

RESEARCH FOR DEVELOPMENT BARDIGEST

The official magazine of the Department of Agriculture-Bureau of Agricultural Research



UTILIZING CAGAYAN VALLEY'S *Black Gold* AS THE ULTIMATE CASH CROP

OCTOBER-DECEMBER 2021
VOLUME 23 ISSUE NO. 4

ISSN 1655-3934

CONTENTS

R4D NOTES

- 3 Empowering farmers through technology adoption and active community participation
- 4 Improving rice productivity through community-based research
- 6 Empowering the farmers together
- 8 Enhanced corn production in sloping areas
- 10 Targeting arrowroot production to value-added products
- 12 Integrated farming systems: Involving farmers, community
- 14 One step safe closer: An instrument to pesticide residue-safe vegetable production
- 16 Utilizing Cagayan Valley's Black Gold as the Ultimate Cash Crop
- 18 Package of technology addresses the problems of farmers in Enrique Villanueva, Siquijor
- 20 CPAR empowers lady ARB, changes her life

EXPERT'S CORNER

- 22 The WE R2gether in Agri-research

INFOGRAPHICS

- 26 Community-based Participatory Action Research on Rainfed Rice-based System in San Miguel, Iloilo

- 28 Getting to know Dr. Junel B. Soriano, the new DA-BAR director

INFOGRAPHICS

- 30 Honey-based Community Enterprise Development in Lanao del Norte
- 32 Let's hear our CPAR-partner farmers!

ABOUT THE COVER

Mungbean is one of the most important field grain legumes grown in the Philippines. Cagayan Valley is one of the top producing regions for the said crop, contributing 20-25 percent of the country's total production from 2012-2019.

With the economic importance of the said crop, the Department of Agriculture-Cagayan Valley Research Center (DA-CVRC) introduced package of technologies that adheres to the Good Agricultural Practices to farmers in Cabatuan, Isabela. Through this participatory research, farm productivity and profitability have increased.



COVER PHOTO COURTESY OF VJCALDERON/DA-CVRC




EDITORIAL BOARD

EDITOR	Ma. Eloisa H. Aquino
CONSULTING EDITORS	Salvacion M. Ritual Maria Elena M. Garces
WRITERS	Ma. Eloisa H. Aquino Maria Elena M. Garces Rena S. Hermoso Evelyn H. Juanillo Salvacion M. Ritual Mara Shyn M. Valdeabella
CONTRIBUTORS	Amavel A. Velasco Geline Nicole A. Morillo Mark Ariel L. Agresor Rose Mary G. Aquino Vanessa Joy F. Calderon Michael F. Dabuet Dr. Fabio G. Enriquez Camille O. Francisco Rufelie S. Gula Mary Jane B. Ibarra
INFOGRAPHICS	Ryan Joseph M. Abrigo Ronjie G. Broñola
DESIGN/LAYOUT	Rena S. Hermoso
CIRCULATION	Ryan Joseph M. Abrigo Ricardo G. Bernardo Lyn D. Pardilla
ADVISERS	Dr. Junel B. Soriano Joell H. Lales

BAR R4D DIGEST is the quarterly magazine of the Department of Agriculture-Bureau of Agricultural Research.

This magazine contains feature stories on the latest technologies and breakthroughs in agriculture and fishery research for development (R4D) based on the studies and researches conducted by the member-institutions of the National Research & Development System for Agriculture and Fisheries.

The bureau was established to lead and coordinate the agriculture and fisheries R4D in the country.

The editorial board welcomes comments and suggestions from readers. Reach us via our email kmisd@bar.gov.ph and our social media accounts    [DABAROfficial](#).

© DA-Bureau of Agricultural Research 2021

This magazine is copyrighted by the Department of Agriculture-Bureau of Agricultural Research. No parts of this publication may be reproduced and distributed without the permission from the management and proper attributions from its original source.



Agricultural Magazine of the Year
2007 Binhi Awards

Best News Magazine
2003 Gawad Oscar Florendo

Empowering farmers through technology adoption and active community participation

by Dr. Junel B. Soriano

The Community-based Participatory Action Research (CPAR) program of the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) aims for increased productivity and income of farming and fishing communities by accelerating transfer of relevant technologies.

On the premise that there are already available technologies generated by the different research institutions, the CPAR approach undergoes verification and adaptability trials of mature technologies to come up with location specific interventions that are suitable based on agro-ecological conditions of the area. Utilizing these interventions, the program also develops strategies for effective integration of support services toward enterprise development and commercialization.

Notably, the CPAR framework begins with the community's issues or problems, proposed actions or strategies then translate these into action research that is community-based and engaged.

CPAR serves as an entry point to technology commercialization or upscaling since this approach focuses on technology demonstration and assessment of suitable technologies with market potential as important aspect.

This program represents a break from “business as usual” for DA-BAR, as we seek to use research not only to solve problem through science, but more importantly as an approach to engage and empower people who depend on agriculture and fisheries for livelihood. While we want to improve their livelihood and income, we believe opportunities for transformative change will emerge that can potentially impact or bring lasting benefit to the farmers and fishers.

We, at DA-BAR, envisions to learn from our implementation of the program; to understand better how research can leverage developmental outcomes and impact.

Through the years, the bureau has documented a number of CPAR projects that have yielded gains and impacts to the beneficiaries and adopters. Some of the products out of CPAR were already into upscaling and/or commercialization. Apart from this, several successful projects were turned over to the local government units with the program being considered for mainstreaming into their local development plan. Some projects were being successfully managed by the farmers' cooperatives and associations.

In line with the bureau's Research to Policy for Development and Extension (R2P4DE) strategies, utilization of knowledge and technologies generated from research will be vigorously pursued. The CPAR approach—as a platform for technology assessment towards upscaling and commercialization—will be given attention. All successful CPAR projects will be sustained, replicated, and scaled leading to development of enterprise and improvement of agri-fisheries related industries, emphasizing technology transfer, adoption, and utilization.

This issue of the BAR R4D Digest focuses on participatory approach which is especially timely, as we are still in a pandemic whose impact on human health and global economy have already proven catastrophic. Such that, empowering our farmers and fishers with the right tools and knowledge will make them more resilient amidst the challenges brought about by this pandemic. And this is what CPAR is all about.

This issue features some of the successful CPAR projects complemented by articles and stories from the regions that illustrate research “in action.” Ensuring that through R4D, the farmers and fishers can participate in and contribute to the improvement of the agriculture and fishery sector – but more so their families and communities. ■



Improving rice productivity through community-based research

by Rena S. Hermoso

Drive north for approximately two and a half to three hours from the bustling city of Iloilo and you will reach the municipality of Concepcion, an up and coming tourist destination that boasts of white beaches and crystal-clear waters minus the crowd.

If sea is not your thing, sail further northeast for about an hour and you will arrive at Pan de Azucar Island. Still part of the municipality, the island hosts Mt. Manaphag, its popular landmark which is also a hiking destination among tourists.

Like how the tourists enjoy both sea and land in Concepcion, the locals surely benefit from these natural geographic features. Inevitably, fishing and farming is the municipality's main source of income. Sixty-seven percent of its total land area is dedicated to farming with rice as its primary agricultural product. Out of the

1,426.59 hectares of land allotted to rice, 30 percent is irrigated while the remaining 70 percent is rainfed.

In Barangays Tambaliza and Talotuan, farmers plant rice twice a year and grow vegetables. The problem with monocropping is that pests that infested the area and diseases that infected the plants will most probably thrive after every cropping because the host plant is present all throughout. Another risk of this farming practice is the depletion of soil nutrients.

True enough, during the participatory rural appraisal of the project implemented by the Research Division of the Department of Agriculture-Western Visayas, the farmer-partners and research team from the region have identified the following problems: lack of good quality seeds, capital, farm machineries, and irrigation, as well as the infestation of pests and occurrence of diseases.

To enhance the productivity and profitability of the farmers in the two barangays, a project was implemented by the research team from DA-Western Visayas. Twenty model farms were established to showcase the rice-mungbean + vegetables cropping system and the additional squash and string beans production.

Throughout the course of the project, the farmer partners underwent various trainings on PalayCheck system, Rice Crop Manager (RCM), squash and string bean production, preparation and utilization of different organic concoction, community-based *palay* seed production, and simple farm bookkeeping and accounting. They also attended two farmers' field days and one field tour.

PalayCheck system developed by DA-Philippine Rice Research Institute (PhilRice) is a rice integrated crop management

system that encourages farmers to manage their crop according to targets by measuring crop performance and analyzing results.

RCM developed by DA-PhilRice and the International Rice Research Institute provides crop and nutrient management guidelines customized to the needs of an individual rice farmer. It contains a set of science-based principles and formulas for calculating field-specific nutrient and crop management.

“Squash and mungbean were the most preferred additional crop by the farmers among other [options]” owing to the location of their place, an island, which means that transportation of produce is a challenge. Both vegetables also have longer shelf life, so farmers can still sell it weeks after harvest. The farmers also saw the opportunity to sell squash to

rural women associations in the province who operate a squash canton noodles and squash cake processing center.

“[The] introduction of rice-mungbean + vegetables cropping pattern [and] capability building activities conducted had a significant effect on the practices of the farmers in the area,” said project leader and science research specialist William P. Opher, Jr.

The introduced cropping yielded a PhP 29,655.95 income, which is 38.73 percent higher than the PhP 18,170.66 income of the existing farmers’ practice of rice monocropping.

After the completion of the project in 2019, the research team turned over its management to the local government unit (LGU) and the farmers’ association. The team continuously monitors the

project to determine the increase in the adoption of the improved technologies, as well as provides updates on new technologies of the rainfed farming system.

“Close monitoring of the project was done by the farmers association with the direct supervision of the LGU,” said Opher.

The farmers’ association also pools together the fresh produce of its members, so that it can be sold in bulk and at a higher price. ■

For more information:
William P. Opher, Jr.
Science Research Specialist I
Research, Development,
and Extension Division
DA-Western Visayas
Hamungaya, Buntatala,
Jaro, Iloilo City
(033) 320 9469
0950 996 7554



Empowering the farmers together

by Rena S. Hermoso

“Nakatulong sa pagbebenta ng gulay namin, nawala na iyong middleman. Sila na ang kumukuha sa amin ng gulay,” shared Ma. Fe Pojas, Better Days Farm owner.

Hailing from San Luis, Batangas, Pojas was among the 20 high value crops farmers engaged in the participatory research on Good Agricultural Practices (GAP)-based production technologies for high value vegetables.

The interference of middlemen in the supply chain of agricultural commodities has been a perennial challenge that adversely affects both growers and consumers. Most smallholder farmers resort to selling their produce at a cheap price to middlemen. This inevitably leads to higher markup; thus consumers are forced to pay a premium for a produce bought at a low price.

Strengthening the capacity of farmers’ groups and establishing farm-to-market linkages and networks were seen as some of the solutions to address this problem. And, one of the programs supported by the DA-Bureau of Agricultural Research specifically incorporates these at its core—Community-based Participatory Action Research (CPAR).

DA-Southern Tagalog Integrated Agricultural Research Center (STIARC), with funding support from the bureau, implemented the CPAR on GAP-based production technologies for high value vegetables. The very project that Pojas and 19 other high value crops farmers engaged in.

“Ang kaibahan nito sa ibang proyekto na pinapatupad namin, ito ay participative. Ibig sabihin ang mga magsasaka o farmer-cooperators ay kaakibat namin

sa pag-aaral at pagpapatupad ng proyekto,” explained project leader Virgilia Arellano, senior science research specialist.

Guided by the expertise of the research team from DA-STIARC, the farmers themselves raised and identified the problems and constraints during the participatory rural appraisal. They identified that the lack of machineries like tractors for land preparation and inadequate supply of good seeds and fertilizers affect their farm productivity. On top of that, they also lack the knowledge on identifying and managing pests and diseases and food processing. They also lack alternative sources of income.

Through the project, the farmer-cooperators were trained on soil sampling, integrated nutrient management, integrated pest management, vermicomposting,



organic agriculture production, and organic concoctions preparation. They also participated in seminars on GAP, vegetable food processing cum good manufacturing practices, and business agri-entrepreneurship.

In order to boost farm productivity and increase their income, the research team introduced the GAP-based vegetable production. Each farmer allotted 2,000 square meters of land that was planted with tomato, eggplant, sitao, hot pepper, green chili, bitter melon, beans, okra, and sponge gourd.

To augment farmers' income, the research team introduced vermicomposting as source of organic fertilizers, as well as vegetable food processing (i.e. powdered chili, chili paste, tomato paste) to maximize the surplus of vegetables.

The average net income of farmers obtained through the project was PhP 109,005.80 as opposed to the PhP 96,408 income using the traditional farming system. The recorded yield was valued at 76 percent increase, which exceeded the project's targets of 20 percent increase.

To complement this, the research team also assisted the farmers on their application for the Philippine GAP certification. With a validity period of two years, this certificate signifies that the food produced by the farms are safe to eat and of good quality. Adherence to PhilGAP not only protects the consumers but also facilitates market access of food produced by smallhold farmers.



“Alam natin ang kahalagahan ng GAP certification sapagkat nagkakaroon ng maraming options and mga farmers sa pagdaldalhan ng gulay, mas mataas na presyo, at masisiguro natin na dekalidad at ligtas kainin ang mga produce,” explained Rinkoh Hernandez, San Luis, Batangas municipal agriculturist.

Hernandez proudly shared, *“So far tayo ang pinakamarami sa CALABARZON. Maraming mga farmers din ang nahikayat na magpa-certify ng GAP in the future.”*

All 20 of the farmer-cooperators were able to secure a PhilGAP certification from the DA-Bureau of Plant Industry with the assistance from the San Luis' Office of the Municipal Agriculturist and DA-STIARC.

“Ang bayan ng San Luis ay nagdeliver siyempre sa local market nito. Doon kami nagsimula. Pinalakas muna namin iyong pagdadala ng mga produkto nila sa lokal na merkado,” Hernandez said.

He added, *“Iyong San Luis Farmers Association ay nagdeliver sa*

Rustan's Supercenters na ngayon ay bahagi na ng Robinson's Supermarket. Ang Balagtasin Farmers Association, sampu sa kanilang mga miyembro ay GAP certified din. Sila naman ay accredited supplier sa Jollibee Foods Corporation.”

He also mentioned that the Office of the Municipal Agriculturist continues to link the farmers to other institutional buyers. The farmers also sell their vegetables and native pork products at TienDA and KADIWA stores.

After the project's implementation, it will be turned over to the Local Government Unit through the Office of the Municipal Agriculturist. The research team assured both parties that technical assistance will still be given. ■

For more information:
Virgilia D. Arellano
Senior Science Research Specialist
Department of Agriculture-
Southern Tagalog Integrated
Agricultural Research Center
Lipa City, Batangas
(043) 756 4962
research@calabarzon.da.gov.ph

Enhanced corn production in sloping areas

by Maria Elena M. Garces



The mountainous topography of Barangays Divisoria Sur and Divisoria Norte in Madella, Quirino, with slope ranges of 18 and 30 percent, respectively, have a corn production area of 249.35 hectares. In pursuit of higher production, and thereby income, corn farmers expanded farming even in sloping areas that are vulnerable to soil erosion.

It was reported that soil erosion contributes to loss of soil fertility levels of nitrogen, phosphorus, and potassium, and thus declining crop yield and reducing cropland for food production. This means low income for the farmers.

With an average farm area of one and quarter hectare per farmer, corn farming is the major source of income of the 199 farmers in the sites. Having an average net income of PhP 5,411.50 per hectare during

wet season and PhP 8,161.50 per hectare during dry season is not enough to support a household of four members.

The project titled, Community-based Participatory Action Research on Sustainable Corn Production in Sloping Areas (SCoPSA), of the Department of Agriculture (DA)-Cagayan Valley introduced three technologies to corn farmers in hilly areas to improve farming system/pattern to optimize moisture availability and reduce soil degradation in sloping areas.

Technology interventions

Two of the introduced interventions of the SCoPSA are the control of soil erosion in sloping areas, and increasing yield through crop diversification/multiple cropping or contour farming and planting of hedgerows.

Hedgerow crops planted were 600 bananas, 617 citrus, 29,000 pineapples, and 38 kilograms pigeon pea seeds. These hedgerow crops have market demands. While citrus can withstand strong winds, pigeon pea improves soil fertility.

DA-Cagayan Valley confirmed in their report that contour hedgerow farming practices served as labor-saving measure to conserve soil and that, over time, can improve yield of up to 15 percent compared with conventional practices.

Double-row planting technology and the use of jabber were also introduced on corn production with planting distance of 80 by 30 centimeters between furrows and 20 centimeters between hills increasing plant population to 90,910 plants per hectare from the 53,333 plants per hectare with planting distance of 70 to 75

centimeter between furrows and 25 centimeters between hills.

This planting method provided good aeration and sunlight penetration while ensuring uniform depth and distance of planting, and better seed germination. Use of inoculant and appropriate fertilizer recommendation based on soil analysis were also introduced ensuring increased production.

Strengthening capacity of corn farmers on introduced technologies

Hands-on trainings on the different CPAR interventions were conducted to enhance skills and knowledge of farmers so as to ensure a sustainable transfer of technology to the farmer cooperators and adopters before the establishment of the project.

Farmer-cooperators learned to use the A-frame to determine the contour lines which will establish the hedgerows that would minimize soil erosion and improve water retention capacity of the soil.

Method demonstration on double row corn planting technology and the use of jabber were done to guide farmers in establishing their sites.

The farmers were also trained to utilize agricultural waste materials like corn husks, cobs, and banana leaves as substrate for mushroom,

vermicomposting, and vegetable seedlings production for agri-entrepreneurial activities.

Technology dissemination

The different SCoPSA technologies were widely disseminated throughout the region through conduct of field days—attended by 312 farmers from different barangays in Maddela and Nagtipuna, Quirino and various government agencies.

The Regional Technology Forum at the DA-Quirino Experimental Station also convened farmers from different municipalities in Quirino.

Technologies were also disseminated and aired in DWDA 105.3 Mhz FM radio program, Agri-Research, every Thursday, and featured in agriculture magazine.

Further, the LGU-barangay partners through the municipal agriculturist endorsed to the mayor the creation of an ordinance institutionalizing SCoPSA as farming technology and become part of farming systems of corn farmers in sloping areas. The ordinance was approved on 30 September 2019.

Technology adoption

These CPAR technologies were showcased in the eight farmer cooperators' farms as CPAR model farms demonstrating the different interventions in their 7.36 hectares farm. From 2017

until 2019, out of the 72 adopters of the CPAR technologies covering 81.50 hectares, 31 are full adopters of SCoPSA with an area of 32.29 hectares and 41 are partial adopters (who considered double row planting and the use of jabber in planting) with an area of 49.21 hectares. Moreover, there are still 64 percent of farmers as expansion of the CPAR interventions from the two sites.

Six months after project completion, there were nine farmer adopters—five in Progreso, Aglipay and four in various barangays in Madella— of SCoPSA with a total area of nine hectares, including 17 farmers tilling 33.29 hectares from LGU Nagtipunan, who considered the double row technology.

These technology interventions through CPAR approach resulted to enhanced productivity and income, and sustainable land use in sloping areas specially to smallhold corn farmers in the two barangays in Madella, Quirino, which gained popularity and adoption by farmers in nearby towns with hilly farming areas. 📌

For more information:

Lovelyn A. Gaspar
OIC-Chief, Research Division
Department of Agriculture-
Cagayan Valley
Tuguegarao City, Cagayan
(078) 304 0205 | 304 0479
research.rfo2@da.gov.ph

Farmer cooperators learned to use the A-frame to determine the contour lines which will establish the hedgerows that would minimize soil erosion and improve water retention capacity of the soil.



Targeting arrowroot production to value-added products

by Ma. Eloisa H. Aquino



PHOTOS COURTESY OF DA-CALABARZON

When they started in 2012, their initial production yield was less than 200 kilograms which then gradually increased over the years, reaching its peak in 2019-2020 with 1,700 kilograms of processed arrowroot starch from 17 tons of tubers.

Production of arrowroot is among the sources of livelihood of farmers in the provinces of Quezon and Laguna. From growing arrowroot, farmers turned this as a viable enterprise by processing it into flour or starch then turning it into arrowroot-based products.

As Catanauan, Quezon became the source of arrowroot flour in CALABARZON, the Department of Agriculture-CALABARZON conducted a research titled, Community-based Participatory Action Research (CPAR) on improved arrowroot production technologies and enhancement of the arrowroot starch and flour in Catanauan, Quezon. This is to further improve the production of arrowroot tubers, hence, the marketability of arrowroot starch and flour for value-added products.

The project team not only limited themselves in providing the technical support to its direct beneficiaries—the 20 farmer-cooperators in Matandang Sabang Silangan and Matandang Sabang Kanluran also gained adopters.

Turning the fate of adopters

Through participations in exhibits and trade shows led by then project leader Rosemarie B. Olfato, a family of *uraro* processors crossed path with the group in 2012.

The mother and son hail from Liliw, Laguna that is also famous for *uraro* products as *pasalubong* to shoes and slippers buyers.

Norma G. Cordoves, 74, and her son, Norman John, 37, met Olfato when the latter served as a resource speaker in one of the trade shows presenting arrowroot production technologies.

Upon listening to Olfato's presentation, they expressed interest to plant and cultivate arrowroot.

The Cordoves' area became one of the demonstration farms established in Liliw, Nagcarlan, Rizal and San Pablo, Laguna.

"Ang natutunan namin sa pagiging demo farm ay napakahalaga sapagkat na-guide kami sa aming pagsisimula," Norman said.

They also did a lot of trial and error to make planting more sustainable and cost efficient.

"Napakalaki po ng kanyang [Olfato] naiambag sa aming journey sa paguuraro at nabibigyan ng advices kapag nakaka-encounter kami ng problema," he added.

More than just technical support, they also acknowledged the provided inputs like initial planting materials, fertilizers, and presser.

All of these contributed in the enhanced arrowroot production cycle that includes land preparation, planting, weeding, fertilization, hilling up, maintenance weeding to harvesting.

When they started in 2012, their initial production yield was less than 200 kilograms which then gradually increased over the years, reaching its peak in 2019-2020 with 1,700 kilograms of processed arrowroot starch from 17 tons of tubers.

With a *pasalubong* store in Liliw, Laguna offering arrowroot cookies, the production and cultivation of arrowroot helped the family to have a continuous and sustainable supply of arrowroot starch for their products.

"Mula sa maliit na processing area, mayro'n na po kaming mas malaki 100 square meters na processing area ng arrowroot starch," Norma said.

For the community, they were able to create employment opportunities especially during the time of pandemic wherein unemployed persons assisted in harvesting arrowroot.

From the three hectares farm area, they are now cultivating a six hectare arrowroot farm area with 1.5 hectare allotted for arrowroot production. Their farm also became a Learning Site of DA-Agricultural Training Institute in 2018.

Turning experiences to tips to plans

When asked on their advice for those who want to plant arrowroot, Norman said, *"Dapat po talaga ay mayroon siyang value adding na gagawin, hindi dapat magtapos sa pagtatanim at paggawa ng powder. Dapat may kasunod pa dahil baka 'di magiging sustainable dahil sa laki ng labor cost at nangangailangan ng maayos na pag-supervise para sa maayos na production at processing,"*

With eight-year experience in production and processing arrowroot, they plan to mechanize the harvesting part of the production.

"We plan to make our powder processing to be more efficient and integrated," he said.

"We plan to make our farm 'Cordoves Integrated Educational and Leisure Farm'- CIEL FARM, an agro-tourism destination," Norma ended. ■

INTEGRATED FARMING SYSTEMS: INVOLVING FARMERS, COMMUNITY

by Ma. Eloisa H. Aquino and Mark Ariel L. Agresor



PHOTOS COURTESY OF MAAGRESOR/DA-ILOCOS REGION



Rice is the country's staple crop—making it present on almost every plate on the table. Thus, farmers, as one of the key players, also yearn for a sustainable supply for the farmers.

But rice-based farming communities in Ilocos Region, in the past, experienced problems and constraints on low yield due to high production cost, limited irrigation facilities, low-technical know-how compounded with high production cost resulting to limited source of farming capital and low adoption

of technologies and eventually, low income.

These problems opened the minds of farmers to act for their betterment. The involvement of the community from assessment, planning, implementation including monitoring and evaluation made them realize the value of information-based decision making.

The project titled, Community-based Participatory Action Research (CPAR) on Rice +

Wingedbean-Yellow, White Corn + Cattle fattening production in Batac City, Ilocos Norte, implemented by the Department of Agriculture-Ilocos Region is a testament that through community participation from assessment to monitoring and evaluation, farmers are empowered towards community driven agricultural development—reflective from implementing, managing, and capacitating others.

Through community-based participatory approach, rice, wingedbean, corn, and cattle

farmers, and other stakeholders in the region identified location-specific technologies and support interventions that are responsive to the existing farming needs to a specific agro-climatic condition. These lead to making better decisions, analysis of problems, and working together as a team.

Technologies introduced include: 1) integrated nutrient management, 2) integrated pest management, and 3) farm waste management for crops. For cattle, technologies covered were: 1) housing, 2) breeds, 3) feeds and feeding management, 4) health management, and 5) waste management.

Hearing from the farmer himself

Faustino R. Guiang, Jr.,

56, of Sumader, Batac City, Ilocos Norte is among the 38 farmer-cooperators of the project who was inspired by and benefitted from the project.

Aside from receiving farm inputs (e.g. seeds, fertilizer), Guiang shared that he participated in the participatory rural appraisal for the needs assessment, planning, including technology testing, among others things—making them, farmers, more involved in the whole cycle.

When asked on the knowledge and learnings gained, Guiang said that they learned modern technologies in planting rice and corn as well as raising cattle.

“Napintas dagiti technology a nasursurok babaen ken CPAR ket inggana ita iso paylang ti sursurutek tay agsasaruno a panagmula ti pagay + pallang-puraw a mais + pakukmegen a baka til las-od ti makatawen. Ti kangrunaan a naimula ti panunot ko ket tay panagaramidan ti feeds ti baka ken panagpilyan ti palukmegen a baka. Itan ket dakami pay ti aglak-lako dagiti ramen a para kanen ti palukmegen a baka (The technology that we have learned in the rice-yellow corn and cattle fattening production was very helpful to us farmers that up to this day, we are still applying the knowledge. As one of the farmer cooperators, one of the things that was imprinted in my mind on cattle fattening is the production of feeds and selection of cattle breeds to be fattened as well as the production of organic fertilizer through vermicomposting),” Guaing shared.

Thirty-eight years into rice and white corn farming, Guiang and his wife Josephine started processing white corn or *chichacorn* in 2015. Three years later, Josephine was among those persuaded to organize the “Sumader Cornic Processors Association” to strengthen the One Barangay, One Product through the help of the Local Government Unit of Batac. The association still processes *chichacorn*.

Various agencies worked together to improve farming in the region. DA-BAR provided financial assistance for the seeds and fertilizer which served as support for technology verification in farmers’ fields.

DA-Ilocos Region, together with the local government unit of Batac City and other government agencies, provided trainings in *chichacorn*

processing as well as provision of processing equipment. The program in the two barangays supported the farmers’ livelihood on *chichacorn* and rice crispies through planting of white corn for cornick and rice for crispies.

Five years after the turnover of the project, Guiang ventured into cattle feed ingredients agri-enterprise using his own machine for milling and utilizing his rice and corn produced selling to agri supplies and cattle farmers.

With the technologies on-hand, his rice production increased by 30 percent (4.55 to 6.5 tons per hectare) resulting to a 30 percent increase in income receiving PhP 117,000 annually.

Aside from the yield and income improvement, Guiang was happy to share that the adopted technologies provided job opportunities for housewives and corn laborers of the community especially during the pandemic.

Wide-scale adoption was done by farmers and their association through sharing of technologies. Also, farmers served as partners and lecturers during farmer field schools and technical briefings.

“Kastoy kuma amin a project, adda planning nga umuna manipod panagmula aginggana mailako ken amin kuma a project ti gobierno ket kasla CPAR, mairaman kami sakbay mangrugi (We hope that all projects are just like CPAR—it involves us ‘community of farmers’ from needs assessment to monitoring and evaluation),” Guiang ended. ■

For more information: **Mark Ariel L. Agresor**

Researcher
Ilocos Norte Research and Experiment Center
DA-Ilocos Region
Tabug Batac City, Ilocos Norte
0918 749 6465



One step safe closer: An instrument to pesticide residue- safe vegetable production

by Mary Jane B. Ibarra

Roxas is known as one of the vegetable-growing municipalities in the province of Isabela. One of its biggest suppliers is Brgy. Simimbaan with a total production area of 58.5 hectares allotted merely to lowland vegetables contributing to 30 percent of the municipality's demand for the said commodity.

Contributing to this success in maintaining a steady and safe supply of vegetables is the conduct of Community-based Participatory Action Research (CPAR) project in the area.

The Department of Agriculture-Bureau of Agricultural Research (DA-BAR) and the DA-Cagayan Valley Research Center in partnership with the Local Government Unit of Roxas implemented the project titled, CPAR on Off-season GAP-based Pinakbet Vegetable Production in Support to the Food Trading Business in Roxas, Isabela.

To address the problems identified in the participatory rural appraisal such as low yield and quality of harvest due to pests, limited varieties, and monocropping practices, the team introduced and promoted improved technologies to enhance yield and income of farmers such as Good Agricultural

Practices (GAP)-based production of off-season vegetables, utilization of improved varieties, application of soil analysis result and improved integrated pest management strategies using biological control agents and some alternative to chemical application.

With the said interventions, most of the farmers adopted the introduced cropping pattern on off-season production of mixed vegetables (eggplant, pepper, tomato, pole sitao, and *ampalaya*) for wet season and hybrid corn intercropped with cowpea for the dry season. This resulted to the increase of income of vegetable farmers of almost 25 percent or Php 81,570.24 in the vicinity.

In addition, organic and inorganic fertilizer and biological control agents such as Earwig, Trichogramma, Trichoderma, and Supernet, as well as Vermihouse, Greenhouse, and Shredder as an additional support in their farming were provided.

Furthermore, the production of pesticide-safe vegetables was also piloted in the area.

The project also paved way into the establishment of an association called Simimbaan Farmers Association consisting of

35 members. The training on GAP on vegetables also contributed to the improvement of their cultural practices, farmer's welfare, and better working conditions. Sixteen farmer-cooperators were already PhilGAP certified given by the DA-Bureau of Plant Industry. Furthermore, the DA-Cagayan Valley-Regulatory Division awarded the certificate of Pesticide Safe Compliance to the Association on 23 August 2019, which is a clear manifestation that the introduced interventions are put to a sustainable utilization by the farmer stakeholders.

To achieve the goal of the project, the team also conducted capacity building on business enterprise which is the development of new products such as Dehydrated Veggie Crunch or Pak-Gulay,





vermicomposting and seedling production as an additional income, and most importantly, to support and sustain the Agricultural Product Trading Center of Roxas, Isabela. Because of the positive results of the technologies and interventions, 85 farmers in the said barangay adopted the technologies in their vegetable production.

Benito Abes is one of the farmer-cooperators of the said project. He has been a farmer for almost 50 years and formerly practicing vegetable farming

without regard to the amount of pesticides used in his farm.

“Sa dati naming practice sa paggugulay ay umaasa kami sa paggamit ng chemical para maka-produce ng maraming ani lalo na sa off-season, ngunit pagdating ng CPAR project na ito sa aming barangay natutunan namin ang paggamit ng mga biological control agents gaya ng Trichogramma, Trichoderma at Earwig kung saan ay na-limit ang paggamit namin ng mga pestisidyo,” Abes explained.

“Dahil dito, tumaas ang aming kita ng 52.27 percent (PhP 134,970) at nabawasan ang aming gastos ng nasa 25.44 percent (PhP 28,500) to 46.61 percent (PhP 52,600). Hindi lamang ‘yon, sigurado pa kaming pesticide safe ang kakainin ng aming pamilya pati na rin ang mga mamimili,” he added.

With all the efforts and interventions that have been made, it has been tested and proven that change is inevitable and needed most specially in the field of agriculture, but no matter how unfamiliar the change maybe, at the end of the day, the most important thing is that it is a change for the better. ■

For more information:
Mary Jane B. Ibarra
Science Research Specialist II
Department of Agriculture
-Cagayan Valley Research Center
San Felipe, City of Ilagan, Isabela
wwibarramaryjane01@gmail.com
0936 160 3472

PHOTO COURTESY OF MJIBARRA/DA-CVRC

Utilizing Cagayan Valley's Black

by Vanessa Joy F. Calderon

Mungbean, popularly known as *munggo* and *balatong* in Cagayan Valley, is one of the most important field grain legumes widely grown in the Philippines. To date, the Cagayan Valley still ranks as one of the top mungbean producers in the region, contributing about 20-25 percent to the country's total production from 2012 to 2019 (PSA, 2019).

One of the major contributors for the increase in production of the said crop is the municipality of Cabatuan in Isabela. Through the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) funded research project titled, Community-based Participatory Action Research (CPAR) Model Showcasing Mungbean GAP-based for Improved Rice Productivity in Lowland Rice-based Areas of Culing Cluster, Cabatuan, Isabela, the DA-Cagayan Valley Research Center (CVRC) CPAR team was able to introduce technology interventions such as the improved mungbean

varieties (UPL Mg 7 or Pagasa 7 and NSIC Mg 12 or Pagasa 19).

Also, different yield and income enhancing package of technologies for mungbean production were introduced to at least 30 demo-farms (farmer-managed) in the clustered barangay of Culing in Cabatuan, Isabela. These addressed their problem on rice monocropping which led to the build-up of pests and diseases and low income for the farmers.

Rolly B. Acosta, Culing Centro barangay captain, is one of the farmer cooperators and has been a farmer for 37 years. According to him, the application of Rhizobium inoculant and carrageenan fertilization practice introduced by the said project almost doubled their yield.

"Kapag ginamitan [ang munggo] ng inoculant at carrageenan, lumalaki at dumadami ang kanyang bunga, sa katunayan kapag maganda ang panahon ay kinakayang makaani

ng humigit kumulang 2.5 tons kada ektarya kumpara sa dating ani namin na umaabot lamang ng 600-800 kilograms per hectare," he said.

Seed inoculation with root-nodule bacteria is a way to supply the nitrogen requirement of mungbean, instead of supplying expensive inorganic fertilizer. Soil bacteria introduced through seed inoculation lives inside the nodules (small lumps that form on legumes roots) and fix nitrogen from air into a form usable by plants. Rhizobium inoculants are available for free at DA-Regional Soils Laboratory.

The carrageenan plantgrowth promoter, introduced by DA-CVRC, is a natural polymer extracted from red seaweed processed using electron beams into a foliar fertilizer sprayed at certain stages in the plant's life. It was developed by the Department of Science and Technology-Philippine Nuclear Research Institute and one of the technology interventions for fertilization of mungbean.



Gold as the Ultimate Cash Crop

and Camille O. Francisco

Introduction of an improved cropping system such as rice-rice-mungbean cropping pattern brought a 27 percent increase equivalent to PhP 34,110 in the average monthly income of farmers in the said clustered barangay. Due to the proven increase on mungbean and rice yield and income as a result of applied technology interventions, a total of 215 hectares expansion areas involving 150 farmer/growers in Cabatuan, Isabela are now adopting the promoted technology inventions and encouraged to undergo crop diversification.

“Masasabi ko na ang pagtatanim at ang pag-aani ng munggo ang talagang inaasahan naming magdadagdag ng kita namin sapagkat dito ay walang masyadong puhunang ginagamit,” Acosta explained.

The additional income he obtained from planting mungbean was used in the educational expenses of

his children and for buying inputs needed for rice production.

In the current farming situation, farmers are now also adapting the practice of utilizing the mungbean standing crop as “green manure” for the next cropping of rice production which signifies not only the sustainability of the project but the innovations of the farmers in the introduced interventions as well.

“Kami ay nagpapasalamat sa DA-CVRC at DA-BAR sa pagpapakilala sa amin ng mga teknolohiya sa CPAR project na ito. Dahil dito ay lumawak ang aming kaalaman lalong-lalo na sa mungbean production, na talaga namang dinadagdagan ang aming kita, lalo na sa panahon ngayon ng pandemya,” he added.

Farmer-cooperators who have been capacitated through the business enterprise and seed production accreditation training are now supplying quality

mungbean planting materials to DA-CVRC AgriStore, RAMGO Seed Company, and DA-Cagayan Valley. The raw materials produced by the farmers of Culing Cluster are now being sold to the Farmers Land-Owners Workers of Pariir Agriculture Cooperative—the technology adopter of the MangBean brand (mungbean-based food products). This is an off-shoot activity of a technology commercialization project funded by DA-BAR titled, Enhancement and Commercialization of Developed Mungbean-based Food Products, therefore completing the value chain of mungbean production in the said municipality. ■

For more information:

Vanessa Joy F. Calderon
Science Research Specialist II
Cagayan Valley Research Center
Department of Agriculture-
Cagayan Valley
San Felipe, City of Ilagan, Isabela
0917 315 9327
cvrc.rfo2@da.gov.ph
vanj14calderon@gmail.com



Package of technology addresses the problems of farmers in Enrique Villanueva, Siquijor

by Fabio G. Enriquez, Ph.D.



Most of the people in Barangays Parian and Olave in the municipality of Enrique Villanueva, province of Siquijor are engaged in farming. It is considered as their main source of income, but low productivity and profitability were identified as major problems based on the results of Participatory Action Research (PAR).

Thus, the Community-based Participatory Action Research (CPAR) technology intervention was conducted showcasing the Package of Technology on crop production enhancement for lowland vegetables, crop-livestock integration, soil and water conservation and management, organization development, and marketing assistance.

Implemented by the Department of Agriculture (DA)-Central Visayas with funding support from DA-Bureau of Agricultural Research (BAR), the project aimed to increase income and uplift the living conditions of these farmers.

Crop production enhancement for lowland vegetables

Before the CPAR implementation, farmers planted *pinakbet* vegetables (squash, *ampalaya*, and pole sitao) after harvesting corn. The production data of that practice showed an average farm annual income of PhP 2,365.70 per farmer respondent.

Seeing this meager income, diversification and intensification of the farming system on high



PHOTO COURTESY OF FENRIQUEZ/DA-CENTRAL VISAYAS

value crops such as watermelon, sweet corn, peanut, and various *pinakbet* vegetables were introduced to gain more profit in larger production area.

During the intervention, watermelon obtained the highest percentage increase in income with 99 percent, followed by intercropped peanut and sweet corn with 93 percent, eggplant with 91 percent, balsam pear ampalaya with 88 percent, pole sitao with 81 percent, and squash with 72 percent.

In terms of return on investment, eggplant recorded the highest with 258 percent, followed by watermelon with 202 percent, peanut and sweet corn intercropped with 152 percent, pole sitao with 143 percent, squash with 131 percent, and balsam pear with 87 percent. These numbers manifest that the increase in income was due to the adoption of improved production technologies such as the use of hybrid seeds, plastic mulching, cropping pattern system, and balance fertilizer application.

While high production cost was incurred due to the use of hybrid seeds and high cost of labor during land preparation, plot bed making, plastic mulch use, land rental, and other materials used during the establishment of the project, this was reduced in the succeeding cropping season because some of the materials were already established.

Livestock integration (small ruminants)

To maximize production, livestock integration was introduced. Farmers got one packet of small ruminants (upgraded goat), 10 does and 1 buck, and was integrated into the CPAR model

farm. Also, the farmer-partners received one head of an upgraded goat (doe) for breeding purposes following the payback scheme by giving one head firstborn goat to another farmer adopter.

Starting from two packets of small ruminants (upgraded goat) with 10 does and 1 buck per packet in 2019, offspring produced were 15 heads male and 25 heads female with a value equivalent to PhP 42,000 and PhP 56,250, respectively. The 40 offsprings produced from two packets of goats have an equivalent value of PhP 98,250 and thus, farmers' partners obtained an additional source of income. There is a high demand for goat meat due to tourism activity in the province.

The integration of livestock in the farming system also provided the farming household an additional source of income and reduced the cost of production by utilizing its manure as a source of fertilizer.

Soil and water conservation and management

Aside from production, the project also takes into account the soil and water conservation and management. Eventually, the farmers established contour structures such as contour bunds, hedgerows, and contour canals in sloping areas to arrest soil erosion and maintain its soil fertility.

This also addresses water supply requirement in the area which is necessary to boost crop production output, thereby increasing farmers' income and profit.

Organization/association of farmers to enterprise development/agribusiness support

Farmer beneficiaries were

organized into an association named Parian Olave Vegetable Growers' Association and registered in the Department of Labor and Employment. They were encouraged to plan, implement, monitor, evaluate, and formulate rural and agricultural development activities to sustain the project.

To build strong and sustainable agribusiness models from subsistence farming to commercial production, the farmer association was provided with agribusiness support through Municipal and Provincial Agro-Fairs and Farmers' Day that happens annually for them to directly market their farm produce. The farmer partners were also trained to process, package, and promote value-added products like peanut brittle, peanut kisses, and peanut butter.

These CPAR projects showed positive results. Indeed, it caught the attention of farmers within and neighboring barangays due to its doable farming system that suited to the available resources with market opportunity. At present, farmer adopters were mostly from younger generation aged 14 and up. This group has seen the efficiency and good impact of the research project that they themselves have voluntarily engaged into this type of farming without being told persistently about it. Truly, CPAR has lined up to its expectation of community development. ■

For more information:
Fabio G. Enriquez, Ph.D.
Chief, Research Division
Department of Agriculture-
Central Visayas
Maguikay, Mandaue City, Cebu
0917 163 5318
fabsyam2004@yahoo.com



CPAR empowers lady ARB, changes her life

by Michael F. Dabuet and Rufelie S. Gula

Empowerment is widely acknowledged as the process of being able to increase self-efficacy, make life-enhancing decisions, and gain control of things and situations. It is believed that when women are empowered, they can make a difference and do immense and significant contributions to society.

In the rustic village of Gov. E. Jaro, Babatngon, Leyte lives 60 year-old Nenita D. Badajos and her family. She typifies the Filipino housewife and takes care of her seven children, while her husband looks for work to survive.

She and her husband are Agrarian Reform Beneficiaries (ARB) of the Department of Agrarian Reform (DAR) who are Certificate of Land Ownership Award holders—tenants of the one-hectare rice lot they are tilling. They started farming in 1980

when they were newly married, raising swine and native chicken on the side.

In 2018, she became one of the farmer cooperators of the Community-based Participatory Action Research (CPAR) on Rainfed Lowland Rice-Based Integrated Farming Systems in Brgys. Gov. E. Jaro and Bagong Silang Babatngon, Leyte, a project of the Department of Agriculture (DA)-Eastern Visayas supported by the DA-Bureau of Agricultural Research (BAR). Specifically, the project promoted the rice-duck-vegetables integrated farming system with 40 farmer-cooperators.

Before CPAR was implemented in their area, Badajos cultivated a small backyard garden for home consumption. Aside from rice production, she augmented her family's sustenance by the catch in

their *payao* (fish pen). Earning more or less PHP 3,000 per month, this was hardly enough to support the needs of their growing children.

Together with the other CPAR farmer cooperators, Badajos is also a member of the Bagahupi Integrated Farmers Entrepreneurs Association. She decided to become part of the association, not only to help her family, but to help raise awareness on the important role and potential of women in planning, decision making, management, and leadership. She hopes to change the traditional mindset of the community that women are also hardworking and resilient and should be accorded the respect they deserve.

This gradual awakening may be credited in part to values formation conducted by the CPAR Team and other capability enhancement

activities that teach values around gender sensitivity and respect for diverse gender identities. These values are deeply instilled in farmer-beneficiaries.

Through CPAR, she was registered to the DA-Registry System for Basic Sectors in Agriculture to avail of benefits from the agriculture agency. The project provided her with a starter kit which include 15 kilograms hybrid rice seeds, two sacks of urea, and complete fertilizers. She was also given an initial 50 heads mallard duck and agricultural supplies to start her egg production.

Together with the egg production of her fellow recipients, she now processes salted eggs and markets it at the Tacloban City Public Market. She likewise participated in the regional Kadiwa ni Ani at Kita test market sponsored by DA.

Aside from the rice and ducks, she also thanked the DA-BAR and DA-Eastern Visayas for its grant of vegetable seeds and fertilizers, which enabled her to engage in vegetable production cum edible landscaping—an aesthetically designed garden using environment-friendly, recyclable materials and bursting with different vegetables such as pechay, tomatoes, eggplant, hot pepper, patola, and turmeric.

With her good performance in CPAR, she was given more support by the Local Government Unit-Babatngon like a one-time assistance of yellow corn seeds and fertilizers. The agriculture technologist also visits her farm periodically to monitor, mentor, and give advice.

Her high school level education did not deter her from attending

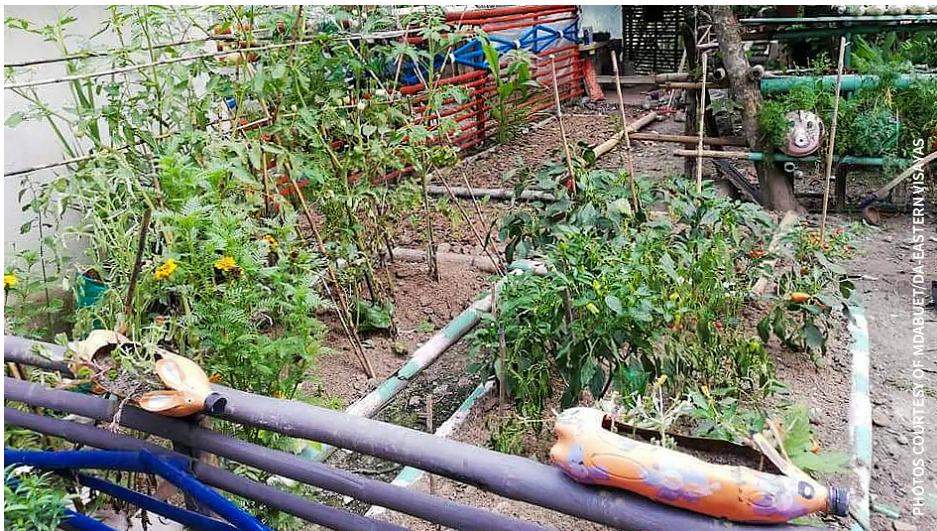
different trainings to broaden her knowledge and skills in farming.

She became emotional when she shared that her rice harvest has increased from 50 to 120 cavans after attending the season-long Farmer Field School. She also observed that the golden *kuhol* (snail) has been eliminated since she ventured into rice-duck farming. She was pleased to say that her family income has breached the PhP 5,000 mark since she got involved in the CPAR project. She was also proud of her participation in the CPAR Congress at DA-BAR in 2019.

Nenita has worked tirelessly all her life, with or without the pandemic. Through her travails and difficulties, she has managed to provide a good life for her family and sent her children to school. Two of them are now college graduates and professionals, two are still studying, and the rest help out on the farm.

The former plain, unassuming housewife became active in the affairs of the association and the community. She embraced all the responsibilities that came with being a farmer-beneficiary, believing in the slogan, “*Ang kaya ni Juan ay kaya ni Juana.*” (What Juan can do, Juana is equally capable of doing).

“*Juana Laban sa Pandemya: Kaya!*” One snappy salute to Badajos, a living proof that empowered women conquer and rule even in difficult situations, for she believes that her dreams for a better life must continue, despite the pandemic. But while the global health problem has caused one of the greatest disruptions of all time, agriculture projects, such as CPAR, offer a unique opportunity to change the course of development in the Philippines towards a more gender-sensitive environment, increased income, and improved productivity, leaving a legacy for the next generation of Filipinos. ■



THE WE R2GETHER IN A

by Rose Mary G. Aquino, DA-Cagayan Valley Regional Technical Director for Research and Regulations



Oftentimes, research is regarded as an activity that takes place in a laboratory with very few people involved. But that is not the case when it comes to participatory agri-research where the community is actively involved from planning up to the implementation of the project.

Community-based Participatory Action Research (CPAR) is a location-specific research cum extension that deals with improving the farming practices of the community using appropriate technologies suited to their needs.

Let us take a look at how CPAR works.

Define the core problem

For CPAR projects, the primary sources of information are the farmers or the community members. Hence, the Participatory Rural Appraisal is conducted prior to the formulation of detailed proposals for CPAR. In the process of PRA, research and extension team composed of staff from regional field offices (RFOs) and local government units (LGUs) will employ different PRA tools to guide the community members or farmers in assessing their needs including available resources that can be tapped in the course of project implementation.



PHOTOS COURTESY OF RMAQUINO/DA-CAGAYAN VALLEY

The key to define the core problem is to listen to what the community members are going to share and process that information using the different PRA tools. Wallerstein et al. (2010) pointed out that the community members, in general, understand the problems that affect them, which makes them qualified to participate in the formulation of research questions and designs.

Facilitators of this activity should be keen to details. For example, in our CPAR project on Off-Season GAP-based *Pinakbet* Vegetable Production in Support to the Food Trading in Roxas, Isabela, farmers revealed that

they experienced numbing of hands due to excessive application of pesticides in their vegetable production. Our PRA team took note of this crucial information and used it as one of the bases in crafting the community plan.

Provide practical solutions

The technologies provided through CPAR projects are those that truly address the identified needs of the community. In doing so, available proven technologies can be introduced to address the needs of the community.



Going back to our example above, the good agricultural practices emphasizing on the strict adherence to the pre-harvest interval of pesticides was introduced to address the excessive usage of pesticides.

Farmers were also taught to use biological control agents to reduce their dependence on chemical-based insecticides. The use of rapid test kit for pesticide residue detection at farm level was likewise introduced as part of technology intervention aiming to support food safety.

Create the Project Management Team

The Project Management Team needs to be created to ensure the smooth implementation of the CPAR project. It shall be composed of a CPAR focal person from RFOs, LGUs, and farmers/fishers group. One key here is to also partner with other relevant agencies or stakeholders that might be of help in the project implementation.

It could be divisions from RFOs who have the needed expertise. The roles of these partners must be clearly identified to know who does what and what resources need to be complemented.

Disseminate project results

One of the goals of CPAR project is to encourage adoption of technologies showcased in the CPAR. Here, project results are presented through field days.

For instance, this was instrumental in the implementation of Food Safety Program in different provinces of the region. It made different LGUs recognize the importance of producing safe food not just for the consumers but also for farmers themselves who are growing food.

Today, we now have an ordinance enforcing the implementation of Food Safety Act of 2013 in the entire

Source: Wallerstein, Nina, and Bonnie Duran. 2010. "Community-Based Participatory Research Contributions to Intervention Research: The Intersection of



Nueva Vizcaya. Other municipalities in Nueva Vizcaya such as Bagabag already passed their ordinance supporting such while others committed to issue and execute the same through Sanggunian Bayan resolutions.

Further, the Nueva Vizcaya Agricultural Terminal Inc., is the first trading center in the entire country to adopt the Food Safety Program on Vegetables and Fruits. Most importantly, the region has now 35 farmer cooperatives and associations issued with Certificate of Compliance for Maximum Residue Limit for organophosphates and carbamates.

CPAR projects, in one way or another, have transformed the lives of the farming communities making the impact of agricultural development more profound. These projects do not only teach how to increase yield and

income but also made the farming communities socially and environmentally responsible.

With this, I am encouraging everyone most especially the farming and fishing communities to actively participate in CPAR projects that are being conducted and will be implemented all over the country. After all, these technologies developed by researchers are for stakeholders to utilize. ■

For more information:

Rose Mary G. Aquino

Reginal Technical Director for Research and Regulations
 Department of Agriculture-Cagayan Valley
 San Gabriel, Tuguegarao City, Cagayan
 0926 051 6710
 rosegauino@yahoo.com

COMMUNITY-BASED PARTICIPATION ON RAINFED RICE-BASED SYSTEMS



FARMER'S PRACTICE (FP)



CPAR TECHNOLOGY
INTERVENTION

Rice Component

Seed Variety



Use of any varieties, PSB Rc10
PSB Rc82, NSIC Rc 216 and Rc 226

Seeding Rate



Use of 120-180 kgs/ha seeding rate

Fertilizer Recommendation



No recommendation followed



Application of 2-8 bags/ha of T14
and 2-4 bags/ha Urea



Mixing of 2 fertilizer materials
(usually T14 and Urea or Urea and
16-20-0)

Pest Management



Spraying when there were insects
observed in the field

Seed Variety



Use of adaptable rainfed varieties,
NSIC Rc392 and Rc27

Seeding Rate



80 kgs/ha seeding rate

Fertilizer Recommendation



Use of Rice Crop Manager (RCM)
recommendation

Pest Management



Use of IPM for Rice (biological
control such as *Trichogramma*
japonicum and *Metrahizium*
anisopliae)

Mungbean + Vegetable Component

Seed Variety



Farmers' local variety



Based on available stock on local
market or from fellow farmers

Seeding Rate



15 kg/ha

Seed Inoculant



Without seed inoculant

Seed Variety



Good quality seeds
Improved variety
Glossy green variety

Seeding Rate



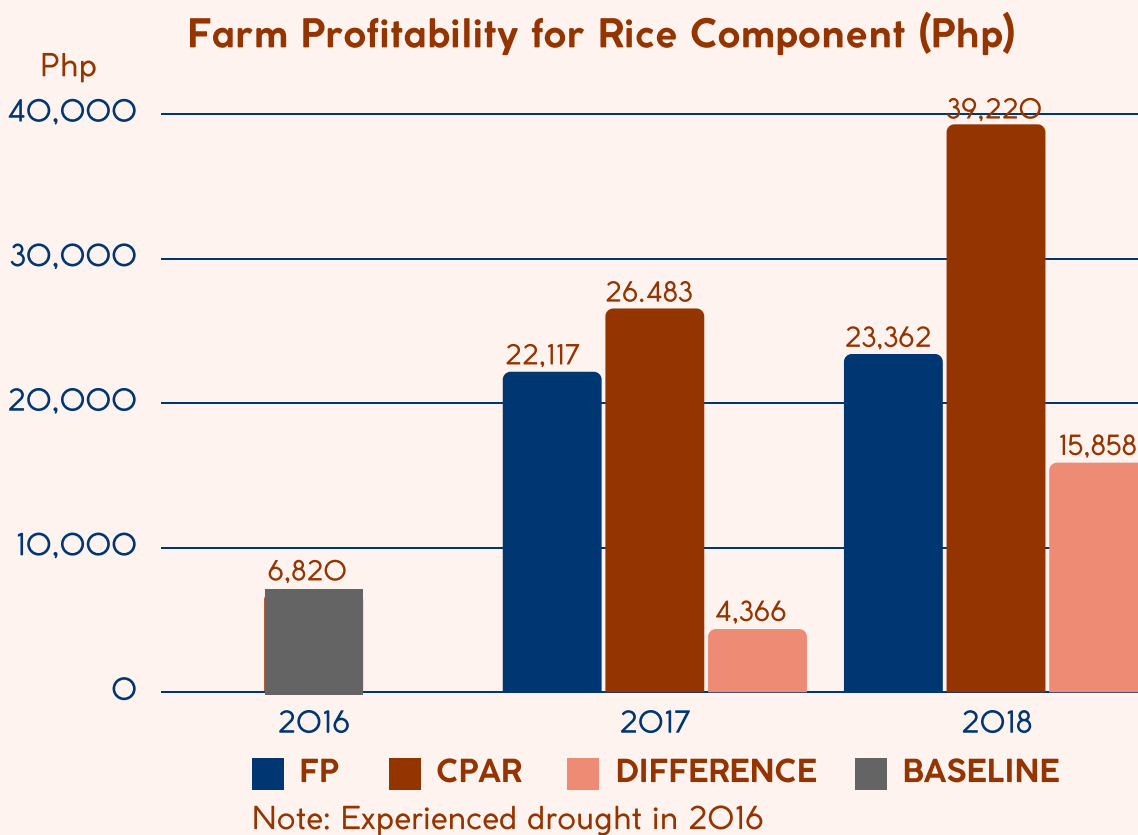
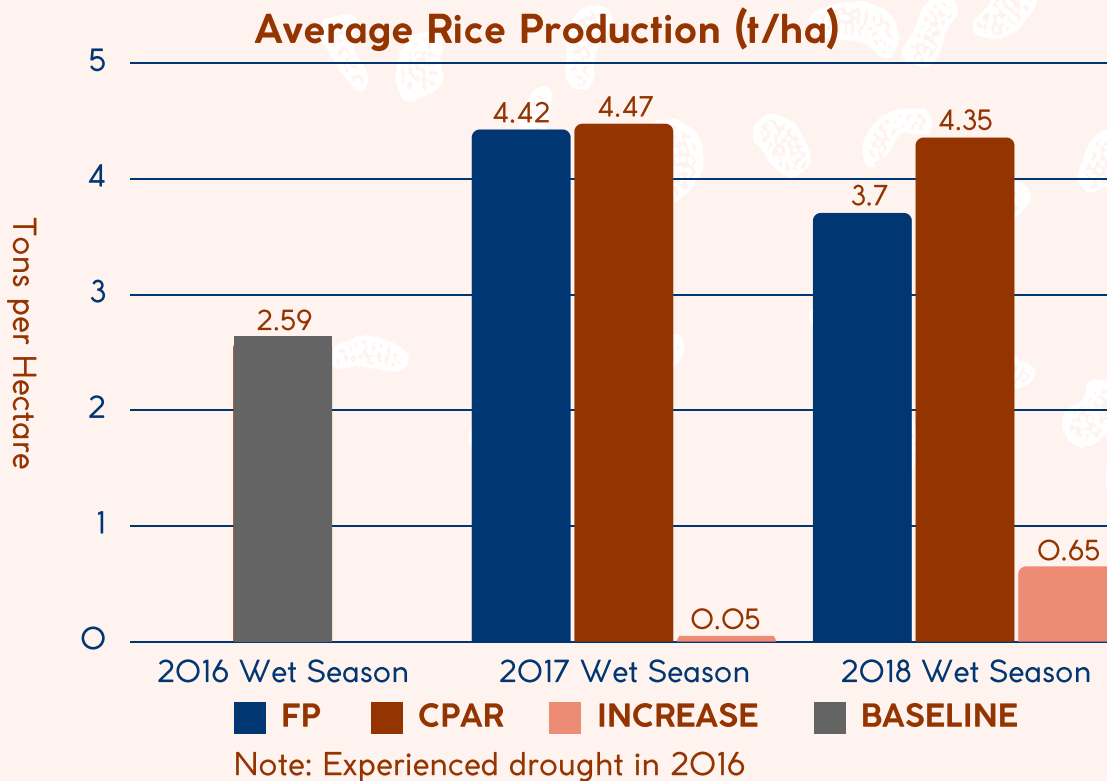
25-30 kg/ha

Seed Inoculant



Incorporation of *Rhizobium*
inoculant on seeds before
sowing

EMPIRICAL ACTION RESEARCH SYSTEM IN SAN MIGUEL, ILOILO



What is your vision for the bureau?

I envision an organization that works for and with the people. The bureau is filled with promising individuals that truly excel in the field. I want to see these people work hand in hand with our partners, farmers and fisherfolk—exchanging ideas and imparting wisdom to one another, to be able to produce outputs and outcomes that are not only knowledge-based but immersed with experience as well. As OneDA, we must be a voice to our stakeholders and be a representation to achieve and provide what the agricultural community needs.

BAR has supported a lot of research for development projects and initiatives in the past and most of them are truly noteworthy—thus the need to upscale and outscale them so that more people will reap the benefits of these agriculture and fisheries innovations. One approach that we are focusing on is translating the R4D outputs and outcomes into policies for development or what we refer to as Research to Policy for Development and Extension (R2P4DE).

How does it feel to be part of BAR? Which part/aspect of it do you enjoy most?

The people I work with makes the experience at BAR worthwhile. Seeing all these dedicated individuals work together inspires me to be at my best as I lead the organization.

Being able to partake in many R4DE efforts directed towards the improvement of livelihoods of my fellow farmers and fisherfolks is what I enjoy the most.

What was your initial reaction when you learned that you were chosen to lead this bureau?

It was a mix of different emotions – I was overwhelmed and curious,

since I am new to the organization. I am unfamiliar with how things work around here and curious as to what my directorship entails. Nonetheless, I am generally happy and very grateful for the opportunity to serve DA on a national level. It is a pleasure to be part of an organization wherein I will be able to share my expertise on project development and resource generation; development of policies and guidelines; and research and extension management.

What are you most proud of in your career so far?

That would be my extensive background and exposure in the different fields/aspects of agriculture which will come in handy as I take the lead in our organization.

Also, being a farmer myself which gives me a first-hand experience and understanding on matters concerning our fellow farmers.

How would you describe your leadership style?

I put my trust in my co-workers. I believe that they will deliver their responsibilities to the best of their abilities. As a leader, I aspire to inspire my colleagues—through my works and actions—to be a united organization in the fulfillment of our mission and vision.

I believe in the capabilities—tapped and untapped—of people. A little encouragement and coaching goes a long way, regardless if you're young or have been a long-term employee.

What are your long-term goals?

As a hands-on farmer myself, I envision a technology-empowered agriculture and fisheries sector. With the realization of the OneDA Pillars and Key Strategies and our collaborative efforts in carrying out R4DE strategies and programs, I

am hopeful that this vision will be attained in due time.

What was the hardest decision you have ever had to make professionally?

They say that when a door closes, if you look long enough and hard enough, if you're strong enough, you'll find a window that opens. For me, however, it was the opposite. When the window for an opportunity at BAR opened, I had to make choices to close some doors. It wasn't the easiest decision but it definitely was something I have wholeheartedly chosen in order to pave the way for new opportunities.

What do you do during your free time? How do you detox from stress?


Going home to my farm after a long work week and seeing the fruits of my labor grow healthily is one of the ways I destress.

If you could choose a superhuman ability, what would it be?

If I am to hold a superhuman ability, it is the power to raise our organization's budget way higher than what we are provided in order to do more and bring more. This will give us the chance to implement more R4DE initiatives and extend more services to our partners and stakeholders.

Holding on or letting go? *Kailan mo masasabi na dapat pa mag-hold on or mag-let go na?*

We can only do so much as a human being for others. There is always a limit to which we can tolerate those happening around us. Once the person, object, or environment we're holding on to starts becoming toxic and destructive, I'd say it's time to let go and move forward. Holding on to something that slowly shatters your being is unhealthy and will only pull you backwards, preventing you from progressing and reaching your goals. ■

A portrait of Dr. Junel B. Soriano, the new DA-BAR director. He is a middle-aged man with short, graying hair and a mustache, smiling at the camera. He is wearing a light blue, long-sleeved, button-down shirt with intricate embroidery on the front, a dark gray jacket, and dark trousers. He is seated in a wooden chair with a blue cushion. The background is a wall of vertical wood panels. On the left side of the image, there is a large white text overlay. On the right side of his jacket, there is a circular logo for the Department of Agriculture, featuring a stylized plant and the year 1898.

Getting to know Dr. Junel B. Soriano, the new DA-BAR director

Interview by Mara Shyn M. Valdeabella and Geline Nicole A. Morillo

Honey-based Community Enterprise Development in Lanao Del Norte

In 2011, the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) and the DA-High Value Crops Development Program, together with State Colleges and Universities, Local Government Units, private enterprises and stakeholders crafted the 2012-2016 Philippine Apiculture Status and Research, Development, and Extension Agenda.

This paved the way in supporting the commercialization of technologies developed by the University of the Philippines Los Baños (UPLB) Bee Program in 2007—covering the mass production and utilization of stingless bees used for large scale mango orchard pollination.

In 2019, stingless beekeeping was introduced in three municipalities in Lanao del Norte through the initiative of Congressman Abdullah D. Dimaporo and funding support of DA-BAR in partnership with the UPLB Bee Program.

The project aims to commercialize stingless bee keeping, upscale pasture areas, ensure quality control and quality assurance of bee products, and make beekeeping a small-scale enterprise for the communities.

Trainings on bee management were given to 90 residents coming from the municipalities of Sultan Naga Dimaporo, Kapatagan, and Tubod. The trainings included handling of bee colonies, propagation

(multiplication), identification of pests and diseases, hive management and bee product processing.

An initial of 50 colonies were delivered to the project site in Sultan Naga Dimaporo and an additional 100 colonies are being readied for delivery as soon as travel restrictions are lifted. The site for the new batch was already validated for the availability of forage resources and peace and order situation.

From the initial colonies, the participants were able to develop and package bee products such as soap and lip balms, aside from honey.

Below is a financial analysis presenting the 150 colonies based on initial projection and does not include processing and packaging of bee products.



150 starter colonies = PhP 165,000



30 kilograms propolis = PhP 13,500



52.5 kilograms honey = PhP 70,875



111 kilograms pollen = PhP 50,625



Assumptions:
On the 2nd year of operation at least 50% of colonies can be divided or split into two (2) which will increase the number of colony holdings.

Let's hear our CPAR farmer-partners!...from page 32



Crystal Joy Diaus
Carranglan Nueva Ecija

Ang CPAR project po ang naging simula ng pagbangon ng kababaihan sa Binbin at dumami ang mga active members. Nabigyan kami ng puhunan na mapapakinabangan namin sa bawat rotation ng batch at ibinigay sa amin ang opportunity at privilege sa paggawa ng mushroom cracker kasali na rin ang fruiting bags at iba pang training sa processing.



Paolo Candilado
Matina Biao, Davao City

Ipinakilala sa amin ang teknolohiyang may dagdag kita dahil hindi lang niyog ang pagkakakitaan, nadagdagan ng cacao at saging na itinanim sa gitna ng mga niyugan. Ang dati kong ani't kita sa 1.5 ektaryang niyugan ay umabot ng 5 tonelada mula sa 2.5 tonelada kada 3 buwan pagkalipas ng 3-4 taon ng proyekto. Kumikita ako ng PhP 140,000 sa niyog/taon, PhP 288,000/taon sa saging at PhP 115,200/taon sa cacao. Nang dahil sa dagdag kita, nakapagpagawa ako ng bahay, nakabili ng kalabaw at motor at nakapangtustos sa pag-aaral ng aking anak.

Sa tulong po ng CPAR project, kami po ay naturuan ng GAP kung saan nabawasan po ang aming gastos sa pataba at pestisidyo kaya naman tumaas po ang aming kita sa garden ng 30%. Dagdag pa po ang pagpapakilala sa amin ng mushroom farming at pag-process ng aming mga gulay kapag mababa ang presyo at mga reject.

Noong panahon ng COVID, inilapit po kami sa KADIWA market at naibenta ang aming mga produkto sa magandang presyo at nakilala pa ng ibang mga mamimili.

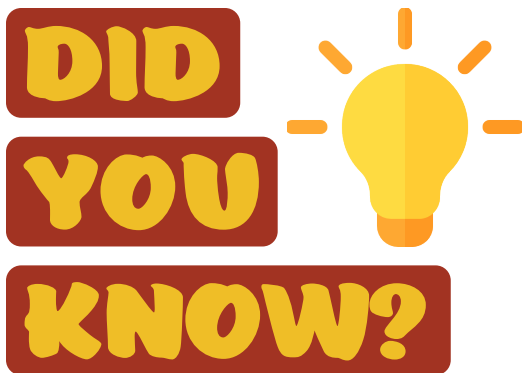


Dominguez Pangyos
Carranglan, Nueva Ecija

Malaking pasasalamat namin sa CPAR dahil hindi lang pala sa saging kumikita, pati na pala sa tubig ng niyog na sa tingin namin ay wala ng silbi. Tinuruan kami kung paano ang tamang pagproseso ng organic coco sauce na nakapag-anyaya ng apat pang barangay kasi dati dalawang barangay lang ang may CPAR members. Sa ngayon, dumarami na po kami.



Marites Tacasan
Oroquieta City
Misamis Occidental



The **Community-based Participatory Action Research (CPAR)** is a location-specific research cum extension approach that deals with improved farming system technologies for specific micro agro climatic environment within a province/municipality.

The objectives of CPAR are:

1. To accelerate technology transfer from technology generating system to the farming and fishing community for increased total productivity and income;
2. To enhance the role of R4D in technology transfer and production management system;
3. To institutionalize active community participation in the overall management of farm and aquatic resources; and
4. To develop strategies for effective integration of support services for fisheries/agribusiness and enterprise development.

Let's hear our CPAR farmer-partners!



Myrna Ariola
Don Carlos, Bukidnon

CPAR ang dahilan kung bakit umangat at guminhawa ang aming pagsasaka at pamumuhay. Mula sa 30 members na may PhP 120,000 equity, naging mas organisado at empowered kami na umabot hanggang 173 member at may PhP 10 million total equity dahil sa dami ng government grants on rice mechanization.

Umangat ang aming ani at kita mula 10% hanggang 25% at patuloy kaming nagbebenta ng aming ani sa NFA at kilalang certified seed grower sa Bukidnon. Na practice din namin sa aming rainfed rice areas ang rice-rice-soybean/vegetables (squash, string beans, eggplant) cropping system na dumagdag sa aming ani at kita at nagpapabalik sa taba ng aming lupa.

Taong 2016 ng pumasok ang CPAR project na pinundohan ng DA-BAR sa aming barangay at doon namin nalaman na pwede pa palang ibalik ang dating mabungahing cacao sa pamamagitan ng tamang nutrient management, IPM, pruning, at grafting. Bukod dito, natuto rin po kami ng record keeping na mahalaga pala tulad sa aming magsasaka.

Nang dahil sa teknolohiyang itinuro ng CPAR, pati mga kapatid ko at kapitbahay, gumaya na rin sa teknolohiya. Hindi lamang na upgrade ang aming mga tanim na niyog, cacao at saging, pati na rin ang buhay naming mga magsasaka, dahil lumaki uli ang aming kita, malaking tulong para sa pangangailan ng aming pamilya at ng aming pagsasaka.



Wilma Rizare
Calinan District, Davao City



Rodrigo Alcaraz
Babatngon, Leyte

Nakabawas na kami sa binhi na ginagamit. Ngayon gumagamit lamang ako ng 35 hanggang 40 kilos, pero kumikita ako ng 120 hanggang 130 cavans. Naging epektibo po ang aming pagpapalayan dahil sa PalayCheck System. Sa paggugulayan at pag-aalaga ng itik sa loob ng tatlo hanggang apat na buwan naman ay kumikita kami ng PhP 80-90,000. Talagang mas lumago ang aming kita dahil sa pagbebenta ng fresh at salted egg. Dahil sa kaalaman na itinuro sa amin ng DA noong nagsimula iyong CPAR project, dahan-dahang bumuti ang aming pagpapalayan at tumaas ang aming kita.

turn to page 31

RESEARCH FOR DEVELOPMENT
BAR DIGEST

DA-BUREAU OF AGRICULTURAL RESEARCH
RDMIC Bldg., Elliptical Rd. corner Visayas Ave.
Diliman, Quezon City, Philippines 1104