 1990s. However, due to limited resources available, its status and production were sparse enough for people to lose interest in it.

With its immense potentials and benefits, the only thing that discourages people to venture in this field is the lack of knowledge, access to trainings, and quality planting materials.

This sparked the initiative of the Department of Agriculture-Central Luzon Integrated Agricultural Research Center (DA-CLIARC) to pursue a study on mushroom propagation technology that involved three components to improve income, especially of rice farmers: research and development; production and gene bank establishment; and training and extension services.

Funded by the DA-Bureau of Agricultural Research (BAR), these three components have respective sub-studies conducted to complete and ensure the project’s overall goal which is to generate and introduce low-cost

mushroom production and postharvest technologies to farmers.

## Research and Development

Under this component, three sub-studies were successfully actualized by DA-CLIARC that aimed to generate a product line of mushroom-based products for additional income of farmers. These products have high nutritional content because mushrooms alone are already rich in vitamins and minerals. These are good alternatives especially for those who are monitoring their fat and sugar intake.

One of the studies is on “Product Development and Shelf-life Extension of Pleurotus-based Mushroom Frozen Products” which produced 10 frozen varieties of products for commercialization. This product line included ice cream, ice drop, *kikiam*, *bola-bola*, nuggets, veggie-balls, *longganisa*, *tapa*, dumpling, and *shanghai*. Fresh mushroom fruits were harvested and added to these goods and then processed with the respective ingredients needed for each recipe.

Moreover, another study focused

on producing consumable treats with oyster mushrooms as main ingredient. This study, however, centers more on sweets and pastries. The study titled “Product Development of Pleurotus Mushroom-Based Sweets and Pastries for Commercialization” generated 10 goods for this product line including waffle, cupcake, *espasol*, macarons, pie tart, *pandesal*, brownies, sugar-coated mushroom, glazed mushroom, and *maja*.

Aside from these, nine mushroom-based condiments were also developed under this component. Through the study “Incorporation of Pleurotus Mushroom on The Processing and Development of Condiments, Mixes, And Sauces for Community-based Enterprises,” mushroom ketchup, pickle relish, gravy, chili paste, fish ball sauce, mayonnaise, sweet chili sauce, hot sauce, and barbecue sauce were developed.

The researchers conducted a sensory evaluation for each of the products and have gained positive feedback from the public in terms of

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taste, color, texture, and flavor.

Meanwhile, on shelf-life testing, these projects have also successfully prolonged the shelf-life of mushroom and have lessened its perishability. With rancidity as its main determiner, the product lines can last for months when kept and stored properly.

### Gene bank establishment and training services

The remaining two components of the project focused on increasing the awareness of growers on mushroom varieties and production. The gene bank aimed to serve as a source of starter cultures for individuals and institutions who have expressed their interest in mushroom growing, while the provision of training services intended to expand the know-hows and skills of the growers.

With that, the extension and training component, that originally

intended to cater 1,000 individuals, has expanded its training to 1,042 participants through a total of 31 training services provided.

When it comes to the gene bank establishment, researchers surpassed the target number to be produced and have reached 3,055 quality culture and 38,000 mushroom fruiting bags. Also, 18 edible mushroom varieties were cultured for continuous storage and maintenance.

At present, in response to DA's Ahon Lahat Pagkaing Sapat (ALPAS) Kontra COVID-19 program, mushroom fruiting bags have been distributed by DA-CLIARC Upland in Magalang, Pampanga for free. In addition, vegetable seeds and seedlings as well as grain spawns were also given to the members of Mushroom and High-Value Crops Producers Association in Tarlac. The institution is also preparing for the launching of their online seminar on

mushroom production.

Following the same initiative, another mushroom project also funded by DA-BAR titled "Establishment of Mushroom Development Center at DA-RCPC, City of Ilagan, Isabela," has also produced spawns which were recently allocated to community members who attended an on-site training on mushroom production in Cauayan City, Isabela.

As the country gears towards the New Normal post-pandemic, mushroom production and its by-products truly are seen as one of the most feasible sources of income because of its economic opportunities and advantages. ###

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focuses on boosting land productivity while utilizing less water. SRI practitioners also conduct a regular meeting every 2<sup>nd</sup> and last Tuesday of the month for an Agro Ecosystem Analysis and a participative discussion on their insights and observations. Nine farmers continued this practice even without the assistance or interventions from the DA.

Moreover, 30 women farmers have also been trained in corn-husk-handicraft-making and was provided with a starter kit after the training. An additional Php 50,000 was granted to the group when their business plan was approved under the fund transfer of DA-Office of the Secretary (OSEC) to the local government unit (LGU) of Banate in support to their agri-enterprise.

Aside from that, women fisherfolks were also given a livelihood opportunity that focuses on buri and pandan weaving to augment extra income aside from fishing. With their willingness to continue on the program, they were able to strategize a business plan worth Php 50,000 that was also supported under the fund

transfer of DA-OSEC to the Banate-LGU. Starter kits were also given as initial capital of their project.

Altheia Bajala, a farmer cooperator, said that the buri and pandan weaving intervention has helped the women farmers handle their expenses and other needs. Through the initiative, they were also given the opportunity to teach and share their learnings.

"Nabebenta naming ang aming gawa ng Php 25-50 per piece kaya malaking tulong na rin ito sa aming tahanan. Tinuturuan ko rin ang iba na gustong matuto dahil bukod sa pagbenta, nagagamit din naming ito sa pamamalengke dahil sadyang mas matibay kaysa sa cellophane," shares Bajala.

In addition to the alternative livelihoods on agri-fisheries, AMIA also introduced the importance of crop insurance to the farmers in Banate. Because it is free and only requires the presence of the farmers for an assessment interview, Jenny Balboa, the said native pig production beneficiary, also signed up for this opportunity.

"Dahil ang aming lugar ay prone

sa pagkasira, kapag insured, meron kaming nakukuhang pambili ng mga abono at 'di na namin kailangang umutang. Mga anim o pitong beses na rin akong nakapag-claim Iyong pinakamalaki ay Php 15,000 pagkatapos ng [typhoon] Yolanda para pang-start-up ulit namin," Balboa shared.

AMIA village beneficiaries were also exposed to Business Planning Workshop for Climate Resilient Agri-Enterprises and Stakeholders Forum to to share business plans.

Beneficiaries in Banate, Iloilo have indeed gained a lot of capacity-building trainings and financial help to protect them from losses and lean months due to climatic shifts. It also made them reach one of the ultimate goals of AMIA which is to empower one another through knowledge-sharing.

After almost three years of working on this program, the researchers are proud to declare that Banate has reached the desired resiliency to mitigate the backlash of climate change in the agriculture and fishery sector. ###

# Making of a Climate-resilient Community: The Story of Banate, Iloilo

Story by Chantale T. Francisco

According to research, in five years, climate change will further cause sea level rise and worsen rapid shifts in precipitation patterns. These changes can sadly intensify what our agriculture and fishery sector are experiencing today—disruption of both farming activities and productivity. With more than a million Filipinos relying on the said sector, livelihoods will likely be more distressed and threatened.

These problems are only a few of the issues that the Department of Agriculture (DA)-Western Visayas wanted to address in implementing the Adaptation and Mitigation Initiative in Agriculture (AMIA) program that aims to strengthen the resiliency and mobilization of identified vulnerable communities.

Researchers chose Brgys. Carmelo, Merced, and Libertad in Banate, Iloilo to be pilot testing sites of the project. From its inception in 2014, the AMIA program has

been successful in enhancing the community’s livelihood through proposed adaptation strategies.

Starting with a Climate Risk Vulnerability Assessment aided by the Iloilo State College of Fisheries and other criteria set by the team, the identification and selection of the AMIA village first took place in the process.

After this, researchers conducted a Participatory Rural Appraisal and Individual Farmer Profiling for the prioritization of Climate-Resilient Agriculture practices to be introduced in the community. This was participated by eight active and registered farmer organizations in Banate, namely: the Kaisahan ng mga Mangunguma sa Programang CARP, Merced-Carmelo Irrigators Association, Merced Farmers Association, Carmelo Farmers Association, Puros Farmers Association, Bagata Farmers Association, Propoban Farmers

Association, and Libertad Farmers Multi-Purpose Cooperative.

Based on initial evaluation conducted, native pig production, *babuyang walang amoy* production, system for rice intensification, backyard vegetable production using rainwater harvester, handicraft-making using corn husk and buri, and pandan weaving were among the identified farm and off-farm activities to be adopted because of their sustainability, resiliency, and cost-effectiveness.

Farmer Violeta Valenzuela, 71, is one of the beneficiaries who embraced and have reaped the benefits of the agricultural endeavors launched by the program. Being able to learn vegetable production techniques helped her to earn more and pay off the tuition of her grandson.

*“Sobra ang pasasalamat ko sa AMIA. Natuto ako ng iba’t ibang vegetable production technologies na nakaktulong sa pagtanim namin ng mga vegetable seeds na binigay ng DA,”* Valenzuela said.

One important goal of the AMIA village is for farmers to learn from, build rapport with, and empower each other. That is why the 15 beneficiaries of the *babuyang walang amoy* production and the other 15 of the native pig production technology meet every first Friday of the month with their fellow farmers to share their progress and insights on the program or technology they were able to avail.

*“Nakabenta na po ako ng pitong biik at nakapagbalik ng dalawa sa asosasyon bilang kasama ito sa kasunduan. Ang isang biik po na dalawang buwang gulang ay Php 3500. Tapos kapag malaki na ay Php 4,000-6,000. Mga nasa Php 50,000 na rin ang kinita ko simula noong nakuha ko iyong mga baboy,”* Jenny Balboa, a farmer-beneficiary of native pig production technology shared.

The same goes for the 90 beneficiaries of the System for Rice Intensification (SRI), a program that

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A demo on the pre-production process of the Backyard Vegetable Production using Rainwater Harvester program in the community. PHOTO: LAESPIRITU

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