Brief

Building Community-Based Models for Climate Resilient Agriculture and Fisheries

Across Landscapes within the Municipality of Ivisan, Capiz

Background and Introduction

A recent Inter-governmental Panel on Climate Change (IPCC) report states that climate change is unequivocal and its immediate impact is the modification of the worlds' biophysical and natural systems resulting to changes in interspecies dynamics, movement of range, altered abundance, and shift in seasonal activities in various ecosystems. Agriculture will be the hardest hit sector globally as its productivity is primarily based on the integrity of agro-ecosystems. Adverse impacts to agriculture will have direct impacts on livelihoods, food security, and nutrition in rural areas.

Climate resilient or smart agriculture (CRA/CSA), as a climate change response, provides an option for resource poor farmers in rural areas through its three- tiered objectives, which are: ***(a) increasing agriculture productivity and income in a sustainable, environmentally sound manner; (b) building capacity of households and food systems to adapt to climate change; and (c) reducing emissions of Greenhouse Gases (GHG's) while increasing carbon sequestration of agro-ecosystems. Healthy landscapes support food security, livelihoods, and ecosystem functions (helping build resilience).***

Global knowledge and experience on CRA/CSA is already vast. IIRR believes that its greater adoption by small-holder farmers, especially in the Philippine context, could be facilitated and accelerated, if and when, interventions are coordinated and done through community-based approaches. Community-based participatory adaptation will be facilitated if interventions are undertaken through multiscalar and multisectoral approaches, with public and private actors converging their services at community and sub-national levels.

Climate change is a threat multiplier for vulnerable and poor households as its adverse impacts can delete assets, wipe out savings, and generally roll back progress achieved in the last decade in realizing millennium development goals.

An essential element for evidence based decision making is to ensure access of policy makers, planners and local government executives to proof-of-concept sites where adoption on scale can be demonstrated and evidence is already available. A diversity of impact areas (each focusing on a specific resources/commodity area) will provide platforms for farmer to farmer sharing of exemplary practices.

To sustain such interventions however, it is necessary that along with increasing the knowledge and practice of small-holder farmers in CRA/CSA, they are also provided with well-informed support systems from the government and private sector, especially from the Department of Agriculture and local governments. This is to ensure that future investments and programs targeting small-holder farmers have sustainable outcomes.

Landscapes also provide strategic food, fuel, fertiliser and feed reserves. Diversity of land use can be seen in landscapes in the Philippines and in much of Southeast Asia. By using a landscape approach and applying climate smart agriculture there are many ways of increasing mitigation and adaptation opportunities on the farm, in communities and throughout the ecosystem while sustainably increasing and intensifying productivity.[1]

[1] Mainstreaming climate smart agriculture into broader landscape approaches, Background paper for the Second Global Conference on Agriculture Food Security and Climate Change , FAO, Sept 2012

The task for agricultural research and development professionals is to help small holder farmers and their communities find ways to diversify while also sustainably intensifying their farms to generate multiple benefits using existing technologies. Local platforms provide opportunities to farmers to learn and try various climate-resilient/smart agricultural practices. Later on they will decide which among this portfolio of technologies and approaches they will adopt and further develop. This is a process that is best led by local actors.

Testing climate smart crops/varieties is an important innovation-development activity.

A Project Site Situationer: Municipality of Ivisan

The Municipality of Ivisan is one of the towns in the Visayas hit hard by Typhoon Haiyan (Yolanda). The town registered loss and damages to agriculture amounting to a total of Php 263,314M and to fisheries amounting to P93,912M. This has affected the livelihoods of many people in Ivisan. IIRR was part of an effort with other players (FAO, Department of Agriculture) who came forward to assist.

The town remains predominantly agricultural and is still classified as a 4th class municipality. Its three main sources of livelihood are fishing, coconut farming and rice farming. Other farm-related livelihood sources include vegetable-growing,

Action research in Ivisan* is guided by the following key research questions:

- **How are increased adaptive capacities and livelihood resilience of agricultural and fisheries communities enhanced through participatory and community-based approaches?**
- **How can agricultural extension agents facilitate improvements in current local practices to highlight the science and climate agenda in agricultural food systems and value chain?**
- **What are the conditions and enabling factors that facilitatethe effectivescaling out of CRA at sub-national levels?**
- **How are local stakeholder capacities developed in establishing multi-scalar and multi-sectoral support services that sustain livelihood and community resilience of agriculture and fisheries communities?**

* This project is assisted by the Department of Agriculture (AMIA) and the Bureau of Agriculture Research in the Philippines.

small-scale poultry, and livestock-raising. A significant portion of the population is involved in non-farm activities that are strongly linked to agricultural production, such as: small-scale local buying-and-selling (vending) of food items, padyak and tricycle operations, sari-sari store operations, and other small enterprises.

The total land area of Ivisan is 5,420 hectares, making it the smallest municipality in Capiz. It is composed of 15 barangays classified into two urban barangays and 13 rural barangays. Ivisan topography is composed of coasts, plain to rolling hills, and some low elevation mountain peaks. Its natural environment includes forest land (with slope 18 °) constituting 1,512 hectares, with 50 hectares timberland at watershed area; 103,000 hectares of coastal area and approximately 25 km coastline (mangrove area is approximately 90 hectares and 691 hectares of fishpond).

Major crops grown includes coconut and rice with 2,294.5 hectares on the previous while 650.4 hectares on the latter. 3,217 farmers are depending on coconut as their primary livelihoods while 709 farmers are growing rice. Of the total land area of 5,420, only 70% or 3,812.36 hectares are crop land.

In terms of fisheries, 10 out of 15 barangays are considered coastal where there are 3,474 coastal households. There were 1,927 registered fisherfolks in Ivisan. In terms of specific areas for coastal livelihoods, fishpond area has 702.97 hectares, mussel farm area has 10,600 hectares, oyster farm area has 45,000 hectares and fish sanctuary and reserve area has 1,628.4 hectares.

Issues and concerns experienced by the municipality include low productivity in crops, high cost of farm inputs, indiscriminate use of pesticides and herbicides, impact of climate change and lack of irrigation facilities. For the livestock, high cost of production cost, incidence of pest and diseases for poultry, oversupply of swine and other related hazard and climate events such as typhoon, drought and red tide.

Approach and Methods

Participatory Action Research characterizes IIRR's work in the municipality

Action research is focussed on generating knowledge on approaches for facilitating community-based adaptation that results to increasing resilience of agricultural communities.

Social mobilization for action research implementation involves direct engagement with around 150 farming households in the 10 target barangays. Farmer groups (including existing farmer associations) form the core group engaged in participatory action research. The knowledge outputs of which is deemed to indirectly benefit a total of around 2,000 farming households in the municipality and beyond (in the form of improved access to information on improved farming practices).

The DRR and livelihood recovery projects implemented by IIRR in Ivisan are mainly following the community-based adaptation approach. Policy and program support of local governments is facilitated by evidence (proof-of-concepts). More work is however needed to come up with conclusive evidence that would influence local governments to further invest in CRA work and engage further in community-based adaptation programming.

Recognizing that local agricultural support services is limited (e.g. limited number of agricultural staff), farmer-led extension is highlighted. LGU extension capacity has to be complemented by providing with the front line presence of a local network of farmer promoters who serve as role models and knowledge source for others.

A participatory community-based action research seeking to deepen and build upon the current knowledge base for undertaking gender-sensitive community-based adaptation (CBA) and CRA/CSA outscaling is being undertaken by IIRR. IIRR has been working with the LGU and local community based organizations and civil society in the municipality for 2 years primarily on DRR, livelihood recovery and resilience building. It has already established social infrastructures that facilitated ease in the implementation of components in the DA-AMIA/BAR supported action research.

The project provides site-based participatory action research geared towards developing proof-of-concepts of how to facilitate community-based adaptation and livelihood resilience building on small landscape scales. Using social learning as a methodological approach, the project demonstrates scalable approaches relevant to local governments. Social learning activities are focused on testing, developing, and documenting community- based adaptation that can effectively facilitate the scaling-out of CRA practices within and beyond the project sites.

At least 10 contiguous villages, representing a range of agroecologies (from forestlands down to lowland rice-based ecosystems and coastal fishing communities) are implementing CRA/CSA. This helps generate an evidence base for transition of CRA practices from farm to landscapes. The project currently covers 10 barangays that are adjacent and near its small watershed and timberland. These contiguous barangays are where the IIRR already has had existing farmer cooperators and thus pre-selected as areas with high probability of delivering the target research outputs of this project.

CRA Options for Rice Sector

In February 2014, IIRR Philippine Program started its first phase of implementation of BRIDGE Project (Bridging Relief and Recovery towards Resilience Building in disaster affected areas in Panay. The project thematic components include Disaster Risk Reduction and Management, Psychosocial Support program and Livelihood Recovery and resilience building. The project was implemented in the Municipality of Ivisan, Province of Capiz.

IIRR conducted a training/ orientation on Low input Rice Production on June 2014. After the training, rice seeds specifically RC222 (from JICA) was distributed 135 farmers (47F, 88M) from the Municipality of Ivisan received 15 kg each.

In Barangay Ilaya Ivisan, 52 farmers received 15 kgs of seeds. At the start, only 15 farmers adopted the Low External Input Rice Production (LEIRP) technology. Ilaya Ivisan, is a plain with part mountainous barangay of Ivisan, Capiz. Total population number is 3,934 (CY 2010) with 1,924 male and 2,010 male with 679 households. It is a rural barangay with 562.9754 hectares total land area of:

- 52 ha residential
- 212.335 ha forest area
- 10 ha commercial
- 103 ha agricultural lands.

The area of rice production in the barangay is 36.7 hectares and 37 rice farmers. Broadcasting method in planting rice and use of commercial fertilizers and pesticides were main previous practices of farmers in Municipality.

Two Participatory Varietal Selection (PVS) on rice were conducted in the municipality of Ivisan for the farmers to have the best-bet option in the upland and coastal communities.

The following are the step-by-step procedure in conducting PVS in upland and saline rice varieties:

- site selection and beneficiary identification
- orientation on research protocols, parameters and standards in upland and saline rice varieties

- distribution of planting materials
- clearing and planting
- technical visit and monitoring
- conduct of farmer field day
- Research data gathering (crop cut)
- Evaluation / documentation of PVS

Participatory trials of stress tolerant rice varieties

- Average plant height of RC23 was 86.17 cm, which is higher compare to RC25, UPL R17, RC 27, and RC 29 where average plant heights were 78.33 cm, 75.83 cm, 70.33 cm, and 71.67 cm respectively.
- Average number of tillers were observed higher in RC 27 which is 25, average number of tillers in RC 25, UPL R17, RC 23, and RC 29 were 14.20, 13.60, 18.80, 7.60 respectively.

PVS on saline rice varieties

On the PVS on saline rice, three (3) varieties were tested from Philippine Rice Research Institute. NSIC RC 296, RC 328 and RC 326. Research outputs were documented

	NSIC RC 296	NSIC RC 326	NSIC RC 328
Number of days	111 days	115-116 days	112-114 days
Height	66.83 cm	67.06 cm	68.08 cm
Number of tillers	17.89	19.11	9.56
Estimated yield		2,427 kg / has	2,410 kg / has

Mr. Danilo Ducado and Mr. Rafael Derla were farmer local researchers in the conduct of PVS on upland rice utilizing PhilRice varieties. Varieties tested from PhilRice include RC 25, UPL R17, RC 23, RC 27 and RC 29.

SRI a climate resilient technology for marginal and small holders

Introduction of SRI

SRI is a practice that uses minimal amount of seeds through transplanting method (SRI)

- 1 - 2 seedlings/hill
- 25 cm x 25 cm planting distance
- 8 -15 days from seeding to transplant

Eight farmers from Barangay Ilaya Ivisan, Ivisan, Capiz were identified and selected to be the farmer champions with the following specified qualifications:

- Rice farmers
- Trained
- Interested

Issues/problems in rice farming were identified through commodity profiling:

- Rainfed rice fields
- Rice production require large capital (Labour cost in land prep and harvest; agricultural inputs)
- Varieties planted were not resistant to salinity, pests and diseases.
- Fertilizers are costly

Introduction of quality rice seeds

- 3 foundation Rice seeds varieties (RC160, RC222, and RC18) from PhilRice
- 12 received 1-2 kg of foundation rice seeds/farmer.

Scaling-out

- Farmer's Field day was held as a platform of scaling out:
- Each field owners talked about their experiences in following SRI pattern (its benefits and the description /characteristics of rice they propagated
- Characteristics of rice as the farmer co-operators mentioned best encouraged the farmer participants aside from what they can see on the performance of the varieties in the field.
- 4 farmers from said barangay were encouraged to adapt SRI using foundation rice seeds

Scaling-up

- 11 farmers fully adapted the technology in their whole area utilizing 20-60 kilos of rice that has accommodated 1 to 1.5 hectares of rice land area with minimal usage of commercial fertilizers and pesticides.
- Green leaf manuring was also tested in the area with 3 farmers cooperators last year and 1 farmer this cropping.

Five key principles of low external input rice production (LEIRP) system to address issues of high production cost and water availability issues.

Description of CRA Practice

The Systemss of Rice Intensification (SRI) creates a triple-win situation for agriculture, climate security, and food security because is sustainably increases rice production, strengthens crops resilience to climate change and variability and reduces rice production's contribution to climate change.

Studies in a number of countries have shown a significant increase in rice yield with substantial savings of seeds, water, and cost compared to conventional methods. The key practices were the following:

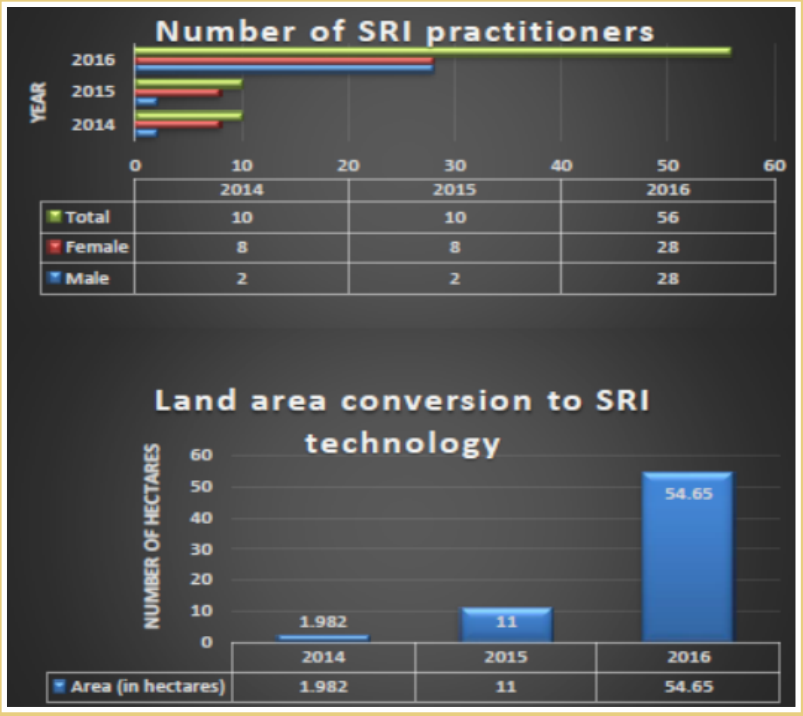
a. Transplant very young seedlings, raised in an unflooded nursery
b. Transplant them carefully and shallow
c. Transplant single seedlings and at wider spacing than now
d. Apply a minimum amount of water – no continuous flooding
e. Control weeds with active soil aeration
f. Rely as much as possible on organic matter for soil fertilization.
   - dry nursery method/DAPOG method of raising rice seedlings
   - transplanting using 1-2 seedlings per hill
   - straight planting with 20-25 cm interval
   - trial use of green leaf manure and organic pesticides, and
   - alternate wetting and drying.

Impact Area on Rice

Three (3) impact areas on Systems of Rice Intensification practice were developed where 56 farmer adoptors can be found. The impact areas includes Ilaya Ivisan, Ondoy and Cudian, 12 farmer adoptors are practicing in Ilaya Ivisan, 17 farmers in Ondoy and 22 farmers in Cudian. According to the database and information from the Office of Municipal Agriculture – Ivisan, a total of 709 farmers were involved in rice farming. A total of 650, 4 hectares were used in this livelihood activity and 11% of the total land area were utilized for rice farming. Since the beginning of the project, only the three (3) seed growers/farmers are using SRI or transplanting method. The chart below provides the detailed outcomes of the intervention on the rice sector specifically the practice or Systems of Rice Intensification.

In terms of area coverage from the broadcast method to transplanting or SRI, a total of 8% of the total rice farm area were converted and approximately 8% of the total rice farmers are now practicing SRI as their method of rice planting.

Snapshot of the outputs of LEIRP scaling out



ISIDRO Marker, a Farmer's Innovation in Rice Planting

After a long dry spell in 2015 due to El Niño, rice farmers were excited to start working in their paddy fields when monsoon rains arrived in 2nd week of June. One of them was Isidro Capas, a 65-year old seasoned rice farmer in municipality of Ivisan. For this cropping season, he was selected as one of few farmers who would be seed growers of foundation seeds[1] brought by IIRR to the community. The seeds came from Philippine Rice Research Institute. As a seed grower, he has to follow basic planting and farming practices to ensure optimal growth and high yield, such as: one to two seedlings per hill, planting of young seedling of about 8-15 day old and a spacing of 25 cm by 25 cm were practiced. In ensuring proper spacing, the most common material used is an IIRR-introduced marker that is evenly spaced and pulled by a farmer to create a mark.

Isidro however has a different idea on ensuring right spacing, instead of using the marker that farmers got used to, he devised an alternative yet similar devise. He did so with the belief that his innovation is simpler, easier to use yet precise, and most importantly replicable by other farmers. His innovation has been aptly branded as "ISIDRO marker," which is short for Innovative Simple Design Rolling marker. The innovation will be shared during regular rice farmer learning group meetings.

ISIDRO stands for Innovative Simple Design Rolling marker—the rolling marker made of bamboo that is spaced equally with 25cm following the Systems of Rice Intensification technology. It was designed by local farmer, Isidro Capas.

The farmer innovator also has constructed a Small Farm Reservoir that he envisions will be helpful to increase the availability of irrigation water in his farm. He is also a beneficiary of IIRR's livestock dispersal program.

[1] Foundation seed is designated by an agriculture experiment station. Its production must be carefully supervised or approved by representatives of an agricultural experiment station. It is the source of all other certified seed classes, either directly or through registered seeds. (Definition from the International Rice Research Institute)

[2] Gonzalo S. Ervano, Jr.

Increasing livelihood options for coastal communities:

A farmers' field day on sweet potato

The experiences of coastal communities in the municipality of Ivisan in the province of Capiz were the worst in terms of their coastal livelihoods. Beside from the onslaught on Typhoon Haiyan in 2014, the effect of climate variability changes their perspectives to shift and adopt in their common livelihood options that include oyster and mussel farming. In the last two years, 2015-2016, the municipal fisheries grounds of Ivisan were affected twice by algal bloom or red tide. The first occurrence was on September 2015 that lasted for one (1) month and the second incidence lasted for four (4) months from November 2015 to February 2016. The incidences were directly pointed to the production method of fishermen on oyster and mussel culture as most of the fisherfolks are using stake method from the bamboo. When the incidents happen, most of the households were food insecure as they do not have sustained livelihood and mostly rely on coastal resources.

The shift

With the support of the Department of Agriculture – Adaptation and Mitigation Initiatives in Agriculture of DA-AMIA project phase 2, the group with the technical support from IIRR established a Participatory Varietal Selection (PVS) on sweet

Sharon Daanton, the 1-BOFA leader shared her learning and experience to farmers and fisherfolks of Ivisan, Capiz on their sweet potato propagation center.

potato. Out of 64 members, 21 members actively engaged in the development of Community Support Facility. Thirteen (13) varieties of sweet potato (NSIC SP-30, VSP1, VSP2, VSP25, VSP20, NSIC25, VSP7, Tinagkong1, Tinangkong2, VSP5, NSIC30, VSP6, Imelda) were subjected to participatory action research. The sweet potato cuttings were secured from IIRRs crop museum in SIlang Cavite which originally sourced over 16 varieties from the Phil Root crops research and training center in Leyte.

The strategy

On January 25, 2017, three (3) months after the establishment of the sweet potato propagation center, a Farmer's Field Day on Sweet potato was conducted. The activity was attended by 60 (Male19, Female 37) farmers and fisherfolks from nine (9) villages.

The result showed that NSIC SP 30 and NSIC 30 varieties were the most sumptuous to the participants in terms of sweetness while the VSP 5 variety has the most productive in terms of tubers. The VSP 5 variety is also the most appealing and more marketable compared to other varieties. After the taste-test, fifteen members of 1BOFA, three non-members from Basiao and 49 farmers from eight (8) villages enlisted their names and wanted to avail planting materials or sweet potato cuttings of their choice. The distribution will took place on the third week of February. A plan to set-up the same PVS in upland area was proposed.

The learning and sharing activity was followed by a taste-testing event were invited participants were able to share their thoughts on the six (6) varieties served.

Sweet Potato: Climate Smart and Nutrition Smart Crop

Sweet potato (camote) is both a typhoon tolerant and drought tolerant crop option. It's a crop that provides nutrition for home, for livestock, and as livelihood. Sweet potato trials are being undertaken using varieties obtained from Philippines Root Crops Research and Training Center (PhilRootcrops).

Health Benefits of Sweet Potato

What's New and Beneficial about Sweet Potatoes

Depending upon the variety, of which there are about 400, the skin and flesh of the sweet potato may be almost white, cream, yellow, orange, pink, or deep purple, although white/cream and yellow-orange flesh are most common. The intensity of the sweet potato's yellow or orange flesh color is directly correlated to its beta-carotene. Our bodies can typically produce vitamin A from the beta-carotene in orange-fleshed sweet potato; this is why this nutrient is often referred to as "Provitamin A."

Purple-fleshed sweet potatoes, on the other hand, are a fantastic source of anthocyanins (especially peonidins and cyanidins) and have outstanding antioxidant activity. Anthocyanin and other color-related pigments in sweet potato are equally valuable for their anti-inflammatory health benefits. Even the leaves of the sweet potato plant have been shown to provide important antioxidant benefits and are included in soups in many cuisines.

Orange-fleshed sweet potatoes may be one of nature's unsurpassed sources of beta-carotene. Several recent studies have shown the superior ability of sweet potatoes to raise our blood levels of vitamin A. This benefit may be particularly true for children.

Source: http://www.whfoods.com/genpage.php2pfriendly=1&tname=foodspices&dbid=64

3-4 months after, a Farmer's Field Day was conducted were farmers and fisherfolks from different barangays were invited. Sharon magnificently shared to them the results of the PAR. Participants also tasted some sweet potato that helped them identify what varieties they may choose to plant or propagate.

Key learnings from farmer learning groups

- One farmer said that the adoptable sweet potato varieties in coastal do not mean that the varieties will also be adaptable in the upland areas. Hence, PVS in the upland area using same varieties of sweet potatoes should be conducted.
- Sweet potato will not develop tubers when the shoots were disturbed during its growing stage because instead it exert its energy and nutrients harnessed in developing tubers, it will instead utilize them in producing its shoots/vegetative parts. Ms. Sharon Da-anton shared her experience in sweet potato where their group planted a year ago and noted that the plants developed more tubers despite that its vegetative parts taken regularly for food.
- Farmers learned that there are sweet potato varieties that developed tubers for only short period of time. Usually in their areas camote grows for almost 4-6months
- Imelda variety which was said to be a fast developer of tubers in the upland areas had a contradicting performance in the PVS conducted.
- It was also a first experience to the MAO Staff to have seen 13 camote varieties and did grow in the coastal area.
- Camote is best grown in slightly sandy loam soil

Organizing root and tuber crops farmer learning group to a farmer association

Harlyn Balbona, Agriculture Technician and Junedel Buhat, Livelihood Officer, Panay Learning Community, IIRR Philippine Program

The farmer learning group (FLG) in root and tuber crops in Ivisan, Capiz was organized into a farmer association (FA) during their meeting last April 24, 2017. 19 men and 45 women farmers attended the activity facilitated by IIRR staff, together with the Office of the Municipal Agriculture of Ivisan. A total of 22 men and women farmers were encouraged to organize and join the FA to receive better support for market opportunities and linkages. Other members of the FLG who didn't join the RTC FA were already members of separate FA for peanut growers.

During the meeting, the rules and obligations of the officers and members were discussed, followed by the election of officers as requirements for the formal registration at the Department of Labor and Employment (DOLE).

The newly-formed FA also agreed to contribute Php100.00 pesos as membership fee and initial fund for the processing of registration. The group also agreed to discuss the FA's Constitution and By-laws in their next meeting.

Next to coconut, RTC (ie. Sweet potato and cassava) is the second livelihood sources of the upland farmers in Ivisan. RTC and small livestock are promoted for livelihood diversification.

Improved husbandry, by establishing better housing structures and confined livestock raising

Small livestock growing such as goat in Ivisan is still traditionally tied and not confined. Farmers and fisherfolks have long experiences on how they feed and raise their goats. In this traditional method, common diseases occurred to goats includes worms, skin diseases and among others.

To further improve protecting and securing their small livestock as an asset, a PAR comparing the confined and unconfined livestock raising were conducted.

Farmer co-operators must have the following in place prior to the conduct of PAR.

1. Establishment of Intensive Feed Garden (IFG). Farmers or fisherfolks must plant and propagate feed gardens such as tricanthera, napier grass, madre de cacao, madre de agua. Feeds must be near to the housing in order to lessen the time of co-operators to feed the livestock.
2. In the establishment of housing, labor must be the counterpart of the co-operator. Materials on housing must be local.
3. Farmer co-operator must document all findings, observations or result to the Farmer Learning Group in order for them to learn the outputs or outcomes.
4. Farmer or fisherfolk must attend the regular FLG meeting and should report to the FLG and the institute any untoward incidence may occur.
5. Farmer or fisherfolk must re-disperse the number of heads provided to FLG members awaiting for the livestock.

Establishing Organic Vegetable Garden thru Community Innovation Fund

Last April 19, 2017, a total of 58 men and women farmers (27 male and 31 female) from 15 barangays visited the Organic Vegetable Garden with Protective Structure in Barangay Cudian in Capiz. The Organic Vegetable Garden with Protective Structure was established through the Community Innovation Fund or CIF under the Department of Agriculture's Adaptation and Mitigation Initiatives in Agriculture (DA-AMIA) Project. Juan Francisco, a farmer cooperator, owns the organic vegetable garden planted with eggplant, tomatoes, squash, okra, and high-value crops like pechay and lettuce.

Francisco shared his observations, experiences and learnings about his organic vegetable garden to the participants. He shared one of his farm management practices on preventing pest infestation through the use of Natural Attractant for Flying Insects or NAFI. NAFI is a natural concoction made from sweet coconut juice and rotting eggplant. Flying insects are attracted and trapped by the bottled fermented concoctions hung besides the vegetables. Thus, vegetable crops are not damaged. "Nowadays, we farmers should think critically, innovate and become observant in our farming practices to manage the changing climate and weather patterns. Otherwise, our farms will be affected", stressed Francisco.

Through organic vegetable gardening, Francisco was able to earn an approximately Php3,000.00($66 at 1USD=Php45.00) per week.

Some farmers committed adopting the protective structure technique to manage extreme sunlight and changing weather patterns.

Utilization of community innovations fund as mechanism for individual farmers to testing specific adaptation strategies using CRA – 12 sets of funded testing using CIF by around 26 farmers:

- **mussels/oyster production using raft method**
- **duck raising and vegetable production as additional livelihood for families with PWD members**
- **Trial use of protective structure**
- **Rice basal with green leaf manure (GLM)**
- **propagation of Upland rice varieties**
- **Native pig production**
- **Confined goat raising with IFG**
- **Rice applied with various organic fertilizers**
- **Propagation of Saline rice variety**
- **Squash in rainfed and idle rice field**

Insights and lesson to climate resilient agriculture programming

1. Local capacities for promoting CRA practices are already existing. CRA is already practiced by farmers to varying extent and some of past and current programs of DA/LGU can already be categorized as CCRA/CSA.

2. Capacities for highlighting CRA in current projects/ programs and farmer practices however is further enhanced if systematic and structured processes at local level are facilitated, especially in:

- identifying, characterizing, and documenting current CRA/CSA practices;
- learning from other stakeholders on their experience on their practice and experience;
- improving and intensifying current programs/ projects to highlight CRA components (e.g. climate perspective in organic program, demo farms)
- testing, documenting and sharing knowledge on new practices (through PAR)
- improving current extension programs that utilize farmer leaders to highlight and incorporate CRA

3. MAO/LGU also need guidance in facilitating abovementioned processes
4. Existing programs and services of LGU already provide the venue for facilitating CRA work among farmers.
5. CRA/CSA may be a new concept for local governments but one that they are somehow already familiar with as some of the CRA/CSA technologies being promoted are similar to past and current extension service (e.g. sustainable & integrated farming systems, CPAR).
6. Values formation is deemed also a must prior to engagement of the farmers

On mapping out CRA practices

1. There is no lack of CRA practice in the locality. Using indicators to map out current practices, local actors can easily list down current practices and describe why it is climate smart/resilient. There is a surprising huge number of practices within Capiz that have been sustained and are deemed capable for addressing identified climate-related issues.
2. The wealth of information on CRA/CSA practices in municipalities of Capiz is even surprising among MAO staff as they share experiences among themselves.
3. Documentation and characterization of current practices as CRA/CSA is however the key challenge as most local MAO staff have challenges in terms of writing/ documentation.
4. Documentation and sharing of existing CRA/CSA practices is identified by MAO & OPA as necessary if knowledge sharing between and among municipalities will be pursued. Guidance for this process however is needed.
5. Farm mechanization is identified as a key option to significantly increase farming productivity. It comes with some issues in terms of climate change perspective (e.g. greater carbon footprint due to higher use of fossil fuels) but there are benefits that may outweigh it. example of which is the introduction of mechanical harvester, which can significantly promote the practice of non-burning of rice straw and its re-incorporation into the soil during land preparation as it scatters the straw around the field.
6. Structured learning events such as roving workshops facilitated broadening of perspectives of farmers and allowed them to identify practices that they planned to test themselves.

On developing research and learning sites

1. Impact areas to fulfil its purpose as a learning site has to have at least 3 components:
   - having enough evidence of the practice in an easily accessible site;
   - farmers have good level of experience in the practice themselves and have documented the evidences of its benefits (estimated that 2 full cycles of experience would be sufficient); and
   - with farmer leaders serving as local knowledge resource)
2. Impact areas have very good potential for operationalizing and sustaining farmer-centered local extension systems. But sustainability mechanisms may also be needed (e.g. developing incentives to put value to opportunity costs of farmers performing as local resource persons)
3. Effectively utilizing impact sites for local extension systems, particularly relating to climate change, however also requires a structure process, initially defined by:
   - description of climate related issues and concerns being addressed (the reason/purpose for establishing impact sites)
   - description of identified strategies for addressing these issues (what farmers thought would work to address the issues)
   - learning agenda for the season/cycle (what is/are it? and what is/are its significance to the identified issues?)
   - key learning about the learning agenda, including description of activities conducted (what have the farmers done & learned?)
4. Establishing impact areas may not be feasible in one full cropping cycle, especially when targeting a specific number of practitioners who will provide the experience in a specific practice. This is particularly true to technologies and practices that are new/introduced and still in testing phase
5. Impact areas may however be feasible if the technology being promoted has been existing or practiced already in the locality. Best examples of which are the Ilaya Ivisan impact area (SRI/LEIRP) wherein there are 13 farmer leaders who are already capable of performing as resource persons; and in Cudian (raft method) where at least 15 fishers have years of experience in the practice.

Eight (8) sites are developing as impact areas, where significant number of farmers already have good experience in specific CRA practice. These are:

- Ondoy as LEIRP & peanut learning site – where at least 14 rice farmers have mature experience in LEIRP/SRI. Also within the barangay is a group of 15 upland farmers who have good experience in peanut production.
- Ilaya Ivisan also as LEIRP & peanut learning site – also with 13 LEIRP/SRI practitioners, and 29 peanut growers.
- Basiao as sweet potato impact area – where 13 farmers have engaged in PVS of sweet potato and are now propagating cuttings for the whole municipality
- Matnog as corn and peanut impact area – where 11 farmers have full season experience in corn production as alternate crop, also with 15 farmers engaged in peanut production
- Coastal areas in Cudian as impact area for raft method – where at least 15 fishers have good practice in raft method of shellfish farming
- Cudian as corn, peanut & LEIRP/SRI impact area – where 22 farmers have good experience in SRI/LEIRP, 11 in corn as alternate crop and 15 peanut growers.
- Mianay as Peanut impact area – where 19 farmers have good experience in peanut production
- Malocloc Sur as a developing impact area on vegetable production, where 16 farmers are trying out pineapple production

On approaches and strategies for further promotion of project-derived learning

1. There are five key drivers that facilitate local adoption (scaling out) of CRA practices at the local level:

   1.1. Facilitating better access of farmers to CSA/CRA knowledge & practice
   - Documenting and highlighting indigenous knowledge and practices that are already CRA/CSA (farmer practices); as well as research derived practices (from local research stations such as BAI, PhilRice, PhilRootcrops, WESVIARC, Aklan State University)
   - Establishing community support facilities (livestock breeding centers, crop propagation centers, small

ponds) that allow farmers access to materials and inputs
- Organizing farmer-centered knowledge sharing and exchange

1.2. Developing evidence base of CSA by documenting outcomes of project interventions in terms of addressing the identified climate-related issues. This is where the conduct of PAR with farmers have most value

1.3. Building on existing local programs and projects in order to incorporate CRA/CSA promotion

1.4. Investing in social capital such as in capacity building of local leadership that will sustain the program (particularly MAO staff and farmer leaders). this includes developing incentives (such as sponsoring learning opportunities outside the community)

1.5. Establishing infrastructures for CSA promotion such as Agro-Met stations and community support facilities/ Community Innovations Fund

2. Six social learning approaches are also relevant to facilitating resilience building at local level. These are:
   2.1. Mobilizing FLGS and facilitating the conduct of PAR
   2.2. Operationalizing CIF,
   2.3. Prioritizing and establishing community support facilities,
   2.4. Facilitating on-site learning (roving workshops & field days),
   2.5. Improving local extension systems, programs and projects for resilience building
   2.6. Developing impact areas

3. Three (3) approaches for wider promotion of project interventions (scaling up) beyond the community/ municipality level are:
   3.1. Media promotions
   3.2. Learning and sharing events such as forums and conferences
   3.3. Actual site visit for experiential learning for targeted audience (e.g. NGO partners & other MAO/PAO)

On mobilizing and organizing learning groups

1. Clustering was necessary, since project implementation started with existing groups, which was organized in a prior project for typhoon-recovery interventions.
2. Organizing research-related interventions under this project such as profiling commodity-specific risks/vulnerabilities, conducting PAR, and developing community support systems (propagation/ breeding centers and use of CIF) was a major challenge as these are at commodity-levels and thus need more detailed discussions and knowledge sharing (best in small groups)
3. Project's research character necessitates organizing smaller group of farmers (commodity-specific) as PAR constitutes more careful data gathering and analysis. organizing FLGs towards this end took longer process as mechanisms to organize sub-groups within clusters had to be developed.
4. Starting with clustering on the other hand facilitated wide reach of project interventions right from the start. The large membership of clusters provided captured audience for sharing and scaling out tested CRA technologies and practices.

On testing the community adaptation fund

1. Community support facilities such as propagation and breeding sites most cost-effective intervention and approach for scaling out CRA practices as farmers are easily convinced if provided first-hand information by fellow farmers.
2. Adoption of good farming practice is deemed as a function of providing sufficient technical information along with materials distribution/dispersal; as opposed to just distributing materials for project completion's sake. Best example of this is the initial experience of the farmers who were provided with goats provided their construction of goat confinement and housing as well as the establishment of intensive feed/forage garden. They are so far showing better husbandry practices compared to others who just received goats from a government goat dispersal program.
3. The CIF is serving as a mechanism also for development workers to track down and record status and outputs/ outcomes of project interventions. It requires its beneficiaries to identify specific roles to perform as his/her responsibility and part of the agreement.

Eleven community support facilities established (seven types):

- One (1) native chicken breeding center in coastal area as means to diversify livelihood of oyster/mussel producers especially during red tide, which occurred 2x in 2016
- One (1) native pig breeding center to increase availability of native pigs for dispersal schemes
- Four (4) small farm reservoirs (SFR) established, 3 in completion phase, in strategically located locations in upland rice producing areas. Each SFR irrigates paddies of 3-5 rice farming households.
- One (1) peanut propagation center – individual production of around 6 varieties of peanut with different desirable characteristics
- Two (2) Sweet potato propagation centers – 2 sites where 13 sweet potato varieties of different maturity are propagated and subjected to PVS. It now serves as source of cuttings for whole municipality.
- One (1) Saline Rice Varieties propagation center –trial farm where 4 varieties of saline rice from PhilRice and WESVIARC were subjected to PVS and now also serves as source of seeds for rice farmers experiencing salinity.
- One (1) Ginger and Turmeric Propagation for propagation of high value crops that are resistant to longer dry season.

IIRR Panay Learning Community Program
(Staff in Ivisan, Capiz)

Gonzalo S. Servano, Jr., IIRR Panay Learning Community Program
Farah Gaud A. Urdelas, IIRR Panay LCP Field coordinator
Junedel U. Buhat, IIRR Panay LCP Livelihood officer
Ivy S. Bermio, IIRR Panay LCP Research Associate
Harlyn V. Balbona, IIRR Panay LCP Agriculture Technician
Jonessa G. Vigo, IIRR Panay LCP Agriculture Technician
Ailyn G. Nicolas, IIRR Panay LCP Agriculture Technician
Ivy Z. Verdadero, IIRR Panay LCP Agriculture Technician
Royden P. Nicolas, IIRR Panay LCP local field facilitator
Sheela A. De Felipe, IIRR Panay LCP administrative assistant

Technical Advisers
Julian Gonsalves
Emilita Monville Oro
Rene Vidallo
Magnolia Rosimo
Jonna Jordan

Compilation / Design
Julian Gonsalves
Celso Amutan

Municipal Agriculture Office staff

Nilda N. Coopera, Municipal Agriculturist II
Susan M. Villa, Municipal Agriculturist II
Fatima F. Ocampo, Municipal Agriculturist II
Giovanni B. Lawag, Municipal Agriculturist II
Joed T. Urdelas, Meat Inspector
Nelly N. Ambuan, Agriculture Technician
Cara A. Simpson, US Peace Corps volunteer
Christin Joy de Asis, Clerk / Encoder

LGU partners:
Jose Noel N. Yap, Municipal Mayor
Felipe Neri N. Yap, SB Member
Engr/EnP Lorna L. Bernales, MPM, Municipal Planning and Development Coordinator

Other partners:
Western Visayas Integrated Agricultural Research Center (WESVIARC)
Capiz Research Outreach Station (CROS)
Philippine Root Crops
Capiz State University
Office of the Provincial Agriculture - Capiz
Department of Agriculture – Bureau of Animal Industry, Dumalag

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IIRR
INTERNATIONAL INSTITUTE OF RURAL RECONSTRUCTION

Philippine Country Program
Regional Center for Asia
International Institute of Rural Reconstruction
Y.C. James Yen Center, Silang, Cavite, Philippines 4118
Tel/Fax: (63-46) 430-0016

Website: www.iirr.org

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DEPARTMENT OF AGRICULTURE
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MUNICIPALITY OF IVISAN
PROVINCE OF CAPIZ