



RESEARCH FOR DEVELOPMENT

BARDIGEST

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Sprouting to success:
Transforming IPs' livelihood
through mushroom processing

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ABOUT THE COVER



COVER PHOTO: DA-CLIARC FOR UPLAND DEVELOPMENT

From improving the agricultural practices and production systems in farming communities in Carranglan, Nueva Ecija, DA-Central Luzon launched another project to further utilize the potential of mushrooms by developing various food products.

Binbin Women Gardeners' Association and other mushroom growers and processors were capacitated on the processing of mushroom crackers from sourcing of quality raw materials to packaging of mushroom crackers—providing additional income to the members.

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2003 Gawad Oscar Florendo

Technology adoption: Toward a *tipping point*

Joell H. Lales

In the Philippines where agriculture is the main engine of economy, agricultural growth as a result of technology adoption remains significant in contributing to food security and economic growth, hence, improving the lives of the farming and fishing communities.

Access to relevant technologies and information enables farmers to improve productivity and engage in value-adding, thereby enhancing livelihood and income of households.

Cognizant to this, the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) continuously supports various programs, projects, and activities aimed at getting farming communities involve and adopt technologies. Together with our partners, we build the capacity and skills of our stakeholders in research for development (R4D) to ensure sustainability and catalyze inclusive value chain.

While it is always a challenge how to bring and fast track technology adoption to farmers, DA-BAR can share encouraging news in this 2023 maiden issue of the BAR R4D Digest—how farmers learn and adopt the technologies and more importantly how these technologies bring significant changes in their lives.

Four feature stories highlight the new opportunities from learning and adopting the technologies in soybean, rice, and mushroom. The interventions are creating new livelihood for their households, in addition to feeding their family with more nutritious food.

Part of our regular feature, is a contribution from the region pertaining to the technology on off-season onion production — timely, since onion is now gaining so much attention owing to its limited supply and very high price in the market. This promising technology will allow farmers to be more profitable and help ensure available supply of onion in the market during lean period and best prices for the product.

From the point of view of expert, a corner in this issue delves on capacitating the farmer-partners toward ensuring Good Agricultural Practices (GAP) compliance through trainings and provision of facilities. GAP, as a set of standards in farm operations, ensure that the food produced are safe to eat and of good quality —and we, as consumers want to maintain safe and good quality food and the best approach is to be aware of the potential risks and minimize the chance of contamination at every step from the farm to fork.

Finally, we give tribute to our farmers by showcasing five stories along with testimonies of their journey in embracing the technology that enabled them to bring about production and yield changes resulting to economic improvement in their lives.

Complementing our feature stories are the financial viability on straw mushroom vs oyster mushroom crackers production, as well as infographics on off-season onion. These illustrations will provide readers an overview of the prospects and benefits of venturing in such activities.

This issue of BAR R4D Digest centers on the experiences, lessons learned, and farmers' stories in adopting the technology. Each page highlights a story of achievement — a realization for DA-BAR to reaffirm its commitment in uplifting the lives of our farmers through relevant technologies and information. Thus, the bureau continues to improve its strategies — making focused and targeted strides that enable us to transform outputs into impacts. ■



Sprouting to success: Transforming IPs' livelihood through mushroom processing

Angelo N. Padura

In an uphill trail a few kilometers away from the town proper, one would notice the cold breeze brushing through one's skin under the shade of pine trees surrounding the area. Surprisingly, there's a place like Baguio in Carranglan, Nueva Ecija found in the humble community called Sitio Binbin.

For many years, the indigenous peoples (IP) living in Sitio Binbin were engaged in farming vegetables like carrots, beans, cucumber, tomato, cabbage, potato, ginger, chayote, and bitter melon which serve as their main

source of income. Little do they know that their home is also suited for mushroom farming, hence augmenting their livelihood through mushroom processing.

However, the pungent scent moving around the backyard gardens and farm lands reveal farmers' need for interventions. Vegetable farmers in Sitio Binbin are accustomed to excessive use of chemical pesticides, even more so, combining different chemical pesticides known as "cocktailing" which pose health risks not only to them but also to consumers.

Where it all started

In 2019, DA-Central Luzon, through its Central Luzon Integrated Agricultural Research Center (CLIARC) for Upland Development, implemented a research project to improve the agricultural practices and production systems of IPs in the Bugkalot and the Kalanguya ethnic communities — two of the many farming communities in Carranglan, Nueva Ecija.

The team introduced oyster and shiitake mushroom as an additional crop which the IPs can produce in their barangay or even at their own backyard garden.



PHOTO: MEGARCES

“We trained the IPs on how to culture mushrooms properly — from preparing the fruiting bags, to cultivating, up to harvesting the produce. We also focused on the proper use of pesticides and fertilizers knowing that the farmers were used to excessive use and cocktail of these chemicals,” DA-Central Luzon-CLIARC chief and project leader Dr. Emily A. Soriano explained.

After a season of coaching, monitoring, and troubleshooting, farmers reported an increase in their vegetable-mushroom production — particularly on

mushroom production. Dr. Soriano reported that mushroom growers can produce approximately 1,000 bags of mushroom in a month.

After the success in mushroom production, the team had to confront another challenge.

“Mushrooms easily perish, making it quite problematic for growers situated in remote places like Sitio Binbin to maintain the freshness of their produce on its way to market. So we had to think of ways on how to turn the mushroom produce profitable despite it being highly perishable,” Dr. Soriano said.

From fruiting bags to healthy snack packs

Mushrooms are a good source of protein and antioxidants. Studies show that mushrooms have high amounts of vitamins and minerals such as iron, calcium, potassium, and copper, that help ease muscle problems. It is also proven to contain bioactive compounds which boost the body’s immunity against several bacterial and viral diseases.

With all its notable healthy characteristics, the research team continued studying ways to utilize the potential of mushrooms. Eventually, the team came up with different food products that take mushroom as its main ingredient — one of such is the mushroom crackers.

In 2020, DA-Central Luzon launched another project which aimed to upscale mushroom crackers production and increase the profit of the members of Binbin Women Gardeners’ Association (BWGA), and other mushroom growers and processors in Carranglan, Nueva Ecija.

BWGA, an association composed of indigenous peoples in Sitio Binbin, Carranglan, also depends on farming upland vegetables as their main source of income.

“A Participatory Rural Appraisal revealed that before project implementation, the majority of the members have an average monthly income of PhP 5,000 which is considered below both the food and poverty threshold,” Dr. Soriano stated.

With funding support from DA-Bureau of Agricultural Research, the said project generated low-cost and mature technologies which includes processing of oyster mushrooms into crackers using vegetable flour.

Hands-on training was conducted on the processing of mushroom crackers to BWGA members focusing on the mass production. The members were capacitated on the step-by-step process from sourcing of quality raw materials to packaging of mushroom crackers.

Marisol R. Julian, the youngest member of the BWGA, is assigned to monitor the day-to-day activities in the communal mushroom house such as ensuring that spawn bags are watered regularly and harvesting ready-to-process oyster mushroom.

“Sa pamamagitan ng training na isinagawa ng DA-Central Luzon, natutunan namin kung paano gumawa ng crackers mula sa mga oyster mushroom na aming itinanim,” she said.

Toward a more successful venture

BWGA members reported that mushroom processing technology is a good source of additional income for them.

“Kung dati ay tanging sa pagtanim lamang ng kamatis, sitaw, at repolyo kami kumukuha ng pang-araw-araw naming panggastos, ngayon ay nakakatulong sa amin ang kita mula sa pagbibinhi at pagpoproseso ng mushroom crackers,” Julian shared. ▶21



Not a fatty one!

Healthy and affordable protein source from soybean

Ma. Eloisa H. Aquino

Soybean or *utaw* is considered to be among the best source of plant-based protein because of its 36-56% dry weight protein content. It is now being processed into a concentrated product known as texturized full-fatted soybean meal or texturized vegetable protein (TVP).

A plant-based protein product valuable for vegan people, soybean TVP is rich in complete protein and contains good fats levels and good source of all essential amino acids, making it as an excellent alternative to meat. Also, it serves as an addition to soybean products commonly processed into soy milk, flour, sauce, tofu, and oil.

The texturized full-fatted soybean is a combination of soy flour (grounded soy) and water—actually composed of soybean meal and soy oil. This is being processed in a soybean extruder machine with a temperature of 65-70°Celsius. The said machine was developed by the Institute of Food Science and Technology of the University of the Philippines Los Baños.

From field to secondary products

Seeing the potential of this processed product, DA-Cagayan Valley Research Center (CVRC) adapted the said technology and transformed it into secondary marketable food products such as soy balls, patties, and sausages—

putting added value to soybean. Dubbed as the Soy Yum Food Products, they are now a registered trademark in Intellectual Property Office of the Philippines.

For breakfast, one can enjoy a healthier version of skinless *longganisa* made from plant-based protein with no artificial flavorings. Burger lovers can indulge in a “guilt-free” option for a burger meat patty produced from natural ingredients. Snacks or viands on a plate can be filled with soy balls, a healthier alternative to conventional meatballs with no artificial flavors.

Also, the research team and the partner farmers' cooperative and association is now focusing on the market expansion of the products. In order to promote and expand the market of full-fatted soybean meal and its secondary products, they are being showcased at trade fairs and exhibits within the region.

Supported by the DA-BAR, the texturized full-fatted soybean meal and its by-products were developed and undergone focus group discussions and market research initiatives. These activities were done to further develop and improve its processing technology. The label and packaging of the products were also improved based on the needs and preferences of its target market.

From product development to technology transfer

After a series of product improvement initiatives by the DA-CVRC Food Product Research and Development Center, the matured products/technology were then transferred to the Cagayan Valley Soybean Producers and Processors Association (CVSPPA). The organization intends to bring together all soybean producers and

processors in the Cagayan Valley Region.

CVSPPA's estimated annual excess volume of soybean production of 10-15 tons are targeted to be used for soy TVP production and processing. Combined with the buffer supply of soybean and soy TVP from DA-CVRC, the excess raw materials of CVSPPA can be used to initially cater the protein need of its target market share at least 4% (1,821kg monthly) of the total protein needs of the members of the Seventh Day Adventist Church in the region.

CVSPPA start off producing Full-Fatted Soybean Meal and other secondary products for promotion and commercialization subsequent to their actual hands-on training on the processing of the mentioned product.

"Itinuturo sa amin ng DA-CVRC ang bagong teknolohiya sa pagproseso mula sa soybean o utaw hanggang sa pag-transform nito bilang Soy TVP o texturized full-fatted soybean meal, kasama na rin dito ang paggawa ng mga by-products na tulad ng soy ball, soy patties, at soy longganisa upang mas lalong madagdagan ang value ng

nasabing produkto," Wilyard B. Bautista, CVSPPA president said.

In addition to the benefits it can provide to the health of consumers, it also provides additional income to processors and sellers of the product.

"Ang kasalukuyang presyo ng soybean seeds sa merkado ay umaabot sa Php 40 hanggang Php 60/kg ngunit ang texturized full-fatted soybean meals ay nagbibigay ng mas maraming kita. Ang isang kilo ng soybean seeds ay maaring gumawa ng kalahating kilo ng textured full-fatted soybean meal na maaring ibenta ng mga miyembro sa halagang Php 120 hanggang Php 140/pack (500 grams)," Bautista added.

With this, the DA-CVRC was able to capacitate the organization and now they are producing and marketing the Soy-Yum product line not just inside their organization but within the region as well. ■

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PHOTO COURTESY OF DA-CVRC

Itinuturo sa amin ng DA CVRC ang bagong teknolohiya sa pagproseso mula sa soybean o utaw hanggang sa pag-transform nito bilang Soy TVP o Texturized Full-Fatted Soybean Meal, kasama na rin dito ang paggawa ng mga by-products na tulad ng soy ball, soy patties, at soy longganisa upang mas lalong madagdagan ang value ng nasabing produkto.

WILYARD B. BAUTISTA, CVSPPA

Rice builds *community*, turns into *business*

Diwa J. Velasquez

In the Philippines, rice is considered as one of the most consumed agricultural products by the Filipinos. With its history and cultural significance, people tend to eat their meals with rice, especially when it is best paired with their favorite dishes. In fact, Filipinos also love to cook rice with variations such as *lugaw*, *chamorado*, *sinangag*, *ginataan*, and *suman* among others, hence, cooking these may also require different types of rice.

Given that rice can be cooked in unique ways, the demand for high quality rice is increasing due to changes in consumer preferences. This has become an opportunity for farmers to market their own products, moreover, increasing their productivity and income.

However, the majority of smallhold farmers in the country struggle with rising competition in the global market vis-à-vis high cost and limited availability of equipment and resources and low yield rates.

With this, DA-Philippine Rice Research Institute (PhilRice) developed a program called, Rice Business Innovations System (RiceBIS) Community that illustrates the application of new business models of inclusive and transformative rice farming in provinces with low productivity and income.

The RiceBIS approach

“The RiceBIS uses a market-driven approach in optimizing farm resources not only in production but also in processing and

marketing,” said Dr. Aurora M. Corales, program leader of RiceBIS. While it strengthens the production system, the program draws more on the agribusiness framework thus, increasing the engagement of farmers into rice and rice-based enterprises.

The RiceBIS program involves strong strategic collaborations. A multi-disciplinary team composed of various stakeholders called the Site Working is formed in every RiceBIS community to provide network of local support to farmers and ensure the success of the agroenterprise development process. The program is composed of the following components: a) strategic communication that prepares the hearts and minds of the farmers and other stakeholders involved; b) community engagement where it organizes farmers to have a collective vision for their RiceBIS community; c) capacity building where farmers undergo technical, managerial, and entrepreneurial skills trainings; and d) rural agroenterprise development that provides assistance to communities on



enterprise development, product development, and market linkages; and e) monitoring and evaluation that captures farm-level data and examines whether investments are translated into outputs and eventually impacts.

These components are essential in carrying out services that are critical for smallholder farmers given the program's goal to reach 1t/ha and 0.5t/ha increase in yield in irrigated and rainfed areas, respectively. Additionally, the expected outcomes are 30% reduction in production cost, 12% less postharvest losses, 70% improvement in technology adoption, and 25% increase in farming household income.

Expanding provinces and communities

The RiceBIS community was first introduced to eight provinces namely, Ilocos Norte, Isabela, Nueva Ecija, Quezon, Albay, Negros Occidental, Cotabato, and Agusan del Sur in 2017.

Through the funding of DA-BAR in 2019, RiceBIS has expanded to

cover 15 additional sites—Quirino, Ifugao, Zambales, Pangasinan, Tarlac, Masbate, Negros Oriental, and Agusan del Norte bringing a total of 16 provinces and 23 RiceBIS communities. Cluster formation, capacity building and strengthening, technology demonstration, field days and forum, and agroenterprise development were the focus of activities among farmer cooperatives and associations in order to facilitate value-adding activities for consolidation and collective marketing.

From the farmer's mouth

"Ang RiceBIS ay business. Yung programa ng DA-PhilRice, tutulungan ka niyang mahanap 'yong way kung paano mabebenta ang palay mo na hindi ka malulugi," said Lionisa H. Bustamante, one of the beneficiaries of the RiceBIS program. She is also the current auditor of Humilog Farmer's Association from Agusan del Norte.

Explaining how RiceBIS made a positive impact on their rice production, Bustamante further stated, *"Ipinakilala sa amin iyong*

agroenterprise at napagkasunduan ng cluster na magtayo ng bigasan. Akala ko dati ang traders lang ang pwede magtayo ng business pagdating sa bigas. Ngayon pinupuntahan na ako ng mga bumibili at nagtatanong kung mayroon ba akong available na bigas. Minsan nauubusan kami ng paninda talaga."

One of the sustainability plans of the RiceBIS program is to make the farming communities self-reliant and self-sustaining. Through the assistance of local government units and municipal agricultural offices, businesses may be strengthened across regions and pave the way in encouraging smallholder farmers to adopt agroenterprises.

Currently, DA-PhilRice aims to institutionalize the RiceBIS concept and continuously monitor and evaluate the RiceBIS communities in the selected provinces. ■

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Cultivating livelihood through edible mushrooms

Kathleen Mae B. Bulquerin

Well-known for their alluring culinary qualities, mushroom is a valuable food in today's society because it is minimal in calories, carbs, fat, and sodium, as well as being cholesterol-free.

Mushroom cultivation can play an important role in helping rural people strengthen their livelihoods and become less vulnerable to hunger and poverty. The cultivation requires a wide range of activities suitable for people with various needs, diverse interests, and specific capabilities. It is also ideal for family workshops as a means of livelihood.

In the Philippines, mushroom production has been existing for a long time. However, not a lot of Filipinos have ventured into it due to lack of awareness.

That is why the team from the Quirino State University (QSU) led by Dr. Fredisminda M. Dolojan spearheaded the DA-BAR-funded project titled, Support to Mass Production of Mushrooms in Quirino Province, which aims to sustain food production amid COVID-19 threat through the expanded mushroom production.

Augmenting food security with mushroom

According to Dr. Dolojan, the project, which was implemented in July 2020, was created due to the food security threat of the long period of COVID-19 lockdown imposed basically in all of the localities in the country.

"We cannot afford to simply wait and see what is to happen. We, in QSU, are rather mandated to be proactive catalysts and be agents for development in the community. We are to make use of whatever resources and harness the same to make it," said Dr. Dolojan.

Community development through mushroom cultivation

As of now, the province of Quirino can only produce 25kg of *Pleurotus* in 100 fruiting bags housed in a 120sqm nipa mushroom hut. While a *Volvariella sp.* mushroom grower can produce an average of 5 to 7kg of mushroom for a period of three months.

To accelerate and further increase the production through augmenting and operationalizing the existing mushroom laboratories in the university and in the experiment stations, QSU, through their extension department, reached out and extended their mushroom technology generated for mushroom farmers in the province to help them lift their way of living and to cope up with the situation they are facing now at the onset of COVID-19 pandemic.

For starters, the technology adoption of mushroom production in Quirino province was expanded. From then 25 mushroom growers of *Volvariella sp.* mushroom found in one barangay to a now 850 trained mushroom growers of *Pleurotus* and *Volvariella sp.* mushroom. They were provided with technical know-how and a start-up kit of 50

fruiting bags and 100 bags spawn of *Volvariella sp.* mushroom. DA-BAR provided the start-up capital for these mushroom growers while QSU extension staff technically assisted them.

They also forged a partnership with the DA-Quirino Experiment Station (DA-QES) through a memorandum of agreement to jointly produce fruiting bags for *Pleurotus* and spawn of *Volvariella sp.* to accelerate the adoption of these mushroom. A total of 26,150 fruiting bags had been produced and distributed to 523 trained interested mushroom growers throughout the province.

The project team from QSU and DA-QES jointly produced 20,328 *Volvariella sp.* spawn bags which were evenly distributed to 847 trained farmers, women, youth who are members of 4H-Club at Wasid and Sangbay Nagtipunan, Quirino and indigenous people members of the Palacian Indigenous People Association. A memorandum of understanding was crafted and entered between the university and these associations, cooperatives and 4H-Club, cooperators and even overseas Filipino workers for mushroom technology adaptation.

Furthermore, a technology adoption agreement was also crafted and entered into between QSU and those cooperatives such as Puswak Multipurpose Cooperative for adopting the mushroom technology shared to them.

The project team was able to establish 25 demo sites to showcase mushroom cultivation technology. Ten field days were also conducted enabling other interested farmers to learn about the technology and visit the mushroom production site.

Devited P. Jaramillo, one of the beneficiaries of the project from Liwayway, Diffun, Quirino, said that the adopted technology allowed him to make the mushroom production his main source of income.

“Sa ngayon, may tatlong bahay na akong pinagsasabitan ng mga fruiting bags na siyang pinagharvest-an ko na umaabot ng

average na 400kg pleurotus mushroom at 300 fruiting bags worth PhP 35/fruiting bag sa isang araw na dinadala ko pa sa Nueva Vizcaya at Isabela,” said Jaramillo.

“Ang dating additional lang na source ng aming income ay naging major source ng income na,” he added.

Since the majority of the mushroom growers were mothers, they were also trained on various mushroom preparations such as *Pleurotus* balls, patties, and burgers. Drying method was also shared to lengthen the lifespan of the mushroom, as part of its value-adding activity.

“The COVID-19 pandemic has not been a threat for the project team to deliver the target output, in fact, reaching people or finding beneficiaries and cooperators of the project is even more easy and advantageous due to the lockdown condition,” said Dr. Dolojan.

“The undertaking provided an opportunity for business enthusiasts to be involved in mushroom selling, and creating work and employment for people who were just confined in their respective houses,” she added. ■

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PHOTO COURTESY OF QSU

Increasing milkfish fry production through new farmer's practices learned

Maria Elena M. Garces

Quezon is the second top milkfish producing province in the country but fish farmers have this perennial problem of insufficient supply of quality fry and fingerlings to stock their nursery and grow out ponds. Most of the nursery farmers procure their milkfish fry outside the province, where majority of the fry are imported from Indonesia.

“But unknown to many fish farmers, the province of Quezon has three milkfish hatcheries that could supply the needs of the nursery fish farmers. Through the project titled, Enhanced Fingerling Production through Outscaling of Improved Milkfish (*Chanos chanos*) Hatchery and Nursery Protocols in Quezon Province, and in coordination with the DA-Bureau of Fisheries and Aquatic Resources-CALABARZON, the DA-National Fisheries Research and Development Institute (NFRDI), has selected three milkfish hatcheries and seven nurseries from the province of Quezon and linked them together as one village-level hatchery-nursery cluster,” Frederick B. Muyot, study leader, explained.

The hatcheries were located in Lucena City and Unisan while the nurseries were situated in Padre Burgos, Agdangan, Unisan, Calauag, and Perez. All of the milkfish fry were sourced from the three hatcheries and were reared by the nursery fish farmers to fingerling size (2-4 inches) and sold them to grow-out fish farmers in the province of Quezon and adjacent provinces.

With the implementation of the project, Tommy Aquafarm Hatchery became one of the partner cooperators for the milkfish hatchery component.

Timoteo I. Maligaya or fondly called Mang Tommy, 60 years old, is the owner and operator of the Tommy Aquafarm Hatchery located in Lucena, Quezon. Married to Dr. Remy Maligaya, whose family is operating fishponds in Capiz, he was encouraged by his wife to go into the same business.

At first he started trading mudcrab from Bicol and brought it to Capiz to fatten and sell. He learned a lot while going around different fish farms. Eventually, he rented a prawn hatchery facility in Mercedes, Camarines Norte, where he produced prawn larvae and sold these in Bicol, Bulacan, and Pampanga. But then, the prawn industry became unstable so he thought of changing his business path. He went to Indonesia to import milkfish fry, which was then the “in-demand” commodity in Bulacan. After some time, “*nalugi ang business ko, kasi karamihan sa mga buyers ko ay hindi na nakabayad*,” Mang Tommy sadly narrated.

While he was in Indonesia, Mang Tommy learned how to manage and operate a milkfish hatchery. He thought of buying one prawn hatchery facility which recently closed down and converted this into milkfish hatchery farm. He then hired an experienced

Kumikita na ako ng malaki, nakakatulong pa ako sa industriya ng bangus. Maraming salamat po sa mga tumulong.

TIMOTEO I. MALIGAYA, QUEZON

technician from Iloilo and started his milkfish hatchery in Talao-Talao, Lucena City.

When Mang Tommy realized that there is also a great demand for milkfish fingerlings, he tried operating a milkfish nursery in Bignay Dos, Sariaya, Quezon. He reared the milkfish fry to size 3-4 and sold these in Padre Burgos, Quezon and Talisay, Batangas. He also tried growing milkfish to marketable size in four cages in Padre Burgos. Presently, his hatchery, nursery, and grow out cages are doing well and his fresh produce has a good market.





PHOTO: APADURA

Together with other milkfish cooperators, Mang Tommy underwent trainings on improved hatchery protocols focusing on strict monitoring of larval feeding to ensure adequate rotifer density as required by larval diet to achieve higher survival of fry. Optimum water quality is also maintained by changing the water daily and siphoning bottom of tanks.

The project has supported the provision of agricultural inputs and facility rehabilitation needed in the hatchery operations. In Mang Tommy's hatchery farm, additional concrete tanks for green water were provided to guarantee abundant growth of rotifer for his larvae.

With the technology intervention, Mang Tommy was able to produce 3,246,500 fry which is more than the target production of 1.2M fry only, in 10 cycles with 21-26% fry survival rate.

"The increase in fry production and income helped my child graduate

with a degree in Medicine, pay for the monthly installment of my service vehicle, and also provided employment in our community.

Today, Mang Tommy has all the reasons to smile, "*Kumikita na ako ng malaki, nakakatulong pa ako sa industriya ng bangus. Maraming salamat po sa mga tumulong.*" ■

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A man with dark hair, wearing a green long-sleeved shirt over a white t-shirt, is leaning over a raised seedbed in a rain shelter. He is holding a bunch of harvested purple onions. The shelter is constructed with white plastic film supported by wooden poles. The background shows more of the seedbeds and the shelter structure.

No tears for off-season onion production

Salvador M. Bulda

A common saying “My wallet is like an onion, when I open it, it makes me cry” by unknown is a truthful experience of farmers in Nueva Vizcaya during harvest on the regular season between February to March.

This is because, there is high supply of onion in the market which by law of supply and demand, brings its price from PhP 29 to PhP 45/kg, or as low as PhP 10/kg. This results to low income for farmers ranging from PhP 51,000 to PhP 62,000/ha.

To address these problems, through the funding support of DA-BAR, the project on off-season onion production was conducted

in Nueva Vizcaya and Cagayan—possibly turning tears into big smiles.

DA-Cagayan Valley introduced the cropping period on the months of August (sowing) to December (harvesting) which coincides with the rainy season; rainshelter made up of roundbar or bamboo with polyethylene film which is folded during sunny day and spread during rainy season to prevent high moisture that aggravates occurrence of twister disease; and variety suited for off-season production (Super Pinoy) as a result of variety trials with maturity of 110-120 days after sowing or 90-100 days after transplanting (DAT).

Also, the technology showcased the use of: a) raised seedbeds with 20-30 centimeters height with 1 meter width, and 6, 12, or 18m length; b) Soil Laboratory Analysis recommendation for fertilizer management; calcium boron (5L/ha) applied at 30, 60 DAT to improve bulb development, and c) Integrated Pest Management and use of bio-control agent (BCA) such as *Trichoderma spp.* at 30 packs/ha for pest management. Area recommended for off-season onion ranges from 200-1,000sqm for easier management.

These technologies are showcased from Community-based Participatory Action Research



PHOTO: RHERMOSO

(CPAR) in Aritao, Nueva Vizcaya to Outscaling of Off-Season Onion Production in Nueva Vizcaya and Cagayan from 20 farmer-cooperators to 133 off-season onion farmers, respectively.

With this technology, during the cropping period in 2021, onion farmers attained an average yield of 1,310kg/1,000sqm of off-season onion planted along with rice. The average net income generated by our onion farmers planted in rice areas was PhP 58,565.91/1,000sqm with a Return on Investment (ROI) of 145%, which means, for every PhP 1 invested, there is a return of PhP 1.45.

But there's more on off-season onion! Corn farmers who usually practice corn-corn, adopted this technology with harvest of 1,430kg/1,000sqm. More income was generated in corn-based amounting to PhP 55,050.0/1,000sqm with ROI of 69% or for every PhP 1 invested, a return of PhP 0.69 was attained.

"I do not plant onions before, but when I experienced growing off-season in the last cropping I proved that its cultivation is very profitable. I harvested 200kg from a 200sqm land area. The harvested 180kg was sold at PhP 220/kg, while the remaining harvest of 20kg was stored for household use due to the high cost of buying onions in the market," said Celso Gabaon, farmer-cooperator in Nangalisan, Bagabag, Nueva Vizcaya.

Also during the conducted field day on 19 December 2022, he shared that he used his income from the off-season to purchase additional materials such as round bar and PE film.

"I want to expand my farm area this season since I experienced higher profitability using this technology," he added.

Ronnie D. Mapalo, another farmer-cooperator in Bone South, Aritao, Nueva Vizcaya acknowledged DA-Cagayan Valley's introduced technology off-season onion production in Aritao, Nueva Vizcaya.

"In planting off-season onion, interventions including use of rain shelter and raised beds were introduced by DA-Cagayan Valley. These are necessary to protect the crops from heavy rainfall and high moisture since planting season coincide with rainy season. We also followed the result of the Soil Laboratory Analysis to ensure what fertilizer to use resulting in a reduced production cost," he shared.

"This is my 3rd cropping for off-season onion. During my 1st harvest at my 300sqm, I harvested 350kg. I sold this at PhP100/kg, which is three times higher than the price of onion during regular season. I used my income from the off-season onion as an additional capital for the regular season. As I experienced higher income from adopting this technology, I encourage my fellow onion farmers to do the same," Mapalo added.

From Calitlitan, Aritao, Nueva Vizcaya, farmer-cooperator Gerardo Barnachea also shared how he started planting off-season onion three years ago when DA Cagayan Valley-Nueva Vizcaya Experiment Station introduced the technologies.

"I planted Super Pinoy variety because it was proven for off-season. Second, I followed raised beds and installed rainshelter to avoid high moisture during rainy season. I submitted soil sample for Soil Laboratory Analysis to determine what fertilizers I will apply," he said.

"The advantage of off-season onion offers higher price resulting to higher income. In my 400sqm, I harvested 1,000kg which was sold at PhP120/kg. I used my income here to buy my seeds and fertilizers and payment of farm labor for the regular season. I encourage my co-farmers in Calitlitan to adopt off-season onion production so that they can also experience higher income from onion," Barnachea added. ■

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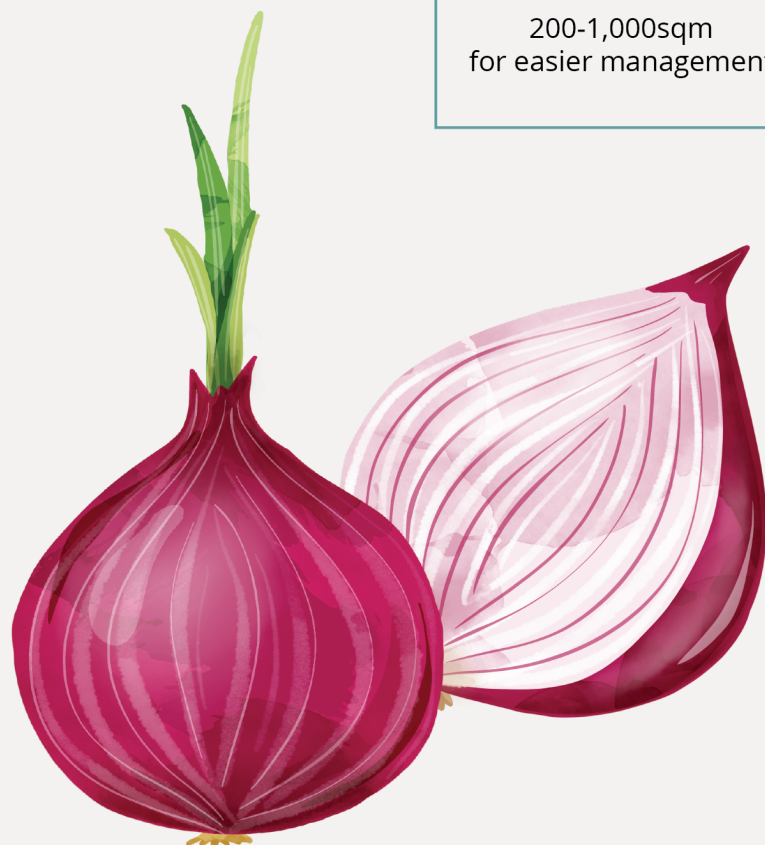
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ONIONS IN DECEMBER!?

OUTSCALING OF OFF-SEASON ONION PRODUCTION IN THE RICE-BASED AREAS IN NUEVA VIZCAYA

Recommended Area for Planting

200-1,000sqm
for easier management



HOW?

This technology allows farmers to grow onions even during off-season when weather conditions are not at their best. This is an important development because onions are a staple of every major cuisine in many parts of the world, and the ability to grow them year-round will help to ensure its consistent supply. Additionally, this will also help to boost the income of farmers, as they will be able to sell their onions at a higher price than they would during the regular season.

OBJECTIVES



- Increase production of onion from 0.50kg/sqm to 1.04kg/sqm through matured packaged of technologies during off-season period.
- Strengthen the capacities of 125 farmers and 3 municipalities on production/postproduction.
- Develop sustainable support mechanisms and establish connections with various support services

TECHNOLOGY INTERVENTION



Use of Super Pinoy variety

The Super Pinoy variety is suitable for planting and was tested through variety trials with a maturity of 110-120 days after sowing (DAS) or 90-100 days after transplanting (DAT).



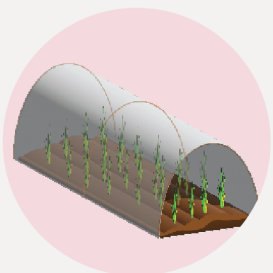
Raised Seedbeds

Establish raised seedbeds with 20-30 centimeters height with 1-meter width, and 6, 12, or 18-meter length depending on the area.



Off-Season Planting

Sowing and planting take place in August and September, and harvesting in December.



Use of Rain shelter

Use of rain shelter made of round bar or bamboo with polyethylene film which is folded during sunny days and spread during the rainy season to prevent high moisture that aggravates the occurrence of twister disease.



Fertilizer Management

Follow the Soil Laboratory Analysis recommendation for fertilizer management and use of calcium boron (5L/ha) applied at 30, 60 DAT to improve bulb development.



Pesticide Management

Follow Integrated Pest Management and use of bio-control agents such as *Trichoderma spp.* at 30 packs/ha for pest management.



The journey to farmers' success

Virgilia D. Arellano

The goal of modern-day agriculture is to shift from conventional farming into a minimal pesticide residue and high-quality agricultural farms. Studies show that Good Agricultural Practices (GAP) is an international level code of practice that concerns all activities done in the farm—from the cultivation of the soil, planting, irrigation practices, fertilization, and pesticide application to daily farm activities, harvesting, and postharvest undertakings. Relevant to this, consumers are assured of safe and quality agricultural products.

In the Philippines, the DA's Eight Paradigms elevate to address the Food Safety Act of 2013 with the adoption of strategies and schemes like the integration of GAP protocols and standards. In line with this, an established certification scheme has taken place starting from the municipalities to regional offices and DA-Bureau of Plant Industry. Technical assistance was provided for every prospective GAP farm and certification process was established in the earlier projects done by DA-CALABARZON spearheaded by its Research Division.

Consequently, the negative effects brought by the worldwide pandemic continuously post threat on food and nutrition security. In fact, the depleting stocks in supermarkets and the fragmented supply chains for local fruits, vegetables, and livestock products exacerbate the accessibility to food.

This situation calls for the enhanced local food systems and policies that will aid in combatting the effects of COVID-19 to food and nutrition security risks. Additionally, investments on effective food storage and establishment of market linkage and partnership will bring a leverage of support to ensure the smooth flow of trade for local produce. The GAP standard is highly imperative to overcome menaces to food availability, accessibility, and security.

Capacitation of farmer-cooperators

The DA-CALABARZON, through its Research Division, paved its way in ensuring that farmers in the region will have GAP certified farms. To do this, the region has built strong partnerships with the local government units (LGU) through the Municipal Agriculturist Office (MAO). They reached farmer cooperatives and associations (FCAs) in the selected barangays namely: a) Magallanes Samahan ng Magsasaka ng Kay-apas at Medina (MAGSAMAKAME); b) Pacheco Agrarian Reform Cooperative; c) SAVEFAS- Sabang Vegetables Farmer Association; d) Kaytigbak Irrigator's Association; and e) Baliwag Farmers Associations, Inc.

To further strengthen the knowledge, skills, and practices of the selected farmer-cooperators, trainings and workshops on Philippine GAP (PhilGAP) standards and protocols, vegetable production, community

organizing, value formation, clustering, primary processing, and Good Manufacturing Practices were held. As such, these trainings will allow cooperatives and associations to attain its long-term plan for the municipality which is to be the “Vegetable Basket of Cavite.”

Establishment of farm structures and facilities

One of the projects initiated by the region focused on the outscaling of vegetable-based farming systems towards GAP certification in Magallanes, Cavite. Its goal is to provide inputs, designed zoning, and production plan for clustered sites and constructed facilities. Moreover, through this BAR-funded project, the chosen FCAs has established farms in compliance with PhilGAP standards and protocols.

“Nabigyan din kami ng pagkakataon na malaman ang GAP kung saan nakakatulong ito para sa kaligtasan din naming magsasaka. Hindi na rin kami nahihirapan magbenta ng mga kalakal dahil mayroon na kaming mga

institutional buyers na nakakausap,” said Procorpio G. Marges, a 73-year-old farmer-cooperator and manager of MAGSAMAKAME. Through GAP, Marges mentioned that the crops being produced and harvested are safe and have improved quality.

In establishing farm structures and facilities, the regional office’s Regional Agricultural Engineering Division conducted a site visit to assess the GAP compliance of the farms. The research team was able to carry out site inspection and survey of farms for the establishment of simple farm structures and facilities such as storage rooms, packing areas, and comfort rooms. Moreover, designs for the low cost facilities were created. Regular project monitoring was done to ensure the continuity of the construction.

One of the initiatives of the project was the experiential tour called Lakbay Aral to the Cavite Agricultural Research and Experiment Station demo farm in the adjacent municipality of Maragondon, Cavite. The tour

Nabigyan din kami ng pagkakataon na malaman ang GAP kung saan nakakatulong ito para sa kaligtasan din naming magsasaka. Hindi na rin kami nahihirapan magbenta ng mga kalakal dahil mayroon na kaming mga institutional buyers na nakakausap.

PROCORPIO G. MARGES, MAGSAMAKAME



aims to showcase what a GAP-certified farm is and it helped the farmers in gaining ideas and insights, particularly on its investment cost.

Ensuring GAP compliance

To attain GAP compliance, the farmers were trained to modify some of their traditional methods of farming, especially the non-judicious use of synthetic pesticides. Farmers were aware of the methods of attaining and retaining food safety, quality produce, workers' health, welfare and safety, and environmental preservation. By being GAP-certified, farmers are now able to penetrate institutional buyers and private companies.

Currently, through the initiative of the MAO, farmers started their partnership with the Jollibee Group Foundation through the Farmer Entrepreneurship Program. This helped them supply their produce to Jollibee Foods Corporation and are confidently starting to expand to possible institutional markets.

The GAP certification is not just a piece of paper but an overall modification in the production process that will enhance the productivity, improve product quality, and ensure marketability of farm produce toward profitability.

A total of 37 farms passed the first batch of PhilGAP certification with 17 farms receiving a fully compliant grade, while the others have minor non-compliances. They are set to receive their PhilGAP certificates soon. ■

A total of 37 farms passed the first batch of PhilGAP certification with 17 farms receiving a fully compliant grade, while the others have minor non-compliances. They are set to receive their PhilGAP certificates soon.





PHOTOS: APADURA

◀5... Sprouting to success:

“Sa loob ng isang linggo, dalawa hanggang tatlong beses kami gumagawa ng mushroom crackers. Kada isang gawaan, nakakapagproseso kami ng limang kilo ng mushroom crackers na katumbas sa 12 packs. Kapag naibenta lahat, kumikita kami ng humigi’t kumulang PHP 1,800,” she added.

BWGA chairperson Julie G. Diaus shared her experience on selling both the ready-to-eat crackers and pellets at her store in the town market.

“Dahil may pwesto naman ako sa palengke, naisipan ko na ibenta rin doon ang produkto na gawa ng aming samahan. Mabilis naman maubos ang mga crackers at minsan pa nga, ay hinahanap at binabalikan ng mga mamimili,” she stated.

To date, the project was able to produce a total of 18,000 packs of mushroom crackers through the participation of the BWGA. DA-Central Luzon continues to support the BWGA through establishing more market linkages and conducting refinement activities.

“With the support of the Municipal Local Government Unit of Carranglan, Nueva Ecija, we expect that BWGA would grow as a sustainable enterprise through processing mushroom crackers,” project leader Soriano said. ■

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Commercializing VCO in Quezon, strengthening rural women's livelihood

Evelyn H. Juanillo



A group of women, collectively called Cabay Rural Improvement Club (RIC) in the province of Quezon learned to process virgin coconut oil (VCO) through a training coordinated by the Municipal Agriculture Office with the Department of Trade and Industry in 2015.

The Cabay RIC aimed to supply VCO, a natural oil extracted from fresh and mature coconut kernel, in local and export markets. However, they were not able to provide stable supply of VCO in terms of quality and quantity.

During the consultation with the officers and members of the group with DA-Quezon Agricultural Research and Experiment Station (QARES), it was identified that their existing production of VCO

can be enhanced to improve the quality of the product, hence, increase acceptability in the market. Utilization of by-products from producing VCO should also be looked into to reduce waste and provide possible additional income.

Recognizing the need to improve the volume of production, promote, and commercialize the VCO to serve as additional income and utilize waste from production, the DA-QARES implemented a project to strengthen rural women's livelihood through commercialization of VCO.

Funded by the DA-Bureau of Agricultural Research, the project covered provision of POT on virgin oil production such as provision of equipment and initial supply

Dati gumagawa kami ng langis, manual lamang at hindi ito VCO. Umaabot ang aming produksiyon nang kulang sa 10 litro lamang kada araw. Nung kami ay na-train na, ay umaabot kami ng 50 liters o depende sa demand.

MARILYN L. PIPIT, CABAYAN RIC

of packaging materials for the products.

“Ang aming RIC na gumagawa ng VCO ay mapalad na mabigyan ng karagdagan na kagamitan ng DA-QARES gaya ng mga equipment at mga packaging materials gaya ng mga bottles at tinuruan din kami sa paggawa ng label, malaking tulong ito upang mas ma-market ang aming produkto,” narrated by Marilyn L. Pipit, Cabay barangay captain and leader of the RIC.

With the provision of processing and processing-related technologies, the volume of production increased as well as the quality of the products produced.

“Dati gumagawa kami ng langis, manual lamang at hindi ito VCO. Umaabot ang aming produksiyon nang kulang sa 10 litro lamang kada araw. Nung kami ay na-train na, ay umaabot kami ng 50 liters o depende sa demand,” Pipit shared.

“Naibenta namin ang aming produkto ng PhP 120 kada litro. Ngayon, sa tulong ng DA-QARES, napaayos ang aming processing area at nagkaroon ng paglalagakan ng raw materials, subalit malayo pa ito sa appropriate processing facility na required kaya’t madami pa dapat ipaayos,” she added.

As part of the capacity-building and mentoring, about 25 RIC members were given trainings on Good Manufacturing Practices to ensure product quality and safety and VCO soap-making as additional product line from virgin coconut oil. Likewise, around 30 coconut farmers together with the RIC beneficiaries were trained on integrating native chicken to increase the productivity of coconut areas.

“Kung ire-rate ng 1 to 10 ang aming kaalaman at natutunan, tungkol sa teknolohiya sa paggawa ng VCO, ngayon ay 8 ang aming rate,” she happily shared.

Like most businesses and agriculture ventures, they were affected by the COVID-19 pandemic.

“Nahirapan kami noong nag-pandemic. Dati talagang malakas, maayos at naging busy ang mga miyembro. Maraming natutulungan gaya ng mga nangunguha ng coconut (raw materials) hanggang sa pagproseso nito,” Pipit shared.

She added that when the pandemic happened, production was controlled and problems occurred until there came a time when they no longer have a market for

their product, referring to the bulk buyer in Quezon who was likewise affected and stopped buying their VCO.

“Mabigat ang responsibilidad, dahil hindi sa lahat ng oras ay may kita, kumukuha ako ng lakas sa aking pamilya at mga kasama sa RIC. Kahit may problema kami ay masaya pa rin,” Pipit ended.

The RIC members did not give up and was able to continue production in small amounts and supply small drugstores in the area with VCO bottled in different sizes. This provided additional source of income for the members.

Nowadays, they are slowly getting back on their feet with the assistance of DA-QARES. They are continuously supplying VCO in the locality and with the help of DA-QARES who is negotiating with bulk buyers, they are looking forward to a brighter future in VCO production. ■

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PHOTOS: RHERMOSO



More than just preparing the pond:

It's reshaping fish spawning and fry rearing practices

Angelo N. Padura

The long wait is over. After a season of breeding and feeding, fisherfolk hope for a good catch of swarming fish as they start dipping their hand scooping nets in the pond water under broad daylight. In just a few moments later, fisherfolk's drained nets do not just show how poor the catch was but how needy the situation is for many of them.

"Dati, sobrang kakaunti ang nasasalop ko na fry mula sa aking dalawang earthen ponds na may laman na mga tilapia breeders," San Nicolas, Batangas tilapia hatchery and nursery farm owner Henry Magsisi recalled.

Despite being one of the top producers of tilapia in the country, fisherfolk, particularly tilapia growers, in the CALABARZON region are confronted with insufficient supply of high quality tilapia fry and fingerlings.

Two decades of fish farming

Henry M. Magsisi, a fisherfolk for the past 20 years, tends a tilapia hatchery and nursery farm with several ponds devoted for fry production. Aside from producing tilapia fry and fingerlings, he earns a living by managing a backyard piggery, and running a *sari-sari* store and several rental videoke units.

Without knowing the pros and cons of his practices, he simply combines male and female tilapia breeders in a single pond. In doing so, he used to collect 600,000 to 700,000 tilapia fry in every production cycle, five cycles in a year. After utilizing his ponds for five months, he allows it to rest for a month or two by draining water from it — allowing the soil to replenish nutrients

and minerals by itself. To prepare the pond for a new cycle, he also depended on the use of chemical fertilizers and pesticides in getting rid of harmful insects and reviving soil health.

"Nakasanayan na namin ang mga ganitong pamamaraan dahil wala naman na nagturo sa amin na kung ano ang tama o mali. Basta ang sa amin, nilalaglag lang namin ang breeders tapos ay nilalason ang lupa pagkatapos kumolekta ng mga tilapia fry," Magsisi explained.

Reshaping fish spawning and fry rearing practices

In 2020, DA-National Fisheries Research and Development Institute (NFRDI), through its Freshwater Fisheries Research and Development Center (FFRDC), implemented a project to address inefficient and low production of fry and fingerlings through refinement of site-specific protocols for seed production of tilapia.

DA-NFRDI-FFRDC chief and project leader Dr. Maria Theresa M. Mutia shared the importance of proper methods in rearing and harvesting fry and fingerlings, use of pond fertilizer, and proper water management and pond preparation to increase seed production of tilapia resulting in an increased income for fisherfolk.

"Proper pond preparation, through soil cultivation and use of organic fertilizers and pesticides, promotes the growth of natural food for tilapia and at the same time, eliminates pests and diseases in the pond," explained chief Mutia.

Through the DA-BAR-funded project, fisherfolk-partners were

trained on different packages of technologies (POTs) in tilapia hatchery and nursery in village level farms in Laguna and Batangas, hence its application.

After attending training, Magsisi learned to use organic pesticides such as teaseed and disperse lime in eliminating pests in his pond.

"Sa pamamagitan ng teknolohiya at proyekto ng DA-NFRDI, natutunan ko ang tamang pond preparation. Mahalaga pala ang tamang pagpapahinga ng lupa para bumalik iyong sustansiya niya. Maliban pa roon, epektibo pala ang paggamit ng lime at teaseed para mawala ang mga peste sa lupa at paggamit ng organic fertilizer upang tumubo iyong mga natural na kinakain ng fry," Magsisi shared.

Aside from protocols for hatchery farms, fisherfolk-partners were also trained on how to increase the survival and improve the performance of tilapia fry until they reach a saleable fingerling form in nurseries.

"Kapag dumating ang fry, hinahayaan lang namin ang plastik na may fry sa tubig sa loob ng 10-15 na minuto. Pagkatapos naming buksan ang plastik, hahayaan lang namin iyong fry na lumabas hindi kagaya dati na itinataktak namin," Agaton Holgado, a fisherfolk-partner from Laurel, Batangas, shared.

Catch full nets

Fisherfolk-partners from identified barangays in Laguna and Batangas reported an increase in their tilapia fry and fingerling production after implementing site-specific

protocols introduced by the DA-NFRDI.

“Nadagdagan ang aking produksyon ng tilapia fry. Kung dati ay 600,000 hanggang 700,000 fry, ngayon ay umabot sa 1.2-1.5 milyon ang aking nakokolekta sa bawat cycle sa dalawang nursery ponds,” Magsisi reported.

Holgado shared that survival of tilapia fry in his nursery pond increased significantly due to proper stocking and acclimatization.

“Halos magpantay ang dami ng aming nilaglag na fry sa dami ng fingerlings na aming nakukuha,” he added.

Through the adoption of the POTs on enhanced fingerling production of tilapia, a remarkable 12% increase in production and 22% increase in profit was achieved. Several cooperators were also able to gradually expand their hatchery and nursery farms, renovate houses, and acquire additional livelihood such as poultry and livestock due to the increase in their productivity and income.

“Village level hatcheries and nurseries are important in achieving a continuous supply of food in the community and quality fry and fingerlings for grow-out ponds and cages,” DA-NFRDI executive director Dr. Lilian C. Garcia said.

By improving farm practices of hatchery fishers like Magsisi did, communities approach food security a bit closer. Thus, the supply chain of commodities like tilapia are strengthened toward winning the battle against food insecurity.

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PHOTO: MEGARCES

Agri youth groups lead the way

Rena S. Hermoso



Kaming mga kabataan, kasama ang mga households, ay naturuan ng DA-Cagayan Valley kung paano magtanim ng gulay sa aming mga bakuran at magbinhi ng buto na itatanim sa susunod na cropping.

JHONLY R. CACHO, AGBIAG

Naniniwala kami na 'yong mga seeds na ipinunla ng DA sa mga puso namin ay maha-harvest namin sa future at para sa future generations.

ABRAHAM MACOCO, ASOSASYON NG MAGSAKABATAAN



As the Generation MZ (the collective term for Millennials and Generation Z) starts to dominate the workforce, we are seeing a shift in work preferences and culture. In the Philippines, more and more people from these generations are pursuing careers in lucrative industries such as information technology and food service.

This preference shift is also evident in the aging population of our

farmers and fisherfolk. For years now, DA has been exerting efforts to entice the youth to engage in agriculture and fisheries. Various programs, projects, and initiatives have been made in pursuit of this like the nationwide internship program Mentoring and Attracting Youth in Agribusiness or MAYA and the Infomediary Campaign of the DA-Philippine Rice Research Institute.

This challenge is far from over but there are standout stories of youth finding their passion and pouring their hearts and efforts into the agriculture and fisheries sector.

Youth groups at the forefront

At the height of restrictions in view of the COVID-19 pandemic, two youth groups in Cagayan Valley served as some of the most formidable allies of the DA-Cagayan Valley in ensuring the steady supply

of healthy, safe, and affordable food in their respective communities.

The DA-Cagayan Valley, through the DA-BAR funded project on mass production of quality planting materials of selected lowland and indigenous vegetables, trained youth organizations and household beneficiaries on mass propagation techniques on open pollinated varieties and other indigenous and hybrid vegetables.

They tapped the existing active youth groups, Quirinian Youth in Action (QYA) of Quirino, Isabela and Asosasyon ng MagsaKabataan of Tumauini, Isabela, for this project.

From communal garden for sustenance to income generation

QYA traces its roots to Project AGBIAG or Aking Gulayan sa Bakuran ay lingatan at Aalagaan para sa Ginintuang Kinabukasan. Founder Jhonly R. Cacho and nine other youth started tilling a communal garden in front of a church in Quirino, Isabela to produce their own food during the series of lockdowns.

Their barangay was eventually adopted by the DA-Cagayan Valley Research Center (CVRC) under the Adopt-a-Barangay program of the DA Plant Plant Plant program. This led to their partnership with DA-CVRC in the said DA-BAR funded project.

“Kaming mga kabataan, kasama ang mga households, ay naturuan ng DA-Cagayan Valley kung paano magtanim ng gulay sa aming mga bakuran at magbinhi ng buto na itatanim sa susunod na cropping. Ang aming grupo ay nakabuo ng isang demonstration farm na natamnan ng iba’t ibang klase ng gulay at naka-establish ng isang greenhouse na ginagamit sa seedling production. Natuto rin kami kung paano gamitin ang mga biological control agents sa aming garden, imbis na gumamit ng mga synthetic na kemikal,” shared Cacho.

The harvested vegetables from their backyard gardens and communal farm served as food source for the community during the lockdowns. They were also able to sell the surplus to neighbors.

“Sa 90-100kg na iba’t ibang gulay na ani mula sa maliit na backyard garden, kumita kami ng mahigit kumulang na Php 1,000 sa isang cropping. Nagkaroon din kami ng produksyon ng seeds at seedlings na binibigay sa mga households o sa mga farmers na gusto ring magtanim sa kanilang bakuran at bukid. Kumikita rin kami mula sa mga naibebentang seeds at seedlings,” he added.

QYA engaged around 100 beneficiaries who learned to produce their own seeds to be used for the succeeding cropping seasons. Cacho also noted that they learned how to sustain the activities initiated through the project, as well as the importance of engaging the youth in agriculture and the role it plays in realizing the value of food production.

Youth helping themselves and their communities

The Asosasyon ng MagsaKabataan, meanwhile, was established to help fellow youth and contribute to the attainment of food self-sufficiency in their community. They have 40 members composed of school youth, out-of-school youth, and young professionals.

A good samaritan lent the association a piece of idle land where they established their vegetable communal garden, made possible through the project. With their eagerness and commitment, they were able to acquire a 1,500 square meter land where they will expand and continue the activities introduced through the project.

Like the other beneficiaries of the project, they were also trained on mass production of quality planting materials of selected lowland and

indigenous vegetables and seed saving technology.

“Nagpapasalamat kami sa [DA] katuwang ang [DA-CVRC] at [DA-BAR] dahil sa mga teknolohiyang ibinaba sa amin, mga proyekto at training, na siyang tumulong upang ma-develop namin ‘yong skills namin sa larangan ng agrikultura,” said Abraham Macoco, former president of the Asosasyon ng MagsaKabataan.

He added, *“Kami ngayon ay kumikita na. Iyong kita namin ay nagagamit namin sa pang-araw-araw na gastusin lalo na sa pagbebenta ng mga produce namin na quality planting materials, tulad ng seeds and seedlings, ng mga iba’t ibang gulay. Ang mga bunga ng aming pananim [ay] naibebenta namin sa mga constituents namin at sa karatig na barangay.”*

The association practices Good Agricultural Practices, as well as organic practices in their communal and backyard gardens. They are also producing their own natural farm inputs such as vermicast and organic concoctions, which are also distributed and sold to their constituents.

Through the income generated from this, they were able to support 20 scholars who received stipends every semester. Ten of these scholars recently graduated from their respective bachelor’s degrees.

“Nakikita namin na ang gobyerno natin, ang [DA] ay nagiging katuwang namin sa pagbibigay nila ng proyekto, ay natutulungan din namin ang aming kapwa kabataan. Naniniwala kami na ‘yong mga seeds na ipinunla ng DA sa mga puso namin ay maha-harvest namin sa future at para sa future generations,” ended Macoco. ■

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Building capacities of communities through household EL gardens

Lea B. Calmada



Olivia E. Sancha, 25 years old, a full-time housewife, and a mother of two, resides in DMCI Gawad Kalinga HOA Village, La Huerta Extension, Parañaque. As a mother without a job and with her husband solely working, the daily food needs of her family are a major concern for her.

But when she underwent training in edible landscaping (EL) garden, everything changed. Upon learning basic skills in planting through EL garden, the vegetables they used to buy in the market can now be harvested easily in their garden. She also learned the value of their house's beautification through this technology.

Sancha was one of the beneficiaries of the edible landscaping training conducted by the Institute of Crop Science, College of Agriculture and Food Science-University of the Philippines Los Baños (UPLB) in collaboration with the Department of Agriculture, Local Government

Units, and non-government organizations.

Through funding by the DA-BAR, UPLB implemented a project geared towards introducing EL among households or neighborhoods in the urban (and semi-urban) context to build the capacity of the communities.

UPLB introduced the 4Ks — *kagandahan* (aesthetics), *kasapatan* (sufficiency), *kalusugan* (health), and *kapakinabangan* (welfare) with the tagline, “No Filipino will go hungry if they know how to plant.”

“As the saying goes, ‘*Kapag may itinanim, may aanihin*,’ because of edible landscaping, we learned how to plant. It feels good and satisfying when you see the fruits of your labor,” Sancha said.

“The front side of our house has become cleaner and greener

through edible landscaping. Now, we have our source of vegetables for everyday needs because of the seeds and plants provided to us,” she added.

According to her, her family now no longer needs to buy vegetables outside because they produce their own, such as *pechay*, *talong*, *mustasa* (mustard), lettuce, okra, tomato, *sili* (chili), and *alugbati* (Malabar spinach). Some are not mere plants but also vegetables and alternative herbal medicine.

Another good thing about the EL garden is that Sancha is able to share their excess harvests with their neighbors.

Sancha shared also some tips on how to make the EL garden successful.

“The EL garden would not be successful and sustainable without proper care and maintenance. You

need to water the plants and apply fertilizer and pesticides. Bagging and pruning are just two of the most common types of practices learned in edible landscaping,” she explained.

She was also happy to share that their GKV Homeowners Association in Brgy. La Huerta, Paranaque City has been chosen as the ideal location for having each adjacent home in one street to undergo edible landscaping.

The establishment of EL Garden in the 15 households was in support of the DA’s Plant, Plant, Plant Program, which promotes the concept of square-foot gardening of edible crops such as lady fingers, bitter melon, and eggplant. The construction also serves to be the main intervention of the project in bringing about the desired outcome of food-self-sufficient urban Filipino home gardens.

To ensure success of the establishment of household EL gardens in the Gawad Kalinga HOA in Lahuerta Paranaque, the UPLB EL Team conducted several activities, namely, a) the pre-implementation

phase including site identification (situational analysis), household profiling and community-based mapping, b) the implementation phase including capacity building (training, provision of technical assistance in the planning, and designing the garden) and establishment of edible gardens, and c) the monitoring and evaluation phase that includes the maintenance activities, monitoring and evaluation, and impact assessment.

The UPLB EL Team also conducted a refresher workshop/seminar on edible landscaping maintenance practices. This was made to remind the beneficiaries in La Huerta of the important task of maintaining the beauty and functionality of the EL gardens. The content of the workshop includes the production of organic concoctions such as fermented plant juice, fermented fruit juice, and oriental herbal nutrients, which are equally distributed to the participants for their own use.

It is also important to note that UPLB EL Team coordinated with the LGU which is valuable to ensure the

sustainability of the gardens. The LGU provided the training, planting materials, hardscapes, and other technical assistance needed by the participants.

The LGU also provided the ongoing construction of a small greenhouse or community nursery that solely focuses on preparing and producing the seedlings/planting materials to be used by each of the participating households.

Building capacities of communities through household EL gardens are encouraged to be learned and implemented in every household-addressing the lack of basic and nutritious foods that can easily be harvested in front of their house. The improvement of every community (urban and semi-urban) must begin at home through learning and practicing the household EL gardens. ■

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As the saying goes, “*Kapag may itinanim, may aanihin,*” because of edible landscaping, we learned how to plant. It feels good and satisfying when you see the fruits of your labor.

OLIVIA E. SANCHA, PARAÑAQUE CITY



PHOTOS: RBERNARDO

Start-up Mushroom Crackers business



The DA-Central Luzon Integrated Agricultural Research Center for Upland Development upscaled the production of oyster mushroom (*Pleurotus ostreatus*) to serve as an additional source of income to members of the Binbin Women Gardeners' Association and other vegetable-mushroom farmers in Carranglan, Nueva Ecija. By using mature and low-cost technology in processing oyster mushrooms, vegetable farmers can augment their income by venturing into mushroom crackers production. Look at the profitability analysis of the processing technology shown below.

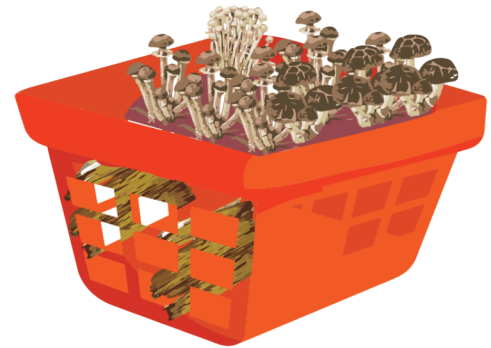
Product	Investment	Suggested Retail Price	Net Profit	ROI (%)
Fried Mushroom Crackers 50g	32.50	80.00	47.50	146.15
Unfried Mushroom Crackers (pellet) weighing 100g	38.00	75.00	37.00	97.37
Unfried Mushroom Crackers (pellet) weighing 250g	93.75	210.00	116.26	124.00



Straw mushroom in a basket

FINANCIAL VIABILITY

The DA-Cagayan Valley-Regional Crop Protection Center outscaled the straw mushroom (*Volvariella volvocea*) cultivation in plastic baskets in Isabela and Cagayan during the series of lockdowns brought by the COVID-19 pandemic. This technology is suitable for people, especially farmers and fisherfolk, who want to earn extra income but have limited space. Below is the profitability analysis of three-basket straw mushroom cultivation (one cycle or 15 days):



ITEM	WORKDAY	AMOUNT (PhP)	
		Cycle 1	Cycle 2
A. LABOR COST			
Hauling of Substrate (Banana Leaves/Rice Straw)	1	250	250
Soaking of Substrate (Banana Leaves/Rice Straw)			
Inoculation/Planting of Prepared Substrate			
Sub-Total		250	250
B. MATERIAL COST			
	Quantity	Unit Price	Amount (PhP)
Laundry Basket	3pcs	25.00	75.00
Plastic Bags (36x60)	3pcs	10.00	30.00
Rice bran	1kg	7.00	7.00
Carbonized Rice Hull	6kg	1.50	9.00
Agricultural Lime	250g	3.25	3.25
Spawn	3 packs	35.00	105.00
Sub-Total			229.25
PRODUCTION COST			479.25
(YIELD IN 3 BASKET) GROSS INCOME	1.5kg	400.00/kg	600
NET INCOME			120.75
ROI (%)			25.19

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Prepared by **Lino Norman D. Reyes**



Building capacities of communities through household EL gardens

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PHOTO: AVELASCO

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