IMPACT EVALUATION OF THE AGRARIAN REFORM INFRASTRUCTURE SUPPORT PROJECT – PHASE III (ARISP-III) IN EASTERN VISAYAS

FINAL REPORT






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SUBMITTED TO:

NATIONAL ECONOMIC AND DEVELOPMENT AUTHORITY
REGIONAL OFFICE VIII
PALO, LEYTE

APRIL 2020

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ACRONYMS

AAD	Agriculture and Agribusiness Development
AIM-C	Agrarian Information and Marketing Center
APCP	Agrarian Production Credit Program
ARBO	Agrarian Reform Beneficiaries Organization
ARC	Agrarian Reform Community
ARCO	Agrarian Reform Cooperative
ARISP	Agrarian Reform Infrastructure Support Project
ASEMCO	Almeria Seafarer's Multi-Purpose Cooperative
BARC	Balaquid Agrarian Reform Cooperative
BAWUA	Balaquid Water Users' Association
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
BDCD	Beneficiaries Development and Coordination Division
BOD	Board of Directors
BOP	Basic Organizational Policies
CARPO	Chief Agrarian Reform Program Officer
CBU	Capital Build Up
CDA	Cooperative Development Authority
CIS/CIP	Communal Irrigation Systems/Projects
CPMO	Central Project Management Office
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DID	Difference-in-Difference
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
FeCARB	Federation of Cooperatives in ARCs
FGD	Focus Group Discussion
FMR	Farm-to-Market Road
FSSI	Foundation for a Sustainable Society Incorporated
GA	General Assembly
GoJ	Government of Japan
HARC	Hingatungan Agrarian Reform Cooperative
IA	Irrigators' Association
IDC	Institutional Development Coordinator
IDO	Institutional Development Officer
IE	Impact Evaluation
INFRADEV	Infrastructure Development
INSTIDEV	Institutional Development
IRR	Internal Rate of Return
JAWASA	Jamorawon Water Services Association
JICA	Japan International Cooperation Agency
KAP	Knowledge, Attitude and Practices
KARBC	Katipunan Agrarian Reform Beneficiaries Cooperative
KAWASA	Katipunan Water and Sanitation Association
KII	Key Informant Interview

LBP	Land Bank of the Philippines
LGU	Local Government Unit
MAO	Municipal Agriculture Office
MLGU	Municipal Local Government Unit
MPN	Most Probable Number
MSC	Most Significant Change
MTPDP	Medium–Term Philippine Development Plan
NEDA	National Economic and Development Authority
NFA	National Food Authority
NIA	National Irrigation Administration
NLDC	National Livelihood Development Corporation
NPV	Net Present Value
NSU	Naval State University
ODA	Official Development Assistance
OMA	Office of the Municipal Agriculturist
OMM	Operations and Management Manual
PARCOM	Provincial Agrarian Reform Coordinating Committee
PARFO	Provincial Agrarian Reform Program Officer
PCR	Project Completion Report
PEF	Peace and Equity Foundation
PHF	Post-Harvest Facility
PO	People's Organization
POW	Program of Work
PPMO	Provincial Project Management Office
PRDP	Philippine Rural Development Project
PSM	Propensity Score Matching
PSP	Policies, Systems and Procedure
PWS	Potable Water System
RIE	Rural Infrastructure Engineer
RMFP	Rural Microenterprise Finance Project
RPMO	Regional Project Management Office
RUWASA	Rural Water Supply and Sanitation Association
SARABCO	San Ricardo Agrarian Beneficiaries Cooperative
SEC	Securities and Exchange Commission
SME	Sustainability Monitoring and Evaluation
SPA	Sub-Project Agreement
TAPI	Technical Assistance Partner Institution/Individual
TEI	Technical Efficiency Index
TGP	Techno Gabay Program
TESDA	Technical Education and Skills Development Authority
VMGO	Vision, Mission, Goals and Objectives
WPD	Water Distribution Plan/Policy
WUA	Water Users' Association

EXECUTIVE SUMMARY

This report presents the results of the impact evaluation conducted on the Agrarian Reform Infrastructure Support Project – Phase III (ARISP-III) which was implemented in the provinces of Biliran and Southern Leyte. The ARISP-III was an integrated development project implemented by the Department of Agrarian Reform (DAR) in collaboration with the Local Government Units (LGUs), National Irrigation Administration (NIA), Department of Public Works and Highways (DPWH), Department of Trade and Industry (DTI), Department of Agriculture (DA), and Technical Assistance Partner Institutions/Individuals (TAPIs). The project was funded by the Official Development Assistance (ODA) under the Government of Japan (GoJ), through the Japan International Cooperation Agency (JICA).

The impact evaluation was done to attain the following objectives: (1) evaluate the achievement of the project's development objectives; (2) assess the benefits and gains and the impact of the project to the beneficiaries; (3) evaluate the effectiveness of the sustainability mechanism that was put in place; (4) develop a comprehensive impact evaluation framework and methodology to examine the relationship of the inputs, activities, outputs and outcomes of the projects to its impacts; and (5) identify and document innovative and effective approaches and strategies, including the lessons learned in the implementation of the project that could be adopted in the design or implementation of similar or relevant interventions in the future.

Mapping project inputs to project benefits was done following a modified impact assessment framework of Davis *et al*. (2008). Both primary and secondary data were utilized. Primary data were collected through focus group discussions with both project implementers and beneficiaries, key informant interviews, site visitation/ocular inspection, and in-depth survey of both project beneficiaries and non-beneficiaries across provinces using a pre-tested interview schedule. The non-beneficiaries served as the control group/counterfactual. A total of 228 ARISP-III beneficiaries and 150 non-beneficiaries were included in the survey. From these respondents, 70 beneficiaries and 54 non-beneficiaries were randomly selected samples who participated in providing input-output data and other information *before* the ARISP-III implementation.

Innovative quantitative and qualitative approaches were employed in estimating the impact of the ARISP-III in the project sites. The quantitative techniques included propensity score matching (PSM), difference-in-difference (DID) method, technical and productivity analysis using a stochastic frontier production function, factor share analysis, and benefit-cost analysis (BCA). On the other hand, the analysis of most significant change (MSC) stories was employed to identify qualitative indicators of project outcome/impact.

The ARISP-III had three main components, namely: (1) infrastructure development (INFRADEV), (2) institutional development (INSTIDEV) and (3) agriculture and agribusiness development (AAD). The estimated total project cost across provinces was a little over PhP196 million (in nominal value) and is equivalent to PhP213.3 million and PhP271.8 million in real and present values, respectively. The bulk of project investment (more than 98%) was incurred on infrastructure development. A total of 19 infrastructure facilities were developed across provinces. These comprised of

six communal irrigation systems/projects (CIS/CIP), five farm-to-market roads (FMR), five potable water systems (PWS), and three postharvest facilities (PHFs). The irrigation facilities provided service to a little over 400 ha, benefiting about 500 farmer-beneficiaries. Meanwhile, the FMR had a total scope of 18 km that directly benefited more than 4,000 individuals. On the other hand, the PWS structures benefited about 1,400 households. The PHF had a total land area of more than 750 sq m that supported three Agrarian Reform Cooperatives (ARCOs) in the project sites.

The INSTIDEV component facilitated the organization/strengthening of Agrarian Reform Beneficiaries' Organizations (ARBOs) in the project sites. It supported seven Irrigators' Associations (IAs), five Agrarian Reform Cooperatives (ARCOs), and five Water Users' Associations (WUAs). It conducted capability building activities for officers and members of ARBOs and facilitated the registration of about half of the ARBOs with the Securities and Exchange Commission (SEC), Cooperative Development Authority (CDA) and Department of Labor and Employment (DOLE). Furthermore, it succeeded in assisting the ARBOs to prepare the following written organizational documents: (a) Vision, Mission, Goals, and Objectives (VMGOs); (b) organizational charts, members' profile and minutes of meetings; (c) policies, systems and procedures (PSPs) for business and service; (d) operation and management manual; and (d) financial reports. In addition, the organizations were capacitated to produce their strategic development plan.

Meanwhile, the AAD component envisioned to increase farm productivity and income by helping primary cooperatives strengthen the members' farming technology through the establishment of demonstration farms, provision of appropriate trainings and enhancement of livelihood enterprises. It employed Technology Assistance Partner Institutions/Individuals (TAPIs) that took charge in coaching and mentoring the officers of primary cooperatives. Aside from TAPIs, the project actively involved the Municipal Agriculture Office (MAO), Department of Trade and Industry (DTI), and LGUs at the barangay, municipal and provincial levels. Likewise, the farmers were equipped with skills needed to develop the chosen enterprise through trainings and seminars. Through the AAD component, the primary cooperatives were able to engage in additional livelihood enterprises.

The project has employed effective approaches and strategies as well as sustainability mechanisms that helped ensure a relatively successful implementation. It has achieved its objectives of organizing and strengthening people's organizations, increasing productivity and farm income, improving the efficiency of commodity flow and mobility of people, and improving access to and availability of potable water, among others.

Some lessons learned are provided to guide the implementation of similar future development projects. Table 1 summarizes the major findings, conclusions and recommendations to sustain the gains and benefits of the ARISP-III.

Table 1. Major findings, conclusion and recommendations based on the impact evaluation of the Agrarian Reform Infrastructure Project – Phase III in Eastern Visayas

Major Finding	Conclusion	Recommendation	Responsible Agency
General The ARISP-III engaged in innovative strategies and mechanisms that provided infrastructure services and capability-building activities to the beneficiaries that were found beneficial to individual farmer-beneficiaries and ARBOs. The quantitative measures of positive outcomes/impacts of the ARISP-III were supported by the qualitative assessment.	As an integrated development project, the ARISP-III has been generally successful in achieving its objectives. It has contributed positively to the changes in productivity and net income of farmers over time. Moreover, it has improved the efficiency of commodity flow and mobility of beneficiaries as well as provided better access to and availability of potable water to the communities. Furthermore, it has organized and strengthened most of the people's organizations, increased patronage of members of ARBOs and improved the financial performance and status of the primary cooperatives.	Regular monitoring and continuous improvement among beneficiaries are needed to further improve and sustain the gains and benefits derived from the project towards achieving the goal of poverty reduction. The interventions provided by the ARISP-III can be replicated in other sites, incorporating the lessons learned and innovative approaches employed.	DAR, DA-LGU, NIA, DPWH

Infrastructure Development			
Communal Irrigation System/Project Improvement in the irrigation systems increased both irrigation and cropping intensities in the project sites. It also significantly increased the productivity and profitability of farmer-beneficiaries at least three years after project implementation. However, the average yield of palay across project sites was still below the regional and national standards. Moreover, the rate of increase in productivity is lower than the ARISP-III target from 2.89 to 5.0 mt/ha eight years after project implementation. The CIS/CIP also reduced conflict in the use of irrigation water.	The irrigation projects have contributed to the improvement in the farming, economic and social conditions of a great majority of the beneficiaries in both provinces. The improvement of the irrigation systems is considered by the beneficiaries as the most significant change as it enabled them to reap both economic and social benefits. The economic benefits can be improved by increasing farmers' technical efficiency and entrepreneurial skills as well as enhancing access to better markets.	Additional capability-building activities to help improve the technical efficiency and entrepreneurial skills of farmers as well as promotion of the use of hybrid palay seeds. Enhance access of farmers to better markets. The creation of Agrarian Information and Marketing Centers across provinces must be supported. Fast tract the rehabilitation of the damaged portions of the Jamorawon CIS in Biliran. Regular repair and maintenance of the CIS/CIP. Continuously engage in activitities (*e. g.* tree planting) to maintain and protect the watershed areas across provinces.	DAR, MLGU DAR, MLGU NIA, DAR, IA IAs DAR, NIA, MLGUs, IAs

<u>Farm-to-Market Road</u> The FMR component provided direct and unintended benefits to the beneficiaries in terms of reduction in travel time, increased mobility, ease in transporting goods, sense of security/safety in travel during the rainy season, support on local tourism as well as improved access to services and other livelihood opportunities. However, FMR project in San Ricardo, Southern Leyte was still incomplete. The roads were also narrow to accommodate bigger vehicles and the concrete pavements were just thin and easily damaged by inclement weather and by heavy vehicles. Not all MLGUs were able to fulfill their equity in-kind/scope of work in the FMR development project.	The FMR project has resulted in positive impacts on the living conditions of farmers across project sites. It has improved the efficiency of commodity flow and mobility of people as well as access to services and other livelihood opportunities.	Review the standards for FMR in terms of width, thickness, *etc*., to provide better and more lasting infrastructure to the people in the communities. Complete the construction of the FMR project in San Ricardo, Southern Leyte. Regular repair and maintenance of the FMRs. Compliance of MLGUs in Silago and San Ricardo in the counterpart/equity in-kind of constructing/ rehabilitating roads of the same scope in their localities.	DPWH DPWH, MLGU MLGUs DAR, MLGUs

<u>Potable Water System</u> The PWS increased the availability of piped water supply and reduced the dependence on spring and well as other sources of drinking water. It also significantly reduced time in fetching water. However, problems of insufficiency of water supply and low water pressure especially during dry season were encountered.	The PWS generally provided better access to and availability of potable water supply to the beneficiaries.	Regular monitoring of the PWS and WUAs. Regular repair and maintenance of PWS. Collection of commensurate user fee for proper maintenance of the water facilities.	DAR, MLGUs WUAs WUAs, DAR, MLGUs
<u>Post-Harvest Facility</u> Three primary cooperatives were provided postharvest facilities. The storage warehouses were also used as office space and meeting place of ARBOs as well as evacuation center during calamities. The use of solar dryer significantly reduced drying losses. However, utilization of the facility in Hingatungan, Silago, Southern Leyte was stopped. The facility was poorly constructed and defective which resulted in poor quality of milled rice. The PHF provided to the Balaquid ARC in Biliran proved beneficial in improving its palay trading business and in opening other agribusiness opportunities.	The availability of properly constructed postharvest facilities has improved the operations of most primary cooperatives as it provided bigger space for various uses especially for business purposes. It also provided opportunities for diversification of agribusiness enterprises.	Proper maintenance of the two functional PHFs. Repair of the defective drying facility in Hingatungan, Southern Leyte. Better supervision and regular monitoring in construction activities (of similar future projects), making sure that the construction plan is followed.	BARC, KARBC HARC, MLGU DAR, MLGUs

Institutional Development			
The ID component generally improved the management knowledge, attitude and practices of the ARBO officers and members. It facilitated the increase in patronage of members to their respective ARBOs and improved performance and financial status of ARBOs, particularly the primary cooperatives. Some ARBOs, however, failed to renew registration few years after the ARISP-III terminated.	The objectives of organizing and strengthening people's organizations was achieved. It has increased the patronage of members and improved the financial performance and status of ARBOs, particularly the primary cooperatives. However, sustainability was not developed in all of the beneficiary ARBOs.	Regular monitoring on the use of the recommended management practices must be done to ensure sustainability. Facilitate the renewal of registration of some ARBOs.	DAR, ARBOs DAR, ARBOs
Agriculture and Agribusiness Development			
The package of intervention provided by ARISP-III through the Institutional Development component improved the entrepreneurial competencies of the ARCOs. There was a general increase in the number of agribusiness enterprises developed, but only few of the developed enterprises were sustainable. The sustainability of agribusiness activities was affected by occurrence of calamities and choice of enterprises.	The project has developed additional agribusiness enterprises but only few were sustainable. The sustainability of agribusiness enterprises has been affected by the occurrence of calamities and choice of livelihood activities.	Conduct situational analysis as basis in choosing the enterprise to develop in each project site. Monitor the actual farm operations to ensure that farmer beneficiaries are following recommended farm practices.	DAR, MLGU, ARCOs DAR, MLGU

Sustainability Mechanism and Innovative Approaches			
The ARISP-III put in place some sustainability mechanisms that facilitated the construction/rehabilitation, utilization, and maintenance of infrastructure projects. It also adopted some innovative approaches which contributed to its relatively successful implementation.	The sustainability mechanisms and innovative approaches adopted by the project were relatively effective.	Adopt the approaches and strategies of inter-agency partnership/collaboration, raising of counterpart funds and employment of technical assistance partner institutions/individuals in the implementation of similar integrated development projects.	Lead and collaborating agencies

CHAPTER I
INTRODUCTION

1.1 Rationale

Development programs and policies are typically conducted to achieve change outcomes such as raising incomes, improving learning, reducing illness, increasing employment or increasing access to basic services. Whether or not these changes are actually achieved is a crucial policy question. Impact evaluation (IE) is vital in determining whether the project has generated its intended effects, as well as the level of outcomes and impacts it has brought to the intended clientele. It helps promote accountability in the allocation of scarce resources across projects and provide tangible evidences of positive benefits. It serves as an important tool in determining whether the project investments are efficiently allocated and provides information on returns from project investments.

Impact evaluations are part of a broader agenda using evidence-based policy making. Thus, results of IE studies are used by policy makers and funding/donor agencies as a basis for scaling up projects, as well as approval of future similar developmental projects from various agencies. One of these agencies is the National Economic and Development Authority (NEDA) which recognizes the importance of monitoring and evaluation in governance. Monitoring and evaluation are at the heart of evidence-based policy making. These provide a core set of tools that stakeholders and decision/policy makers can use to verify the quality, efficiency and effectiveness of any development project or policy.

The Agrarian Reform Infrastructure Support Project – Phase III (ARISP-III) was implemented to help attain the Medium–Term Philippine Development Plan (MTPDP 2004-2010) goals of poverty alleviation, agribusiness development, employment generation, and food sufficiency as well as the Thrusts and Priorities of the Department of Agrarian Reform (DAR). These development goals highlighted the provision of Philippine government in ensuring better quality of life for the Filipinos, especially the farmers. According to the National Anti-Poverty Commission (2006), farmers have the second highest poverty incidence (46.6%) among the basic sectors of the Philippine society. Hence, the major goal of the ARISP-III was to help reduce poverty and unemployment by developing agri-enterprises, making food plentiful and enhancing the enabling mechanisms for economic activities.

The ARISP-III was an area-based, participatory, inter-agency, multi-sectoral, and integrated development project that focused on three major components: (1) infrastructure development (INFRADEV), (2) institutional development (INSTIDEV) and (3) agriculture and agribusiness development (AAD). It developed basic infrastructures like community irrigation system/project (CIS/CIP), farm-to-market road (FMR), postharvest facility (PHF), and potable water system (PWS). Moreover, it provided organizational support and enabling technologies to the recipient Agrarian Reform Beneficiaries Organizations (ARBOs). Likewise, the project provided support to establishment of agribusiness enterprises through the provision of technical trainings/seminars, demonstration farms and extension services.

In Eastern Visayas, the project was implemented in the provinces of Biliran and Southern Leyte under the leadership of the Department of Agrarian Reform (DAR), in collaboration with local government units (LGUs), Department of Public Works and Highways (DPWH), National Irrigation Administration (NIA), Department of Trade and Industry (DTI), Department of Agriculture (DA), and Technical Assistance Partner Institutions/Individuals (TAPIs). The project was funded by the Official Development Assistance (ODA) under the Government of Japan (GoJ), through the Japan International Cooperation Agency (JICA).

Given the significant investment for the ARISP-III, there is a need to determine the gains and benefits it generated in the project sites. Studies assessing the positive impact brought by the ARISP-III project is very limited. There have been anecdotal evidences of the positive outcomes that the project created but as to quantifying the impacts, the literature is very limited. Hence, this impact evaluation study envisioned to map out the inputs of the project to its intended and unintended outcomes and measure its associated impact.

1.2 Objectives of the Impact Evaluation

Following the Terms of Reference with NEDA Regional Office 8 (NRO8), this project aimed to conduct an impact evaluation of the ARISP-III in Eastern Visayas. Specifically, it aimed to:

1. Evaluate the achievement of the project's development objectives;
2. Assess the benefits and gains (both planned and unplanned) and the impact (intended and unintended) of the project to the beneficiaries;
3. Evaluate the effectiveness of the sustainability mechanism that was put in place;
4. Develop a comprehensive impact evaluation framework and methodology to examine the relationship of the inputs, activities, outputs and outcomes of the project to its impacts; and
5. Identify and document innovative and effective approaches and strategies including the lessons learned in the implementation of the project that could be adopted in the design or implementation of similar or relevant interventions in the future.

CHAPTER II
REVIEW OF LITERATURE

There have been increasing interests in assessing the impact of developmental projects, in terms of whether these achieved the desired outcome of improving health, increasing affluence, improving learning or raising incomes. The robust evidence generated by impact evaluation studies is increasingly serving as a foundation for greater accountability on whether or not a particular program, project or policy has achieved its desired outcomes. The Philippine Institute for Development Studies (PIDS) and other agencies have been conducting several project evaluation studies of government policies and programs employing various methods in impact estimation.

This section presents some of the impact assessment studies conducted and methods used in evaluating programs, projects or policies relevant to the marginalized sector of the society. For instance, Kondo *et al*. (2008) used the difference-in-difference (DID) technique with a quasi-experimental design in estimating the impact of the Rural Microenterprise Finance Project (RMFP) in the Philippines. This method effectively controls for the known sources of biases namely: non-random program participation (sample selection), non-random program placement, and non-random drop-out. Findings showed that the program only benefited a limited number of the intended target since the majority of the existing clients and the incoming clients were found to be not poor.

Reyes *et al*. (2009) also determined the impact of rising prices of rice and fuel on poverty using two methods. On one hand, the net-benefit ratio (NBR) method was used in determining the impact of the increasing price of rice. The NBR is defined as the value of net sales of a commodity as a proportion of income. On the other hand, non-parametric techniques were used in studying the rise in fuel price. Results revealed that impacts vary across households according to income group, geographical location and urbanity level. Similarly, the NBR approach and nonparametric regression with density estimation were also applied in determining the impact of rice trade policy reforms on the welfare of Filipino households (Sobreviñas & Barrios, 2010).

Moreover, Briones (2013) studied the impact of the Department of Agriculture (DA) support services to the income of poor farmers and fisherfolks. He adopted the standard impact pathway approach involving input (activities), output (major final outputs), outcomes (increased production, more jobs, etc.), and impact (lower poverty and improved quality of life) in determining the net benefits acquired by farmers from the extension project. Ex-ante impact assessment was also done to evaluate the prospective impact of fruits and vegetables at the industry level R&D using ACIAR-PCAARRD horticulture project as case study (Briones & Galang, 2012). An economic surplus model was used in evaluating the project worth of the R&D investment. The model revealed that a high net present value, benefit-cost ratio, and internal rate of return will be realized if there will be increased investments in horticulture research and development (R&D).

Furthermore, impact of the conditional cash transfer program, also known as the *Pantawid Pamilyang Pilipino Program* (4Ps), on consumption was estimated using average treatment effect on the treated (ATT) through propensity score matching methodology (Tutor, 2014). Results showed that the program provided a significant

positive impact on education and clothing expenditures; however, it had no impact on health spending. The program was more pronounced among the poorest (fifth class households.

An econometric approach addressing problems of simultaneity, selection and censoring was done by assessing the impact of Bt corn adoption in the Philippines (Mutuc *et al*., 2012). In its empirical specifications, a bivariate probit model and a restricted profit function model (i.e. censored and uncensored model) were analyzed. Results revealed that Bt corn has significantly increased farmer's yields and profits. Inference error arises especially when censoring on pesticide application is ignored.

Several impact analyses on the Philippines' sectoral and regional policies were also carried out using the computable general equilibrium (CGE) model. For instance, the study of Briones (2015) on assessing the impact of national and regional policies used the CGE model (particularly, a bottom-up approach) with six (6) scenarios simulated. The quantitative assessment on the potential economic and poverty effects of the National Greening Program (NGP) of the Department of Environment and Natural Resources (DENR) also used the CGE model involving simulation in two broad (2) scenarios (Vista *et al*., 2016). In addition to the CGE model approach, propensity score matching (PSM) method was also applied in estimating the impact of the NGP intervention. A study of Corong *et al*. (2012) also employed a CGE model with micro-simulation methodologies in order to determine the impact of public infrastructure investments to the Philippine economy.

A farm-level impact assessment of the Techno-Gabay Program (TGP) across regions in the Philippines funded by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (DOST) employed productivity and technical efficiency measurement as well as factor share analysis. Results showed that TGP significantly improved farm productivity and technical efficiency as well as increased income of farmer-beneficiaries (Gabunada *et al*. 2011, Aveno *et al*. 2011, Narvaez and Narvaez 2011, Alimbuyuguen and Julian 2011, Mascariñas *et al*. 2011, Laureto *et al*. 2011, Bayacag *et al*. 2011, and Aquino, Ani and Bandoles 2011). Moreover, Gabunada *et al*. (2015) assessed the impact of the National Corn-Based Farmer-Scientists Research, Development and Extension Training Program (FSTP) employing both quantitative and qualitative approaches. The FSTP enhanced farmer-beneficiaries' knowledge, attitude, skills and adoption of improved corn production technologies as well as provided significantly higher technical efficiency, farm productivity and income compared to non-FSTP farmers. The analysis of the farmer-scientists' stories of significant change showed that the FSTP contributed to the improvement in the economic and social conditions of the farmer-clients. Furthermore, impact assessment of the Science and Technology-Based Farms (STBF) in the Visayas that involved various commodities employed benefit-cost analysis in determining the rate of return on STBF investments. The STBF projects were generally successful in demonstrating and promoting S&T interventions that resulted in increased yield and higher income of famers (Gabunada *et al*., 2019).

CHAPTER III
METHODOLOGY ‘

3.1 Impact Assessment Framework

An impact assessment framework is a description of how an intervention is supposed to deliver the desired results. It reflects the theory of change by describing and mapping how and why a particular project, modality or design will attain its intended (or unintended) outcomes. As one of the major steps in impact evaluation, mapping project inputs to outcomes is necessary before quantifying the impacts.

Similar to the impact evaluation of the Agri-Pinoy Livestock Program, this study adapted the impact assessment framework of Davis *et al*. (2008). The first component of the impact assessment framework is the identification of research, development and extension inputs. These inputs, in definition, are goods, services and resources provided for the project with an expectation that these will be converted into outputs and generate net benefits that are inclined with the project’s objectives. These inputs may be in cash and in-kind expenditures that are used by the project. In a project, funds are given to implementers by funding agencies (*e.g.* from the government, NGOs, private companies, *etc*.). These funds are utilized for maintenance and operating expenses, payment for personal services of the research team, and capital outlays of the project.

The determination of project outputs is the second component of the impact pathway. These outputs are specific by-products and services resulting from the utilization of inputs. There are different types of outputs depending on the nature of project. These outputs may be categorized into: (1) technology/services (*i.e.* new products, new processes, new approaches), (2) capacity built (*i.e.* new scientific knowledge and skills acquired by beneficiaries), and (3) policy (*i.e.* models and frameworks for policy and decision-making).

These project outputs can be brought forward for adoption by intended users. These can be adopted through: (1) commercialization (i.e. introduction of technology or new products in the market, provision of technical assistance, etc.), (2) communication (i.e. direct and indirect dissemination of information through media), (3) capacity building (i.e. building of knowledge and skills, through trainings, in order to facilitate adoption), and (4) compulsory or voluntary regulation (i.e. enforces or encourages beneficiaries to comply with certain procedures to avail services or incentives).

When utilized, outputs would result in project outcomes. These outcomes can be in the form of changes in practice, product and policy. Consequently, project outcomes lead to project impacts. These impacts could be in the form of economic, social and/or environmental. Economic impact is manifested through changes in income levels and productivity. Social impact can be seen in the improvements or reduction in health and security conditions of the community. Environmental impact is observable in the changes in air, water quality and biodiversityt. These impacts need to be valued and compared with project costs/inputs in order to determine the net benefits obtained from the project.

In summary, the first step in doing an impact assessment is to the review the project to be assessed. It is followed with the determination of inputs, and then outputs.

Next, adoption pathways of these outputs are assessed to identify project outcomes. With these outcomes, valuing and measuring of project impacts and net benefits are undertaken.

Figure 1 shows the impact evaluation framework that was adapted from Davis *et al*. (2008) and used in this study. The project inputs of the ARISP-III include both cash and in-kind expenditures provided by the Government of Japan through JICA and counterpart investments of partner/collaborating agencies that implemented the ARISP-III project. It implemented three (3) components, namely (1) INFRADEV, (2) INSTIDEV and (3) AAD. In terms of outputs, the ARISP-III generated two types: (1) infrastructure projects and (2) capacity built. The project provided capability building activities primarily in the form of trainings and seminars for individual member-beneficiaries as well as officers and members of the various ARBOs and facilitated the establishment of agribusiness enterprises. On the other hand, the INFRADEV component provided services related to CIS/CIP, FMR, PHF, and PWS.

As mentioned, these project outputs can be utilized by intended users/farmer-beneficiaries. For the ARISP-III, these have been facilitated through provision of mechanisms that ensured sustainability and proper utilization and maintenance of infrastructure projects as well as institutional development support, technical trainings/seminars, and mentoring/coaching by Technical Assistance Partner Institutions (TAPIs).

The utilization of services/interventions provided by the project resulted to project outcomes. For the ARISP-III, these outcomes are in the form of changes in practice and product. The improved irrigation services increased not only the agricultural production areas but also the cropping intensity. In addition, the FMR reduced travel time and increased mobility of farmers and other members in the community while the PWS improved people's access to safe water. Moreover, the INSTIDEV activities improved the management practices of ARBOs.

On the other hand, changes in product brought about by the ARISP-III interventions are in terms of: improved quality of palay/rice, viable agribusiness enterprises, reduced storage/drying losses, and improved personal entrepreneurial competencies of ARBO officers.

Lastly, project impacts are results of changes in practices and products arising from the utilization of services/interventtions provided. These are classified as follows: (1) economic, (2) environmental, and (3) social impacts. The economic impacts are in the form of increased productivity, improved financial performance and status of ARCOs, and increased farm income of beneficiaries. Meanwhile, environmental impact is in terms of increased availability of potable water among households. On the other hand, the social impacts relate to increased members' patronage of their respective ARBOs, reduced conflict on the use of irrigation water, increased efficiency of commodity flow and mobility of people as well as better access to services.

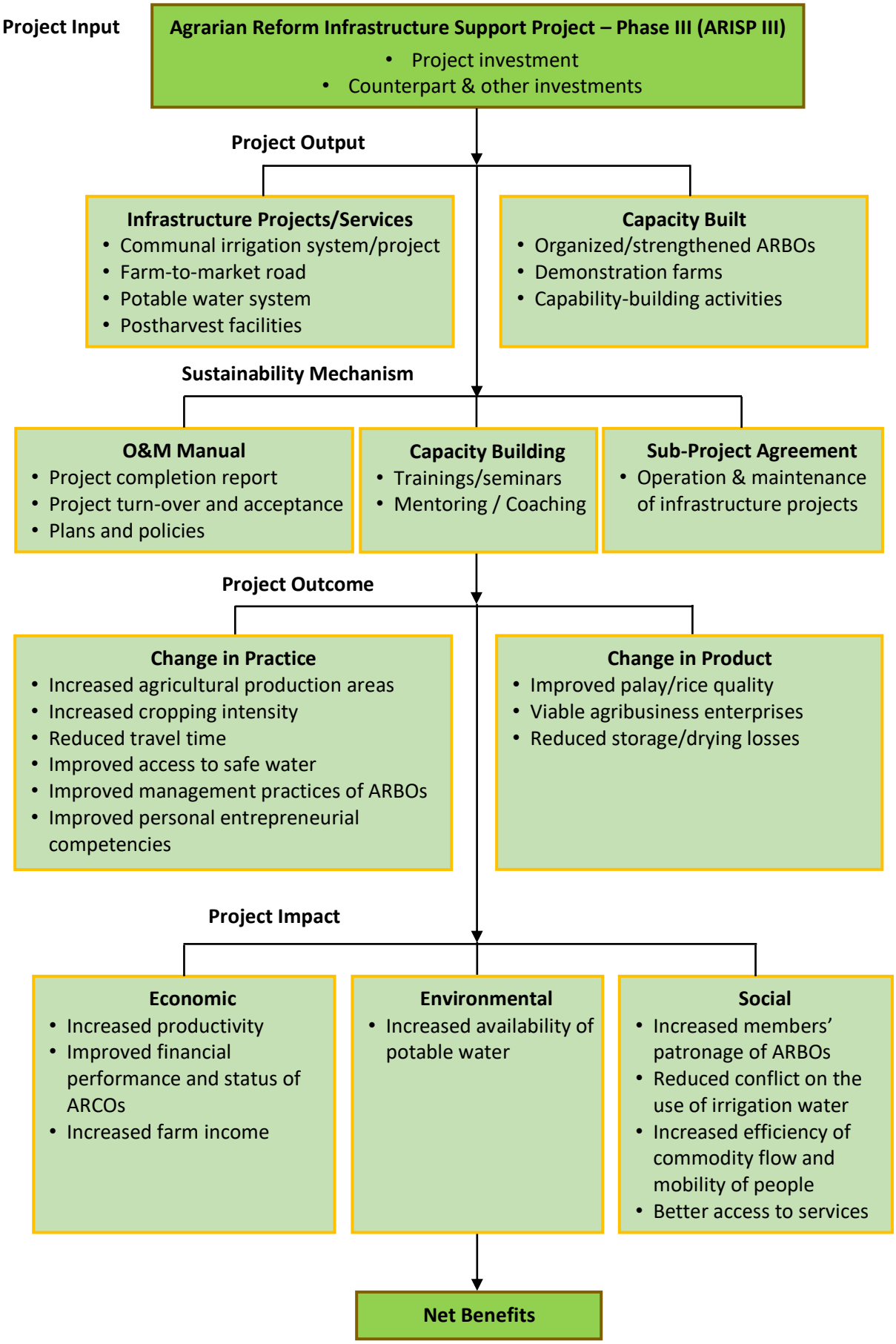


Figure 1. Conceptual framework for the impact evaluation of ARISP-III

3.2 Data Collection and Sources of Data

This study used both primary and secondary data. Primary data were obtained through focus group discussions (FGDs) with both project implementers and beneficiaries, key informant interviews (KII), site visitations/ocular inspection, and in-depth survey of farmers using pre-tested questionnaires. Meanwhile, secondary data were obtained from project completion reports and other related documents provided by the project implementers.

In impact evaluation, it is important to ensure that outcomes and impacts measured are causally linked to the project being assessed. One of the approaches to determining causality is the use of counterfactual; that is, estimating what would have happened in the absence of project intervention? The counterfactual was established by identifying control sites hence, sampling and data collection were based on two groups: (1) beneficiaries and (2) non-beneficiaries. Survey was primarily employed for both ARISP-III beneficiaries and non-beneficiaries. The sample beneficiary-respondents were drawn from the list of members of the Irrigator's Associations (IAs) that benefited from the irrigation facilities rehabilitated by the project. These included four IAs in Biliran and three IAs in Southern Leyte. The IAs in Biliran were as follows: Upper Iyusan IA, PulJamTam IA, Kasabangan-Balaquid IA, and MaLiBu IA. Meanwhile, the beneficiary IAs in Southern Leyte included Katipunan Silago IA, Hingatungan IA and San Isidro IA. On the other hand, the non-beneficiary respondents were identified members of two IAs each from Biliran and Southern Leyte that served as control sites. These included P. S. Eamiguel IA and Villacañeja IA in Biliran as well as Basaac IA and Lagiwliw IA in Southern Leyte. The identification of the control sites was primarily based on the similarities in geographical location, support from DAR and other agencies and presence of irrigation facilities that remained unrehabilitated during the time of assessment. This was made possible through the assistance of DAR personnel in both provinces.

The survey made use of pre-tested interview schedule and was administered by the research assistants and trained enumerators. Prior to the conduct of survey, courtesy call to the respective mayors and the respective barangay chairmen was conducted. Moreover, the consent of the respondents to participate in the survey was sought.

3.3 Sampling Procedure

The sampling procedure used in the study was probabilistic in nature. The following formula was used to determine the sample size using simple random sampling:

$$n_o = \frac{Z_{\alpha/2}^2 \sigma^2}{e^2}$$

where n_o refers to the sample size to be determined, $Z_{\alpha/2}$ is the standard normal deviate corresponding to the desired level of confidence, σ^2 is the population variance and e refers to the margin of error.

The study used a 99% confidence interval, which suggests that the sample is certain 99% of the time. The established Z-value for the 99% confidence interval is 2.585. With regard to the population variance (σ^2), there is no prior information available. Hence, the population variance was estimated using proportions. It was assumed that the

proportion was 0.5 since there is limited information available. A 0.5 proportion is a conservative assumption while a close to 1 proportion suggests best-case assumption. A conservative approach in estimating the required sample size is suggested when no prior information of the population variance is available. For the margin of error, a modest 5% assumption is used. The bigger the margin of error the lower is the sample size and the smaller the margin of error the bigger the sample size. Assumption on the margin of errors usually ranges from 1% to 10%. A smaller margin of error will require a large sample size. Using these assumptions, the sample size (n_o) was determined as follows:

$$\mathrm{n_o} = \frac{\mathrm{Z}^2_{\alpha/2}(\mathrm{p})*(1-\mathrm{p})}{\mathrm{e}^2}$$

$$\mathrm{n_o} = \frac{2.585^2(0.5)*(1-0.5)}{0.05^2} = 668 \text{ respondents}$$

Given the formula, result suggests to survey 668 respondents or households or farmers. However, it is necessary to adjust the computed sample size given that the population of the study is finite. To adjust the computed sample size, the following formula was used:

$$\mathrm{n} = \frac{\mathrm{n_o}}{1+\frac{\mathrm{n_o}}{\mathrm{N}}}$$

where n is the adjusted sample size, n_o refers to the initial sample size computed using equation 1 and N is the population under study. The population in the study is the total number of farmers for each of the municipality under study. Based on the available information, the total number of beneficiaries for the CIS/CIP is 473. Using equation above, the estimated sample size for the study area was computed as follows:

$$\mathrm{n} = \frac{668}{1+\frac{668}{473}} = 277 \text{ respondents}$$

Random sampling procedure was adopted using the MS Excel randomization scheme to make sure that everyone is given equal chance to be selected. Alternative farmers were drawn in cases where the first selected respondent was not available or refused to participate in the survey.

The desired sample size was 277 respondents. However, upon initial data tabulation there were respondents with missing information, with outlier values and other doubtful information included. To reduce the clutter in the survey, data cleaning was done to remove outliers (both super high values and super low values). After data cleaning, a total of 228 ARISP-III beneficiaries were included in the analysis. In addition, a survey among non-beneficiaries was also conducted to serve as comparison group. The randomly selected non-beneficiaries served as a *without project scenario* or a proxy on what would have happened without the ARISP-III interventaion. A random sample of 150 non-beneficiaries were interviewed across project sites (Table 2). Figure 2 shows the map of the sites covered in this study.

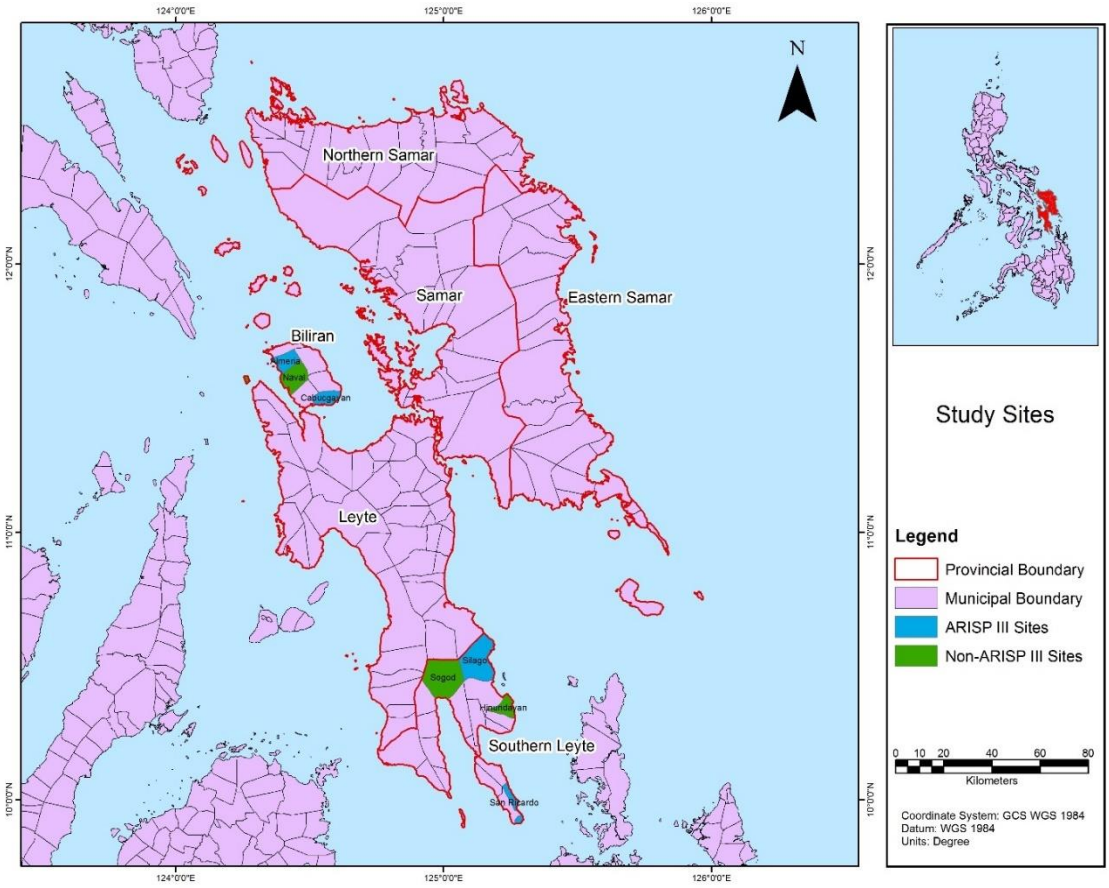


Figure 2. Map showing the municipalities and provinces included in the study

Table 2. Distribution of respondents by type and location, Biliran and Southern Leyte, 2018

Location	Type of Respondent				Total	
	Beneficiaries		Non-Beneficiaries			
	Count	%	Count	%	Count	%
Biliran						
Almeria	62	27.2	-	-	62	16.4
Cabucgayan	59	25.9			59	15.6
Naval	-	-	59	39.3	59	15.6
Southern Leyte						
Silago	107	46.9	-	-	107	28.3
Hinundayan	-	-	27	18.0	27	7.1
Sogod	-	-	64	42.7	64	16.9
Total	228	100.0	150	100.0	378	100.0

In addition, input-output data and other information *before* and *after* ARISP-III implementation were elicited from randomly selected 70 beneficiaries and 54 non-beneficiaries included in the full survey.

3.4 Analytical Tools

This section describes the tools of analysis that were used to address the issue on the counterfactual, measure the indicators of interest and achieve the objectives of the study. The World Bank Group introduced various methodologies in evaluating project impacts (Gertler *et al*., 2016). These methods include randomized assignment, instrumental variables, regression discontinuity design, difference-in-difference method (DID), and propensity score matching (PSM). Similar to the assessment of the Agri-Pinoy Livestock Program (APL-P) in Samar Island, the quantification of ARISP-III impacts employed DID and PSM. Other analytical tools employed were productivity and technical efficiency analysis, factor share analysis, and benefit-cost analysis. Moreover, analysis of most significant change (MSC) stories was done to determine the qualitative indicators of project impacts.

3.4.1 Difference-in-Difference Method

A crucial point in any impact assessment study is coping with selection bias, which arises due to systematic differences between households who are beneficiaries of the project and those who are not. If, for example, households in the treatment group are on average more educated and more affluent than those in the control group, the effect of any developmental interventions might be biased upwards, since education and income also have a (most likely positive) impact on the investigated outcome variables such as productivity and farm income. To control for this bias, the method of difference-in-difference (DID) approach was used.

The method of DID is a powerful, yet data intensive way of getting rid of the unobserved heterogeneity causing selection bias assuming that this unobserved heterogeneity is time invariant. For the ARISP-III impact evaluation, the method of DID involved the comparison of average *before-after* impact level for the beneficiaries and non-beneficiaries. The beneficiary group is referred to as the treatment group while the non-beneficiaries is the control group. A control group or commonly referred as counterfactual is needed in order to compare the changes in impact between those who were involved and not involved in the ARISP-III. By doing this, we can estimate the impact of the project as follows:

$$Impact = \frac{1}{n}\sum_{k=1}^{n}\left(O_k^{after} - O_k^{before}\right) - \frac{1}{m}\sum_{l=1}^{m}\left(O_l^{after} - O_l^{before}\right)$$

with *n* being the number of individuals in the treatment group, m being the number of individuals in the control group and O denoting the outcome investigated. To use regression analysis, the algebraic approach presented in the equation above is transformed into the following function form:

$$income = ß_0 + ß_1 impactDID + ß_2 beneficiary + ß_3 time + ß_i X_i + e \qquad (1)$$

where

income = outcome indicator
impactDID = interaction effect between beneficiary and time

beneficiary	=	dummy variable coded as 1 for beneficiary and 0 for non-beneficiary
time	=	dummy variable coded as 1 for *after* the project implementation and 0 for *before*
X_i	=	set of control demographic variables
e	=	residual term

The coefficient of interest is $ß_1$ as it reflects the impact of the project comparing the beneficiary and non-beneficiary and changes over time. A positive $ß_1$ implies that there is positive impact of the intervention suggesting that the outcome variable increased over time and its value is also higher than that of the control group. If $ß_1$ is also significant, then there is sufficient evidence to indicate that the estimated coefficient is statistically different from zero.

To provide an intuitive understanding of the measurements in quantifying the impact of the project, Figure 3 shows the difference-in-difference measurement. *Before* the intervention, the targeted beneficiaries and the control group already had an inherent difference. *After* the project intervention and if the desired outcomes were achieved, it can be expected that household beneficiaries of the ARISP-III will relatively have a higher outcome as compared to the control group.

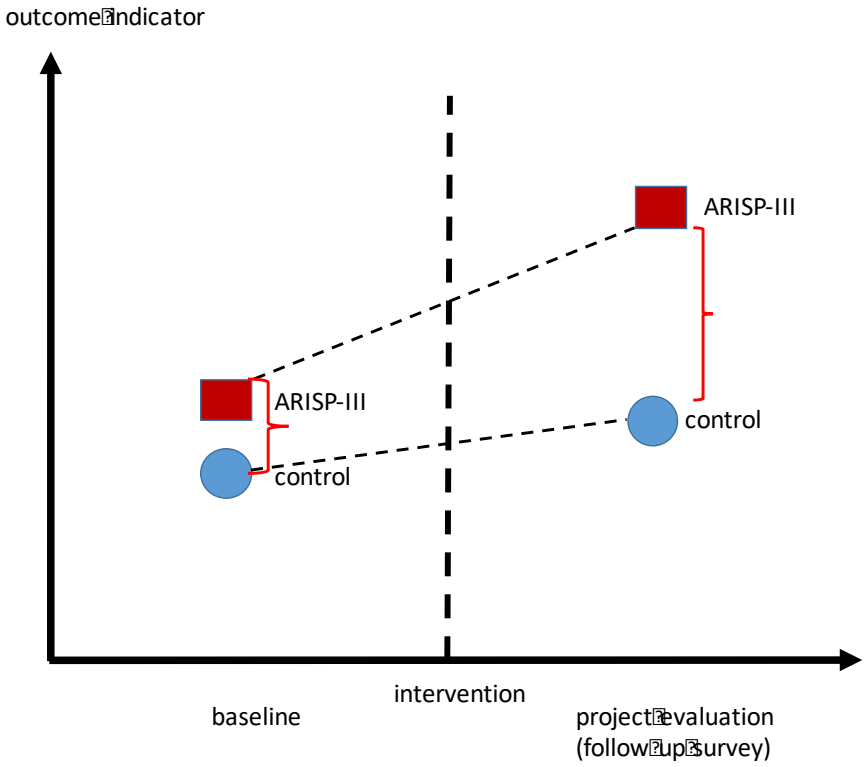


Figure 3. Difference-in-difference measurement

Notice that there can be changes or improvements in outcome of the control group. This captures the changes or improvements that the households were able to pick up from other sources or perhaps there is a general improvement in well-being across all sectors. To estimate the impact of the intervention, the change for control group over time is subtracted to the change in ARISP-III group over time. The time dimension

compares the situation *before* and *after* the implementation of the project. If the project implementation is good, it is hypothesized that the impact will be positive given that the desired outcomes are achieved. If in case the difference-in-difference measurement will give a value of zero, then it indicates that having the project and not having the project is just the same. And if the measurement is negative, the general well-being worsens *after* project implementation.

3.4.2 Propensity Score Matching

In the absence of a good baseline data, the method of propensity score matching was used to verify and quantify the impact of the ARISP-III on the socio-economic welfare of the project beneficiaries. Propensity score matching is a useful technique to reduce selection bias by matching similar households from the treatment and control groups using the so-called propensity score, which is defined as the estimated probability of receiving treatment.

When estimating the propensity score, a number of factors need to be taken into account. Covariates used for the estimation should satisfy two vital conditions. First, they should influence both the probability of receiving treatment as well as the impact. Second, they should not be changed by the treatment itself.

This research study adopted a non-experimental evaluation strategy in order to assess the impact of the ARISP-III in Biliran and Southern Leyte. Ideally, experimental data will provide information on the counterfactual situation addressing the problem of causal inference. However, this is not the case in these two provinces. Hence, the study employed a cross-sectional household survey to document changes in productivity and farm income among beneficiary and non-beneficiary group of farmers.

If the ARISP-III intervention was randomly assigned to households - as in the case of experimental approach – the impact of the project on households' socio-economic welfare can be directly computed as the difference in outcome variables between the treated group and the control group as follows:

$$\partial = E(Y^1_i - Y^0_i) \quad (2)$$

where ∂ is the average treatment effect and Y^1_i is the outcome of the treated group and Y^0_i is the outcome of the control group. A fundamental problem in estimating the causal effect in equation (1) is that Y^1_i or Y^0_i can only be observed once and not both for each household. It is impossible to find a household who belongs to both treated and control group. Formally, the observed case can be written as follows:

$$Y_i = T_i Y^1_i + (1 - T_i)Y^0_i, T = 0, 1 \quad (3)$$

Accordingly, the equation above can be rewritten as follows:

$$\partial = P*[E(Y^1|T = 1) - E(Y^0|T=1)] + (1-P)*[EY^1| T=0) - E(Y^0|T=0)] \quad (4)$$

where P is the probability of observing a household in the treated group (T = 1). This suggests that the effect of technology adoption for the whole sample is the weighted average of the effect of the two groups (treated and control). But then again counterfactual is not observed. The problem can be solved through different estimation techniques. Assuming that the effectiveness of the ARISP-III in improving productivity and income of farmer-beneficiaries in Biliran and Southern Leyte is a function of a wide range of observable characteristics, then it is possible to estimate the counterfactual by balancing the distributions of observed covariates between treatment group and control group. The balancing can be estimated using the similarities of predicted probabilities between the two groups (Mendola, 2007).

This requires the use of propensity score matching method in estimating impact of the ARISP-III. It might be valid to assume that there seem to be systematic differences between households who are beneficiaries of the project compared to non-beneficiaries. Therefore, it is advisable to construct more appropriate control groups, using propensity score matching. The basic idea of matching is to find for each household in the beneficiary group, a household from the non-beneficiary group which resembles the beneficiary households as closely as possible with regard to a chosen set of important socio-economic indicators such as age, education, farm size and others. An obvious problem here is the curse of dimensionality of the matching problem as the set of indicators grows large. A solution to this problem of multidimensionality is the use of propensity score matching, which reduces the problem to one dimension namely the so-called propensity score (Rosenbaum and Rubin, 1983). The propensity score (PS_i) can be interpreted as an estimate of individual *i*'s probability of receiving treatment. It can be estimated using limited dependent model such as logit or probit model. For this evaluation, the logit model of the following form was used:

$$P_i = E(Y_i = 1 \mid X) = 1 / (1 + e^{-z}) = ß_0 + ß_1 age + ß_2 male + ... + ß_{13} foodex + u_i \quad (5)$$

where

P_i	=	probability of a household being part of the beneficiary group
E	=	expected value of being in the project given the covariates
Y	=	1 if a household is an ARISP-III beneficiary and 0 for non-beneficiary
z	=	predicted value from the logit regression given the factors that affect being part of the program
$ß_0$	=	intercept
$ß_i$	=	regression coefficients
agehh	=	age of the household head (years)
malehh	=	gender of household head (1 if male and 0 if female)
educhh	=	years of education for household head
educsp	=	years of education for spouse
hhsize	=	household size
ownhouse	=	house ownership (1 if house is owned and 0 otherwise)
farmarea	=	farm area measured in hectares
waterdist	=	distance of households from the nearest water source
yrfarm	=	years in farming
ownland	=	land tenure (1 if farmers own the land they till and 0 otherwise)

assetindex	=	asset index deriving from pooling agricultural and household assets
inc4Ps	=	average monthly income received from 4Ps
foodex	=	average monthly food expenditure of the households
u_i	=	remaining error term

To match the treated and untreated observations, three well-established algorithms were employed, namely: kernel matching, radius matching and nearest neighbor matching. When applying kernel matching, each treated observation is matched with an artificial control, which is constructed from all observations, receiving different weights, depending on the distance of their propensity score from the score of the treated observation. Contrary to this approach, the nearest neighbor matching uses only one control observation (the one with the propensity score that is closest to that of the treated observation). Radius matching can be seen as a method lying somewhere in between. Here, the non-weighted mean of all controls within a defined distance (referred to as caliper) from the propensity score of the treated observation are combined to form a control observation (Klasen *et al*., 2011).

3.4.3 Technical Efficiency and Productivity Analysis

The interventions provided by the ARISP-III could have improved the processes used in the production system of palay farmers which in turn translates to improvement in farm output and consequently farm income. Improvement in farm income is a function of farm productivity while farm productivity is a function of technical efficiency.

Technical efficiency could be attributed to socio-demographic factors, institutional factors and involvement in the ARISP-III. Theoretically, farm output *with* ARISP-III intervention is higher than farm output *without* ARISP-III intervention (Figure 4).

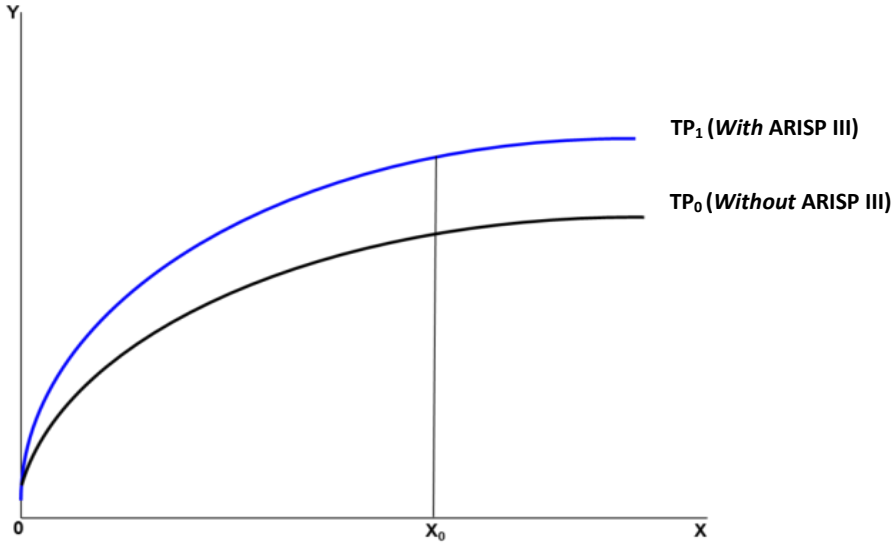


Figure 4. Theoretical relationship between the ARISP-III and farm output

Any production system has a potential yield depicting the frontier production function (Figure 5). Due to some reasons or factors, the farmer's production could lie below the frontier production. Since output of an ARISP-III farm is expected to be higher than *without*/*before* the intervention, the ARISP-III farm production function is expected to lie above the farm production function *without*/*before* intervention. The difference between the potential yield and the actual yield is called yield gap. This yield gap is due to inefficiency of production.

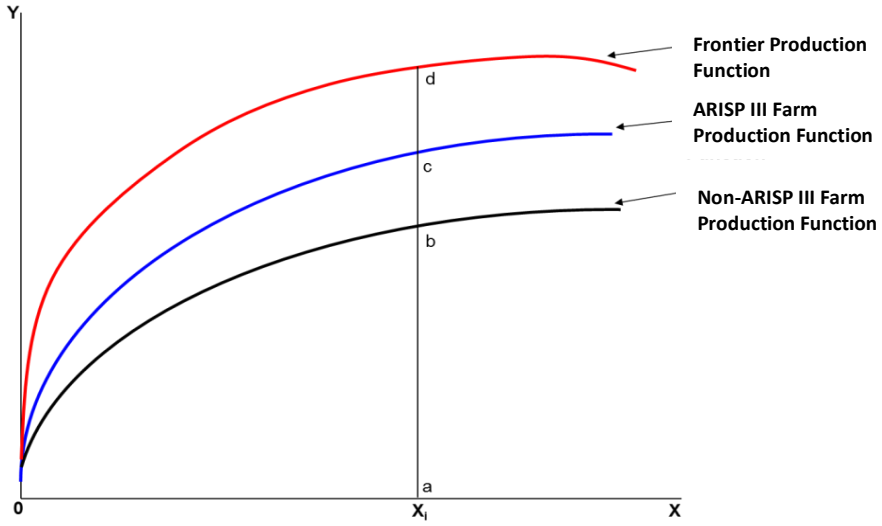


Figure 5. Graphical representation of frontier and farmer's production functions

From Figure 5, the technical efficiency of farm *with/after* ARISP-III intervention is measured as $\overline{ac}$ while the technical efficiency of farm *without/before* intervention is $\overline{ab}$. Meanwhile, the technical efficiency gap of the farm is $\overline{cd}$ while that of the farm *without/before* intervention is $\overline{bd}$ where $\overline{bd}$ is greater than $\overline{cd}$. This implies that the farm *with/after* ARISP-III intervention is more technically efficient than the farm *without/before* intervention.

Before and *after* approach to impact assessment was employed in analyzing technical efficiency and productivity using production function analysis. A production function is a physical relationship that shows the maximum amount of output that can be produced given a set of alternative combination of inputs and the underlying technology without any reference to market conditions or prices. Productivity refers to the amount of output produced from a given level of input. It shows the rate of output produced per unit of input used in the production process. Meanwhile, technical efficiency refers to the effectiveness with which a set of inputs is used to produce output.

Regression analysis was employed to estimate the production elasticity coefficients. If the production elasticity of an input is statistically significant, the differences in yield between farms *after* and *before* ARISP-III intervention is partly attributed to the variation in the level of said input, *ceteris paribus*. Meanwhile, if the coefficient of the ARISP-III variable is statistically significant, then the *a priori* hypothesis that the project is instrumental in improving farm productivity is proven.

Technical efficiency is the ratio of the farm's actual output to the technically maximum possible output at a given level of input. Farms *after* ARISP-III intervention can be more efficient than farms *before* ARISP-III intervention. They can produce more outputs given the same level of input than farms *before* ARISP-III intervention. In order to determine how far off a farm's yield is, on average, from the technically attainable yield, a frontier production function was estimated.

This study employed the regression model developed by Battese and Coelli (1995). This model specifies the frontier function while incorporating farm specific and other factors that can explain farm inefficiency (Aquino 2011). This stochastic production frontier and inefficiency effects model estimation hopes to solve the problem of attribution (those attributable to the project and those attributable to other factors). Hence, whether or not the ARISP-III related factors are able to reduce such inefficiencies can be determined using this approach.

Using the Cobb-Douglas production function, the stochastic frontier function and the linear form of the inefficiency effects model was expressed as follows:

Stochastic Production Function

$$\ln Y_i = \beta_0 + \beta_1 \ln X_{1i} + \beta_2 \ln X_{2i} + \quad + \beta_8 \ln X_{8i} + \theta DS_1 + \theta DS_2 + E_i \qquad (6)$$

Composed Error Structure

$$E_i = (V_i - U_i) \qquad (7)$$

Technical Inefficiency Effects Model

$$U_i = \delta_o + \delta_1 Z_{1i} + \delta_2 Z_{2i} + \delta_3 Z_{3i} + \delta_4 Z_{4i} + \omega_1 DT_1 + \quad + \omega_6 DT_6 \qquad (8)$$

Measure of Technical Efficiency

$$TE_i = \exp (-U_i) \qquad (9)$$

where:

Y_i = farm yield (kilograms per ha);
X_{1i} = quantity of seed used by the farm (kg per ha);
X_{2i} = total nitrogen nutrients applied to the farm (kg per ha);
X_{3i} = quantity of herbicide applied to the farm (mL per ha);
X_{4i} = quantity of insecticide applied to the farm (mLper ha);
X_{5i} = hired labor employed in the farm (person-days per ha);
X_{6i} = family labor employed in the farm (person-days per ha);
X_{7i} = animal-labor employed in the farm (animal-days per ha);
X_{8i} = machine (power) used in the farm (days per ha);
Z_{1i} = farming experience of the farmer (years);
Z_{2i} = total farm area (ha);
Z_{3i} = membership in farming-related organizations (number);
Z_{4i} = number of related trainings (years);
E_i = composed error structure;

V_i = independent and identically distributed N (0, σ_v^2) random error that captures statistical noise, measurement errors and exogenous shocks beyond the control of the farmer;
U_i = independent and identically distributed non-negative random variable that is obtained by truncations at zero of the N (μ, σ_u^2) distribution;
DS_1 = cropping season dummy (1 = dry, 0 = otherwise);
DS_2 = seed variety dummy (1 = hybrid, 0 = otherwise)
DT_1 = sex dummy (1 = male, 0 otherwise);
DT_2 = tenure dummy (1 = landowner, 0 = otherwise);
DT_3 = other support dummy (1 = with support, 0 = none);
DT_4 = credit dummy (1 = availed of credit, 0 = otherwise);
DT_5 = membership in cooperative dummy (1= member, 0 = otherwise)
DT_6 = involvement in the ARISP-III dummy (1= involved, 0 = otherwise)
β, θ = regression coefficients of Equation 1;
δ, ω = regression coefficients of Equation 3;
TE_i = technical efficiency index of the farm;
ln = natural logarithm; and the subscript i denotes the i^{th} farm in the sample

3.4.4 Benefit-Cost Analysis

Benefit-cost analysis (BCA) was done to determine the rate of return to the ARISP-III investments on CIS/CIP. Changes in productivity and income among beneficiaries for each CIS/CIP over time were quantitifed and valued. The incremental benefits were obtained by getting the difference in benefits generated *before* and *after* ARISP-III interventions based on survey data. The streams of investments/costs and benefits were measured over time. Aside from investments incurred during construction of the CIS/CIP, annual maintenance and operating costs were calculated. Real values of the costs and benefits were determined to remove price effects over time. Nominal values were deflated using the Philippine GDP deflator with 2018 as the base period (year when impact evaluation was conducted).

Meanwhile, the incremental benefits and costs were adjusted for the time value of money so that benefits and costs over time are expressed in their present values. The present values were obtained using 6% (recommended for development projects) and 10% rates of interest.

Three discounted measures of project worth were determined. These are net present value (NPV), benefit-cost ratio (BCR), and internal rate of return (IRR). NPV measures the present value of the streams of net benefits of the project. It indicates the amount by which the discounted benefits exceed the discounted costs. In order for the investment to be worthwhile, NPV must be greater than zero. Meanwhile, BCR gives the ratio between the present value of streams of benefits and costs. An investment is considered worthwhile if BCR is greater than one. On the other hand, IRR refers to the rate of interest or return that equates NPV to zero. It represents the investment return of the project. It corresponds to the interest earned from the investment or resources being committed to the project. An investment is considered worthwhile if IRR is greater than the cost of capital.

3.4.5 Analysis of Most Significant Stories of Change

Aside from the quantitative measures of ARISP-III impacts, qualitative indicators were also determined through the stories of change narrated by farmer-beneficiaries of the ARISP-III. The stories of change were gathered from farmer-respondents who agreed to tell about the significant changes they have experienced as a result of their involvement with the ARISP-III.

Story collection was done through various means, including personal interviews, focus group discussions, or informal conversations. To facilitate story collection, the research team used a story collection guide composed of the following parts: (1) background of the study; (2) contact details of the storytellers and the story recorders; (3) confidentiality conditions; and (4) guide questions for the storytellers. The questions were open ended to allow the storytellers to freely share information about the changes they experienced as a result of their involvement with the ARISP-III. These questions included the following:

1. *Tell me how you (the storyteller) first became involved with the ARISP-III. What is your involvement with the project? (PROBE: What services - i.e. infrastructure, trainings, technical assistance, information materials, etc. - have you accessed from the project?)*
2. *From your point of view, describe the most significant change that has resulted from your involvement with the ARISP-III.*
3. *Why is this change significant to you?*

To be able to produce the write-ups of the stories, the storytellers' narrations of their experiences were recorded, transcribed and encoded using word processing software. The stories were then grouped into domains or categories corresponding to the expected outcomes of the ARISP-III. After grouping, the stories were further subjected to thematic analysis to determine the specific kinds of change representing each of the identified domains. To determine the level of impacts of the ARISP-III as revealed by the stories of change, the stories were classified according to Bennett's Hierarchy of Program Outcomes (Sutherland and Leech, 2007) (Table 3).

3.4.6 Other Analytical Tools

Factor share analysis between *after* and *before* ARISP-III interventions was also employed to translate the technical impact to peso values. Moreover, t-test was employed to compare technical efficiency, productivity, factor shares, and income of farmer-beneficiaries *before* and *after* ARISP-III interventions.

Table 3. An adaptation of Bennett's Hierarchy of Program Evidence that was used as basis in analyzing levels of changes revealed in the project beneficiaries' stories of change

Level	Description
7	**End Results/ Changes in Conditions**: Changes in economic, civic, social conditions of the farmers *(i.e*., increase in yield or farm production, increase in income, improved livelihood, being able to send children to school, being able to acquire assets, *etc*.)
6	**Behavioral Changes**: Changes in the farming practices, decisions, *etc*. of the target groups (*i.e*., change in the rice-farming technologies used by the farmers, change in farm practices, *etc*.)
5	**KASA Changes**: Changes in **K**nowledge, **A**ttitude, **S**kills, and **A**spirations (*i.e*., increased knowledge about new rice farming technologies, change in attitude towards rice farming technologies promoted by the ARISP-III; e*tc*.)
4	**Reactions to ARISP-III:** Changes in the clients' opinion about the ARISP-III *(i.e*., the ARISP-III services)
3	**Involvement**: How many farmers participated in the ARISP-III activities, who participated, *etc*.)
2	**Activities**: What activities were developed or delivered (*i.e*., trainings/ seminars conducted, farm inputs shared to other farmers, *etc*).
1	**Inputs**: Changes in terms of what is invested (*i.e*. staff, time, funds, materials, equipment, technology, *etc*.)

CHAPTER IV
RESULTS AND DISCUSSION

4.1 The Agrarian Reform Infrastructure Support Project – Phase III (ARISP–III)

The Agrarian Reform Infrastructure Support Project – Phase III (ARISP–III) was implemented to help attain the Medium–Term Philippine Development Plan (MTPDP 2004-2010) goals of poverty alleviation, agribusiness development, employment generation, and food sufficiency. These development goals highlighted the provision of Philippine government in ensuring better quality of life for Filipinos, especially the farmers. According to the National Anti-Poverty Commission (2006), farmers have the second highest poverty incidence (46.6%) among the basic sectors of the Philippine society. Hence, the ARISP-III aimed to help reduce poverty and unemployment by developing agri-enterprises, making food abundant and enhancing the enabling mechanisms for economic activities. The project is also in line with the Thrusts and Priorities of the Department of Agrarian Reform (DAR).

The project's implementation was led by DAR with funding from the Offical Development Assistance (ODA) of the Government of Japan (GoJ) through the Japan International Cooperation Agency (JICA). The project was implemented by DAR in partnership with local government units (LGUs), Department of Public Works and Highways (DPWH), National Irrigation Administration (NIA), Department of Trade and Industry (DTI), Technical Education and Skills Development Authority (TESDA), Department of Agriculture (DA), and Technical Assistance Partner Institutions/ Individuals (TAPIs).

Specifically, the ARISP-III aimed to: (1) increase crop productivity in proposed irrigation service area from 2.89 to 5.0 tons per ha eight years after project implementation; (2) develop viable agribusiness/ rural enterprises/ livelihood through improved and appropriate technology, agribusiness linkages and provision of appropriate facilities; (3) organize and strengthen people's organization, as well as improve network between and among people's organizations, cooperatives in the Agrarian Reform Communities (ARCs), resource institutions and business partners; (4) improve the efficiency of commodity flow, as well as flow and mobility of people within, to and from the ARCs in support to agribusiness, livelihood and domestic activities; (5) improve availability of, and access to, potable water for domestic and small enterprises in the ARCs, and organize/ strengthen water users' associations to operate and manage the facilities; and (6) build upon and enhance existing project management and monitoring and evaluation system.

In Eastern Visayas, the project was implemented in the provinces of Biliran and Southern Leyte. It focuced on three major components, namely: (1) infrastructure development (INFRADEV), (2) institutional development (INSTIDEV) and (3) agriculture and agribusiness development (AAD). The INFRADEV involved the provision of basic infrastucture to improve productivity, mobility, and access to potable water, as well as provide facility for agribusiness. The infrastructure facilities included: (a) communal irrigation system/project (CIS/CIP), (b) farm-to-market road (FMR), (c) potable water supply (PWS), and (d) posthavest facility (PHF). Meanwhile, INSTIDEV involved organizing and strengthening of organizations and improved network between

and among people's organization (POs), cooperatives in the ARCs, resource institutions and partners. It also developed viable agribusiness/rural enterprises and livelihoods in the ARCs through improved and appropriate technology, agribusiness linkages and provision of appropriate facilities. Moreover, it helped build the capabilities of ARBOs to operate and manage the CIS/CIP, PWS and PHF. On the other hand, the AAD component facilitated the provision of technical assistance and establishment of demonstration farms to develop skills, introduce new technology, or expose farmers to alternative methods or approaches in agricultural production, livelihood enterprises, processing, and marketing. It envisioned to increase farm productivity and income through the cooperatives in the ARCs. The AAD included activities and interventions designed to improve or expand the production of crops, livestock and other agricultural resources as well as those that promote agri-based enterprise and livelihood that would result to an increase in value of agricultural products in the ARCs.

The ARISP-III was implemented in five Agrarian Reform Communities (ARCs) in the provinces of Biliran and Southern Leyte. The following ARCs were involved: (1) Almeria ARC in Almeria, Biliran; (2) Cabucgayan ARC in Cabucgayan, Biliran; (3) Hingatungan ARC in Silago, Southern Leyte; (4) Katipunan ARC in Silago, Southern Leyte; and (5) San Ricardo ARC in San Ricardo, Southern Leyte.

4.2 Project Inputs

The investments in the implementation of the ARISP-III were borne by the project and LGUs of the respective project sites. Table 4 shows the estimated nominal, real and present value of ARISP-III investments by project component and province from 2009–2017. Data used in calculating these expenditures were based on project completion reports and related documents as the audited financial reports were not made available to the research team. The estimated total cost of project implementation in both provinces was a little over PhP196 million (in nominal value). This is equivalent to PhP213.3 million real value (using 2018 as the base year) and PhP271.8 million present value.

The bulk of the expenditures on ARISP-III (more than 98%) was incurred on infrastructure development; more than 50% of which was allocated on FMR projects. This was followed by expenditures on CIS/CIP (31%). Meanwhile, the investment on INSTIDEV was spent on expenses for capability building activities such as food, materials, professional fees of TAPIs, and other logistics expenses. Similarly, the expenses on AAD component were incurred on various trainings conducted by DAR and LGUs. Moreover, some amount was spent on the establishment of demonstration farms that showcased the farming techniques promoted to the beneficiaries.

Table 4. Investments (in PhP) of the Agrarian Reform Infrastructure Support Project – Phase III (ARISP-III) in Eastern Visayas by project component and project site, 2009–2017

Project Component	Nominal Value			Real Value			Present Value (2018)		
	Biliran	Southern Leyte	Total	Biliran	Southern Leyte	Total	Biliran	Southern Leyte	Total
Infrastructure Development									
Irrigation	24,832,641.00	36,152,453.00	60,985,094.00	26,843,996.36	39,720,453.98	66,564,450.34	34,553,292.12	51,356,980.01	85,910,272.13
Farm-to-Market Road	34,182,747.01	61,054,254.00	95,237,001.01	38,324,838.38	65,116,546.14	103,441,384.52	53,300,396.95	78,441,357.59	131,741,754.54
Potable Water System	6,348,947.72	12,746,665.00	19,095,612.72	7,014.057.40	13,907,555.52	20,921,612.92	9,166,283.37	17,586,913.74	26,753,197.11
Post-Harvest Facilities	7,708,856.00	9,939,899.00	17,648,755.00	8,274,856.16	10,733,073.10	19,007,929.26	10,446,815.25	12,783,261.79	23,230,077.04
Agriculture and Agribusiness Development	761,283.84	780,319.00	1,541,602.84	789,877.40	866,164.59	1,656,041.99	837,270.05	1,167,615.40	2,004,885.45
Institutional Development	1,072,463.59	455,824.00	1,528,287.59	1,181,546.17	494,712.35	1,676,258.52	1,598,678.80	604,116.99	2,202,795.79
Total	74,906,939.16	121,129,414.00	196,036,353.16	82,429,171.87	130,838,505.68	213,267,677.55	109,902,736.54	161,940,245.52	271,842,982.06

4.3 Project Outputs

The primary outputs of the ARISP-III across provinces relate to the three major components, namely: (1) INFRADEV, (2) INSTIDEV and (3) AAD. The INFRADEV component was implemented by DAR in collaboration with several agencies. The development/rehabilitation of the various CIS/CIP was handled by the NIA while the FMR projects were constructed under the supervision of the DPWH. On the other hand, the PWS and PHF were improved and constructed, respectively, through the efforts of the respective LGUs. Moreover, the AAD component was implemented by DAR in partnership with the LGUs particularly the Office of the Municipal Agriculturist (OMA). The INSTIDEV component was implemented through the Technology Assistance Partner Institutions or Individuals (TAPIs).

The TAPIs tapped in Biliran were institutions. The Almeria Seafarer's Multi-Purpose Cooperative (ASEMCO) served as TAPI for the Almeria Agrarian Reform Cooperative (AARCO) while the Naval State University (NSU) was chosen as TAPI for the Balaquid Agrarian Reform Cooperative (BARC). Meanwhile in Southern Leyte, the TAPI chosen for the agrarian reform cooperatives were individuals instead of institutions. Mr. Conceso Ariola was chosen for the Katipunan Agrarian Reform Beneficiaries Cooperative (KARBC) and the Hingatungan Agrarian Reform Cooperative (HARC) in Silago while Mr. Wilson Apole served as TAPI for the San Ricardo Agrarian Beneficiaries Cooperative (SARABCO).

4.3.1 Infrastructure Development

A total of 19 infrastructure facilities were suported by the ARISP-III across project sites: nine in Biliran and 10 in Southern Leyte (Table 5). These comprised of six CIS/CIPs, five FMRs, five PWS, and three PHFs.

Table 5. Number and type of infrastructure facilities provided by ARISP-III by province

Infrastructure Development	Biliran	Southern Leyte	Total
Irrigation	4	2	6
Farm-to-Market Road	2	3	5
Potable Water Supply	2	3	5
Post-Harvest Facilities	1	2	3
Total	9	10	19

4.3.1.1 Communal Irrigation System/ Project (CIS/CIP)

Irrigation facilities were developed/rehabilitated in the project sites to provide steady supply of irrigation water that would improve farm productivity of beneficiaries in the covered ARCs. Four out of the six irrigation facilities developed/rehabilitated by the ARISP-III were located in Biliran. These included the Upper Iyusan CIP and Jamorawon CIS in the municipality of Almeria as well as Balaquid CIS and Cabucgayan CIS in the municipality of Cabucgayan. Meanwhile, the remaining irrigation systems

were located in Southern Leyte (Hingatungan CIS and Katipunan CIP in the municipality of Silago).

The irrigation infrastructure in the project sites provided service to a little over 400 hectares of rice farms (Table 6). These facilities benefitted about 500 farmer-beneficiaries who were primarily members of Irrigators' Associations (IAs) supported by the ARISP-III.

Table 6. Scope and number of beneficiaries of the communal irrigation system projects in Biliran and Southern Leyte

Item	Biliran	Southern Leyte	Total
Scope (ha)	207	202	409
No. of beneficiaries	255	242	497

Upper Iyusan CIP. The project included construction of diversion works to tap water from the Iyusan River, as well as structures and lining in 1.3772 km length of canals. It also included construction of turnouts and improvement of a road-crossing structure. It was expected to provide irrigation water supply to 46 ha of rice farms for the benefit of 74 Agrarian Reform farmer-beneficiaries. Some portions of the irrigation structures were damaged by Typhoon Urduja towards the latter part of 2017. These were rehabilitated and have since then continued providing service to the beneficiaries.

The downstream portion (left) and the upstream portion (right) of the main diversion structure

Some of the structures of the main diversion works, including a partly damaged reinforced concrete pipe

Portions of the main canal with concrete cover (left) and without cover (right)

Jamorawon CIS. The project involved repair and improvement of the canal structures, canal lining for 1.897 km of existing canals, nine farm level turnouts and two road-crossing structures. It covered a service area of 55 ha in barangays Pulang Bato, Jamorawon and Tamarindo (PulJamTam) in the municipality of Almeria, serving 60 beneficiaries of the PulJamTam Irrigators' Service Association, Inc.

At present, the system cannot provide water to all beneficiaries due to a substantial reduction in discharge. This was due to the collapse of a portion of the 65-meter flume during Typhoon Urduja; such was replaced only by two parallel 8-inch PVC pipes.

Some of the canal structures and turn-outs that were constructed

Some of the undamaged (left) and damaged but rehabilitated (right) portions of the canals

Portions of the canal that were destroyed by boulders during the landslide and Typhoon Urduja


The temporary (PVC-pipe) flume that replaced a portion of the original one destroyed during the landslide, clearly showing the reduction in the discharge volume

Balaquid CIS. The project involved the rehabilitation of the irrigation system that provided service to 53 hectares of rice farms. The infrastructure benefitted 61 members of the Kasabangan-Balaquid Irrigators' Association, Inc.


The main diversion structure of the Balaquid CIS

Some portions of the main canals of the Balaquid CIS

Cabucgayan CIS. The project included the construction of diversion works, canal structures and concrete lining for 0.6048 km of canal and nine turnouts. It covered a service area of 53 ha in three barangays of Cabucgayan: Magbangon, Libertad and Bunga (MaLiBu). The facility served 60 farmer-beneficiaries from MaLiBu Irrigators' Association.

The main diversion structure (left) and one of the turnouts (right) of the Cabucgayan CIS

Portions of the concrete-lined canals of the Cabucgayan CIS

Hingatungan CIS & Extension. The project involved construction of dams and rehabilitation (concreting) of existing earth canals to solve the problem of insufficient water for irrigation and collapsing of the earth canals. As a result, 75% of the canals were concreted and the irrigation project provided irrigation to 152.48 ha. The irrigation service benefited 151 members of two irrigators' associations: Hingatungan Irrigators' Association and San Isidro Irrigators' Association.

One of the dams (left) and a portion of the irrigation canal system (right) of the Hingatungan CIS

Katipunan CIP. The project provided a new dam and concrete canals as well as rehabilitated the old earth canals, serving about 50 hectares of farm land and benefiting 91 members of the Katipunan Silago Irrigators' Association. The new canals mostly followed the routes of the old canals. However, some portions (towards the ends of the distribution canals) were not concreted and were not able to serve the intended beneficiaries. Seepage along these earth canal portions may have caused significant water losses, such that some of the farms could not be served by the irrigation system.

As a result of this project, what used to be idle, cogonal lands were converted to rice farms. With available water, some beneficiaries were even able to raise vegetables, hogs, chicken and tilapia.

The Katipunan Irrigation Project

4.3.1.2 Farm-to-Market Road

Aside from irrigation facilities, the ARISP-III improved the existing FMR facilities in the project sites. This hoped to reduce the travel time, average transportation cost and hauling cost of farm products.

Five FMR projects were undertaken by the ARISP-III: two in Biliran and three in Southern Leyte. These included the (a) Pitogohan–Iyusan Road in Almeria, Biliran; (b) Sitio Kasabangan FMR in Balaquid, Cabucgayan, Biliran; (c) Gumamela–Infres in Hingatungan, Silago, Southern Leyte; (d) Katipunan–Catmon FMR in Katipunan, Silago, Southern Leyte; and (e) Pinut-an–Kinachawa PCCP in San Ricardo, Southern Leyte.

The FMR facilities across sites had a total scope of about 18 kilometers (Table 7). Those in Southern Leyte covered about twice the scope in Biliran. Overall, the facilities directly benefited more than 4,000 individuals, over half of whom (53%) were serviced by the Gumamela–Infres road in Silago, Southern Leyte.

Table 7. Scope and number of beneficiaries of farm-to-market road projects in Biliran and Southern Leyte

Item	Biliran	Southern Leyte	Total
Scope (km)	6.1	11.8	17.9
No. of beneficiaries	956	3,125	4,081

Pitogohan–Iyusan FMR. The project involved concreting a 4.4 km-road from the junction of the national highway to Sitio Pitogohan in Brgy. Iyusan, Almeria, Biliran. This directly benefited about 400 individuals.

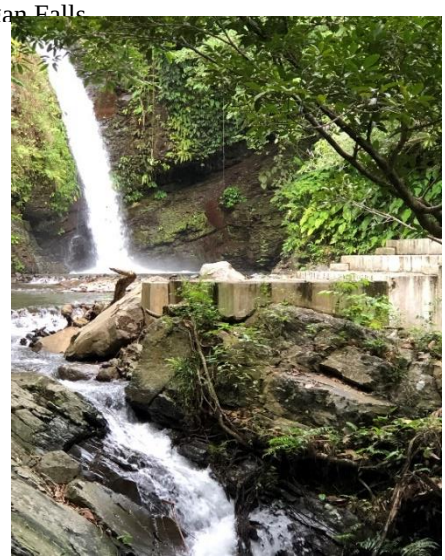
The Pitogohan-Iyusan FMR entrance marker and the sloping portion of the road at the entrance showing damaged portions

Waterlogged and damaged portion of the Pitogohan-Iyusan FMR near an existing culvert

Sitio Kasabangan FMR. The project involved concreting of 1.7 km of road from the national highway to Sitio Kasabangan in Brgy. Balaquid, Cabucgayan, Biliran. The road was generally well-constructed, except for some portions with very steep slope and minor-damaged surfaces. Aside from being used for the transport of farm products and supplies, the road hastened eco-tourism development in the area, as it led to the trail of the Kasabangan Falls.

Some portions of the Balaquid FMR near the entrance marker

The end of the FMR is the starting point of the trail to the eco-tourism destination, Kasabangan Falls



The Eco-Tourism Park, Kasabangan Falls

Gumamela–Infres. The project was a 2.96 km gravel-surfaced road with concrete segments on critical slopes. Despite its inadequate quality, the road has served the constituents of the intended communities. The respondents attributed improved accessibility to and from the surrounding communities and the decrease in transport cost of farm products to the project.

Portions of the Gumamela–Infres FMR, with concrete-paved portion on a critical slope

Katipunan–Catmon FMR. The project was a 5.10-kilometer concrete road from the national highway junction in Barangay Katipunan to Barangay Catmon. Among the road projects, it incurred the highest cost (PhP31.2 million). It was quite an improvement from the original rough road that was mostly used by carabaos and horses, and almost not passable by jeepney. The road was of good quality and directly served 623 individuals.

The Katipunan - Catmon Proper Farm to Market Road

Pinut-an–Kinachawa PCCP. The project was planned to provide 3.74 km of concrete road from Barangay Pinut-an to Barangay Kinachawa of San Ricardo, Southern Leyte. It ranked second in terms of investments among the road projects (PhP26 million). As mentioned by key informants, the contractors have already been paid more than what have been accomplished. The present mayor decided to take over the project because if legal actions will be taken against the previous contractors, the project will be delayed further because it can only be resumed after such legal action will be resolved. The FMR is only about 83% completed.

The Pinut-an-Kinachawa FMR showing water-logged portions, collapsed pavement and poorly constructed portions that exposed the coarse aggregates

There were a lot of concerns raised by the intended beneficiaries of the project. One was the very poor quality of some portions of the road. There were portions of the road where the coarse aggregates were exposed to the surface after the cement-sand portions of the concrete were eroded, indicating that the contractor did not follow the specified concrete mix for the project. This has been reported by the DAR project monitoring staff who even recommended removing and replacing these portions of the road.

Another problem raised was the construction of a spillway instead of a bridge or box culvert. It was mentioned that the reason for the choice of a spillway (over that of a bridge or culvert) was to maximize the total length of road for the given budget. Some respondents mentioned that the design failed to consider the expected volume of water that passed through the spillway.

In another portion, the concrete pavement gave way when heavy vehicles passed. This could be the result of not putting culverts in the low-lying water-logged portion of the road, which caused runoff water to seep through the soil under the concrete road. This made the soil very soft, causing collapse/breaking of the pavement when heavy vehicles passed.

The total length of the road was shortened because of a variation order in the contract that required removing or excavating a substantial portion of a mountain side to reduce the very steep slope of the road to within acceptable limits. This change in the scope of work incurred additional costs that had to be compensated by a reduction in the total length of the road project. The project directly benefited more than 300 individuals.

4.3.1.3 Potable Water System

The provision of PWS was envisioned to improve access to, and availability of, safe and potable water in the ARCs. Five PWS structures were improved across provinces: two in Biliran and three in Southern Leyte (Table 8). These included (a) JAWASA PWS in Almeria, Biliran; (b) Balaquid PWS in Cabucgayan, Biliran; (c) Hingatungan PWS in Silago, Southern Leyte; (d) Katipunan PWS also in Silago, Southern Leyte; and (e) Looc–Kinachawa PWS in San Ricardo, Southern Leyte.

The PWS structures benefited about 1,400 households in both provinces, 60% of which were located in Southern Leyte (Table 7).

Table 8. Number of beneficiaries of the potable water system projects in Biliran and Southern Leyte

Province	Number of Beneficiary-Households
Biliran	562
Southern Leyte	827
Total	1,389

Jamorawon PWS in Almeria, Biliran. The project involved a rehabilitation and improvement of the main distribution lines and laterals of the existing PWS managed by the Jamorawon Water Users' Association (JAWASA). The intention was to extend coverage of the PWS to households that were not reached by JAWASA-managed PWS. Through the ARISP-III, two additional main outlet pipes are now operational. In addition, another outlet pipe, which was used temporarily to supply water to a neighboring barangay after a typhoon, is still being used because the affected residents of said barangay requested to have continued service even if their barangay's water system was already operational. The system also provides a communal potable water to residents of a newly established housing project in the area. *Before* the ARISP-III, the JAWASA-managed PWS was able to serve 314 households. With the improvements done through the ARISP-III, the PWS is currently serving more than 400 households in Jamorawon and a neighboring barangay.

The reservoir showing the intake pipe (left) and the three (3) outlet pipes (right) after the ARISP III project

The portions of the reservoir showing the outlet pipe (left) for another barangay and the new connection (right) to supply water to a new housing project

Balaquid PWS. The project involved construction of a spring intake box, a reservoir, pressure brake chambers, and pipelines from the reservoir to the service area tap stands and public faucets. When it was completed, it was able to serve more than 200 households in the barangay. However, when Typhoon Urduja hit Biliran province in December 2017, the water source and some of the distribution pipes were destroyed, resulting in a great reduction in the volume of water supplied to the water users. Thus, after Typhoon Urduja, the PWS was able to serve only the people in the barangay proper of Balaquid.


The Balaquid potable water system reservoir


The main pipe from the reservoir (left) and an existing tap stand beside the road (right)

Hingatungan PWS. The project involved improvement of an existing water system that used smaller pipes (3-inch main pipes) in its distribution lines, which benefitted 510 households. It provided a new reservoir with 3-inch and 4-inch outlet pipes and communal tap stands serving as much as six households each.

During the assessment, the reservoir and tap stands were no longer used. The barangay waterworks association that managed the system allowed connections to the households and bypassed the newly constructed reservoir. Tap stands were already condemned as the households got connected to the distribution lines. The reservoir was bypassed and the association connected the main pipes directly to the source (about 2 km from the reservoir) to increase water pressure in the households.

Some key informants mentioned that when the reservoir was used, water stored overnight was not enough for the users during the day, and the pressure was not enough. The low pressure was attributed mainly to the fact that the reservoir was constructed at a

site with elevation lower than what was originally planned. Moreover, it was mentioned that since the system was designed to provide water up to the tap stands only, the pressure at the original reservoir site was much higher than what was needed for the tap stands, hence the decision (of higher authorities in Manila) to relocate the reservoir to a site of lower elevation. Furthermore, it was revealed that poor workmanship by the contractor, particularly on the couplings along the mains and laterals, may have also contributed to some losses in water pressure and volume.

The reservoir of the Hingatungan Potable Water System showing two sizes of outlet pipes

Katipunan PWS. The project involved construction of a reservoir and two break-pressure chambers intended for level II use, with tap stands serving 5-6 households. It was completed but was not used according to its intended purpose because the water was found not potable and some beneficiaries were able to install connections direct to their households. Because of the non-potable water, the system provided water for cleaning and uses other than for drinking to 156 households. A school actually got connected and benefitted from the system.

The main reason for the poor water quality could be the location of the intake pipe, which was in a gully that was directly along the path of flowing water when it rained. Sediments and particles from organic matter in the slopes easily entered the water system through the water flowing through the gully passing through the intake pipe.

Components of the Katipunan Potable Water System

Looc–Kinachawa PWS. The project involved rehabilitation of the existing water system, repair of the existing reservoirs, replacement of main pipes (including laterals) and provision of connections to households (instead of tap stands). The project was originally intended to provide tap stands only but the residents wanted individual household connections so the scope of work was changed. Instead of providing tap stands, hoses were utilized to provide direct connections to the households. While some tap stands were still in use, most of the households already have individual connections.

A reservoir and a tap stand at Barangay Looc

Resevoirs and and pipe connections to the households in Barangay Kinachawa

4.3.1.4 Postharvest Facilities

Another important infrastructure provided by the ARISP-III in both provinces were postharvest facilities (PHFs). These were in the form of storage warehouses and solar drying facilities. Three PHFs were constructed: one in Cabucgayan ARC and two in Silago ARC. These represented one set of PHF for each of the three Agrarian Reform Cooperatives in the project sites, namely: (1) Balaquid Agrarian Reform Cooperative (BARC) in Cabucgayan, Biliran; (2) Hingatungan Agrarian Reform Cooperative (HARC) in Silago, Southern Leyte; and (3) Katipunan Agrarian Reform Beneficiaries' Cooperative (KARBC) also in Silago, Southern Leyte.

The PHFs across provinces had a total land area of more than 750 sq m and expected to benefit over 700 members of the above-mentioned primary cooperatives (Table 9).

Table 9. Scope and number of beneficiaries of the postharvest facilities in Biliran and Southern Leyte

Item	Biliran	Southern Leyte	Total
Scope (sq m)	646	108	754
No. of beneficiaries	120	591	711

Balaquid PHF. The facility consisted of a building with a floor area of 154 sq m that served as warehouse and office and a 492-sq m sun drying pavement of the Balaquid Agrarian Reform Cooperative. The facility had a maximum storage capacity of 3,500 cavans of paddy rice.

The Balaquid Post-Harvest Facility building and sun-drying pavement

The Balaquid Post-Harvest Facility serving as warehouse for rice-trading and storage for processed farm products

Hingatungan PHF. The project included the construction of a building for storing farm products with a pavement for sun drying. The building was used as storage for farm product, agricultural supplies and machinery. The pavement was no longer used because the concrete surface plastering was scraped off. According to the key informants, the original pavement was very rough and the beneficiaries complained about it. The contractor later added smooth plastering on the surface but several portions eventually got separated from the rough concrete base. Farmers did not use anymore the facility because the palay dried there would contain dirt and small fragments of the loosened concrete surface, affecting its quality.

The Hingatungan Post-Harvest Facility building and a portion of the sun-drying concrete pavement with detached surface plastering

Katipunan PHF. The project consisted of a building and a concrete pavement for sun-drying of farm products. Both the building and the pavement appeared to be constructed according to the plans and were fully functional. The building served as storage for palay and some farm supplies and farm implements, although not all beneficiaries were able to use the facilities.

The Katipunan Postharvest Facility building and sun-drying pavement

4.3.2 Institutional Development

The INSTIDEV component was designed to organize and strengthen people's organization and improve network between and among people's organization, cooperatives in the ARCs, resource institutions and partners. This facilitated the organization and strengthening of Agrarian Reform Beneficiaries' Organizations (ARBOs) in the project sites. The focus organizations for this project component were the Irrigators Associations (IAs), the Agrarian Reform Cooperatives (ARCOs) which were the Primary Cooperatives and the Water Users' Associations (WUAs) in the different ARCs. There were 17 ARBOs supported by the ARISP-III: eight in Biliran and nine in Southern Leyte (Table 10). They were classified as IAs, ARCOs and WUAs. A considerable proportion (40%) of the ARBOs were IAs.

Table 10. Number of agrarian reform beneficiaries' organizations supported by ARISP-III in Biliran and Southern Leyte

Type of ARBO	Biliran	Southern Leyte	Total	Percent
Irrigators' Association	4	3	7	41.2
Agrarian Reform Cooperative	2	3	5	29.4
Water Users' Association	2	3	5	29.4
Total	8	9	17	100.0

The IAs which were beneficiaries of the communal irrigation projects or systems need to properly operate and maintain the communal irrigation systems entrusted to their management, hence, it is very important that they handle their responsibilities efficiently and effectively. In Biliran Province, four IAs were included in the impact assessment, namely: (1) Upper Iyusan Irrigators' Association and (2) PulJamTam Irrigators' Association from the municipality of Almeria as well as (3) Kasabangan-Balaquid Irrigators' Association, and (4) MaLiBu Irrigators' Association from the municipality of Cabucgayan. In Southern Leyte, three IAs from the municipality of Silago were covered by the assessment, namely: (1) Hingatungan Irrigators' Association, (2) San Isidro Irrigators' Association and (3) Katipunan Irrigators' Association.

The primary cooperatives of the covered ARCs were mostly beneficiaries of the PHFs (in the form of multi-purpose building and solar dryer). These were designed to

improve the viability of these cooperatives and capacitate them to undertake agribusiness as well as provide other services that would help increase agricultural productivity. These cooperatives need to be properly organized and/or strengthened to improve the capability to undertake sustainable livelihood activities that would impact the lives of the members. Included in the assessment were five primary cooperatives that were provided support by the ARISP-III, two of which were located in Biliran, namely: (1) Almeria Agrarian Reform Cooperative (AARCO) and (2) Balaquid Agrarian Reform Cooperative (BARC). The remaining three were from Southern Leyte, namely: (1) Katipunan Agrarian Reform Beneficiaries' Cooperative (KARBC) and (2) Hingatungan Agrarian Reform Cooperative (HARC) in Silago as well as (3) San Ricardo Agrarian Reform Beneficiaries' Cooperative (SARABCO) in San Ricardo.

The other ARBOs focused by the efforts of the INSTIDEV component were the WUAs. These were beneficiaries of the PWS development that envisioned to improve access to, and availability of, safe potable water in the ARCs thus minimizing the time spent by women and children in hauling water from the springs and wells. The management of the PWS project had to be entrusted to capable associations, hence the need for capability building. Two out of the five WUAs included in the assessment were in Biliran, namely: (1) Jamorawon Water Services Association (JAWASA) and (3) Balaquid Water Users' Association (BAWUA) in Biliran. Those in Southern Leyte were as follows: (1) Barangay Water and Sanitation Association (BAWASA) and (2) Katipunan Water and Sanitation Association (KAWASA) in Silago as well as (3) Rural Water Supply and Sanitation Association (RUWASA) in San Ricardo.

4.3.2.1 Capability Building Activities Conducted

One of the common strategies in building and developing the capability in management skills of primary cooperative officers and members was to conduct seminars and training-workshops. DAR spearheaded the conduct of the activities in partnership with various concerned government agencies which provided direct assistance to the ARBOs. In the case of the primary cooperatives, DAR partnered with the Provincial Project Management Office (PPMO), Department of Agriculture (DA), Cooperative Development Authority (CDA), and Local Government Units (LGUs) in conducting seminars and training-workshops. The TAPIs also played a significant role in the conduct of the said activities.

In general, the capability building activities for the beneficiary of primary cooperatives were similar across project sites. The seminar on basic cooperative course and pre-membership/membership were the necessary requirements for all the aspiring members of the cooperative. Furthermore, the cooperative management and governance, cooperative standard, rules formulation, parliamentary procedure, and values reorientation were designed to improve the officers' capability to understand their duties and responsibilities as well as the accountability in all decisions made.

Leadership and values-related concerns were also among the topics during the seminars. These were aimed to educate the officers on the importance of effective leadership in the organization, including the right to human relation, intelligible communication skills, and proper motivation of workers. The aforementioned values are needed in order to establish strong ethical behaviors among officers. Most importantly,

these values are an integral part of management, hence, they must be incorporated in all management seminars.

Moreover, selected officers who were assigned in the various committees of their respective cooperatives attended highly specialized trainings such as strategic planning, policy formulation, feasibility study preparation, business planning, financial management (along with simple record keeping and accounting), audit management and internal control. Business planning and feasibility study preparation workshops were important to equip primary cooperatives with the skills needed to access funding for livelihood projects. This is also needed to train them on how to make plans for an enterprise, anticipate problems, prepare solutions as well as teach them to make budgets and forecasts needed in formulating the best strategies that would give better results.

Financial management topics such as record keeping and proper preparation of financial reports were crucial topics that officers need to learn in order to gain good financial stewardship. These topics helped the officers in making important decisions to avoid financial management problems which would cause common conflict within the cooperatives. Moreover, maintaining complete and accurate records of day-to-day transactions and preparing periodic financial reports are important for the cooperatives to meet legal requirements in registration and renewal. Mastery of these topics enabled the organization to assess its financial operations and status.

Table 11 details the title of the seminars/trainings attended by the officers and selected members of the beneficiary agrarian reform cooperatives in Biliran, Leyte. The number of participants listed was incomplete because some trainings do not have data on the number of participants.

In Southern Leyte, the PPMO, TAPI, CDA and LGUs were actively involved in the conduct of the various capability-building activities among the beneficiary of primary cooperatives. Table 12 lists the seminars/trainings attended by the officers and selected members of the ARCOs. It also includes the duration of seminars/trainings, number of participants, and agencies that assisted DAR in the conduct of said activities.

The capability building activities common to all the IAs included pre-membership education seminar, basic leadership development course, system management, financial management, and strategic planning and policy formulation (Table 13). The NIA provided the lecturers for the seminars and trainings of the IAs with DAR facilitating those activities.

On the other hand, the officers and members of the Water Users' Associations also participated in seminars which focused on the management of potable water system projects specifically on leadership and good governance, fund utilization management, basic organizational management, simplified bookkeeping and accounting, and water system management (Table 14).

Among the three types of ARBOs, the WUAs had lesser participation in the INSTIDEV activities due to the transfer of management of WUAs to the barangay councils.

Table 11. Capability building activities conducted for primary cooperatives in Biliran, 2009-2014

Title of Capability Building Activity	Duration (days)	Conducted by
Basic Cooperative Course	2	TAPI /PPMO
Membership Education Seminar	2	DAR/ PPMO
Cooperative Performance Review	2	CDA
Coaching and Mentoring on CDA Reports Preparation	2	DAR/ VICTO
Training on Cooperative Standard	4	DAR&NLDC/ VICTO
Coop Management and Governance	2	DAR/ VICTO
Business Planning	2	DAR/ TAPI
Strategic Development Planning Seminar	3	DAR /PPMO
Coop Management Strategic Development	2	DAR/ VICTO
Basic PSPs Formulation	2	TAPI/ PPMO
Training on Rules Formulation	2	DAR/ VICTO
Policy Formulation Training	2	Coop/ PPMO
Coaching on Officers Functions and Responsibilities	1	DAR/ TAPI
Organizational Development Training	2	DAR/ PPMO
Parliamentary Procedures Seminar	1	TAPI/ DAR
Leadership Skills Training Workshop	1	MDCA
Leadership and Team Building	1	MDCI
Leadership and Values Reorientation	2	DAR/ VICTO
Performance Evaluation and Monitoring Seminar Workshop	2	CDA
Conflict Management Seminar	1	DAR/ NDLC
Values and Spiritual Formation	2	DAR/ PPMO
Records Management for Non-Financial Transactions	2	DAR/ PPMO
Credit Management: Delinquency Control and Collection Management	2	TAPI/ DAR
Basic Accounting for Non-Accountants	2	DAR/ NLDC
Policy Development Course	2	DAR & VICTO
Audit Management Seminar	4	DAR/ NLDC
Advance Bookkeeping and Accounting	2	TAPI/ DAR
Internal Control Management Seminar	3	ARCCESS
Financial Management Seminar	6	TAPI/ DAR
Simplified Bookkeeping	1	TAPI/ DAR
Members' Savings Operations	2	TAPI/ DAR
Entrepreneurial and Business Management Seminar	2	DAR/ NLDC
Training on Orientation on ARCCESS-BDS	1	DAR
Training Orientation on APCP and PBD Lawyering	1	DAR
Training Orientation on Up- Valuing of ARB Products	1	DAR
Training on Rules Formulation	1	DAR & VICTO
Parliamentary Procedure Seminar	2	DAR & NLDC
Organization Meeting	1	TAPI
Total	75	

Table 12. Capability building activities conducted for primary cooperatives in Southern Leyte

Title of Capability Building Activity	Duration (Days)	Conducted by
Simplified Bookkeeping	1	PPMO & TAPI
Values & Spiritual Formation	2	PPMO
Cooperative Management	2	PPMO
Strategic Development Planning Workshop	3	PPMO
Policy Formulation	2	PPMO & TAPI
Team Building	3	PPMO
Root Crops Training	1	DAR
VMGO Formulation	2	DAR
Simplified Bookkeeping & Accounting Training-Workshop	5	LGU & DAR
Leadership Skills Training-Workshop	4	DAR & LGU
Cooperative Development Action Planning	3	DAR
Membership Education Seminar	1	CDA
Team Building Training Workshop	2	DAR
Pre-membership Education Seminar	2	DAR
Total	35	

Table 13. Capability building activities conducted for irrigators' associations in Biliran and Southern Leyte

Capability Building Activity	Duration (days)	Conducted by
Membership Education Seminar	1	NIA
Basic Leadership Development Course	3	NIA
Systems Maintenance Training	2	NIA
Financial Management Seminar	4	NIA
Financial Management Training	2	NIA
Strategic Planning and Policy Formulation	2	NIA
Pre and Post OM Management	1	NIA
Total	15	

Table 14. Capability building activities conducted for water users' associations in Biliran and Southern Leyte

Capability Building Activity	Duration (days)	Conducted by
Records Management	2	VICTO, DAR
Performance Evaluation and Monitoring	1	DAR
PWS System Management	1	DAR
Policy Formulation Training/Workshop	1	DAR
Records Management for Non-Financial Transactions	1	DAR
Total	6	

4.3.2.2 Number of Person-Days Trained

Through the INSTIDEV component of the ARISP-III, an estimated 4,631 person-day training were conducted across provinces (Table 15). These were attended by ARBO officers and members. A considerable number of the participants (44%) of the trainings/seminars were from the primary cooperatives, followed by the beneficiaries of the WUAs (30%). The rest (26%) were officers and members of the IAs.

Table 15. Number of person-days trained per type of ARBO in Biliran and Southern Leyte

Type of ARBO	Number of Persons Trained	Percentage
Primary Cooperative	2,047	44
Irrigators' Association	1,195	26
Water Users' Association	1,389	30
Total	4,631	100

4.3.2.3 Legalization of Identity

Most of the ARBOs across provinces were already organized prior to the implementation of ARISP-III. However, only 29% of these ARBOs have been registered. Others failed to register before ARISP-III due to problems like irregular conduct of meetings, lack of commitment among members, lack of office facilities, lack of transparency, and inadequacy of documents required for registration. With the ARISP-III, the registration of about half of these organizations was facilitated (Table 16). The IAs were registered with the Securities and Exchange Commission (SEC) while the ARCOs were registered with the CDA. On the other hand, the WUAs were mostly registered with the Department of Labor and Employment (DOLE) and SEC.

However, it was found that during the impact evaluation, one primary cooperative in Biliran and two in Southern Leyte were not able to renew registration with the CDA due to failure in providing the required documents. Moreover, three WUAs across provinces (1 in Biliran and 2 in Southern Leyte) were not renewed with SEC but were registered with the municipal LGUs.

Table 16. Status of Agrarian Reform Beneficiaries' Organizations in Biliran and Southern Leyte during the implementation of ARISP-III

Status of ARBOs	Biliran	Southern Leyte	Total	Percent
Registered before ARISP-III	3	2	5	29.4
Registered during ARISP-III	3	3	6	35.3
Previously dissolved, reorganized and registered during ARISP-III	-	2	2	11.8
Organized before ARISP-III	1	-	1	5.9
Organized during ARISP-III	1	2	3	17.6
Total	8	9	17	100.0

4.3.2.4 Written Organizational Documents

Vision, Mission, Goals and Objectives (VMGO) Statements. The crafting, brainstorming and final approval of the vision, mission, goals and objectives is basic to all formal organizations but difficult to do without the help of people who knew the process. Part of strengthening the ARBOs and helping them secure registration from appropriate government agencies was the assistance in the process of crafting VGMO statements. When VMGOs were finally approved by the General Assembly (GA), it must be posted in a highly visible locations within their offices. Most of the ARBOs did not have formal VGMO statements before the ARISP-III. Although a few had already set the directions for their cooperatives which were agreed upon by the officers and members, these were not written and formally communicated. With the assistance from ARISP-III, all the ARBOs across project sites were able to draft, approve, and post their VGMO statements in their respective offices (Table 17). This served as an important guide to the direction that the ARBOs were heading. Moreover, this helped define their operations and served as yardstick for measuring performance. For the WUAs, the issue on the management of the PWS, payment of the service, among others, were also crucial. Like the primary cooperatives and the IAs, the officers of WUAs were also trained and equipped with skills in writing/preparing their VGMO, Constitution and By-Laws, Policies, Systems and Procedures, minutes of meetings and financial records and reports.

Table 17. Status (in percent) of VMGO preparation by ARBOs in Biliran and Southern Leyte *before* and *during* ARISP-III

Status	Biliran (n=8)		Southern Leyte (n=9)		Total (n=17)	
	Before	During	Before	During	Before	During
Informal, unwritten	62.5	-	55.6	-	58.8	-
Finalized and approved by General Assembly	12.5	100.0	11.1	100.0	11.8	100
Not applicable	25.0	-	33.3	-	29.4	-

Organizational Charts, Members' Profile and Minutes of Meetings. After the conduct of capability-building activities, it was expected that the ARBOs would be capable of producing important documents basic in formal organization such as the organizational chart, members' profile and minutes of the Board of Management, Committee and General Assembly Meetings. An organizational chart is very basic to all formal organizations. It shows the authority relationship among the people from top to bottom of the organizational hierarchy. At the same time, it shows the flow of communication that gives life to the organization.

Before ARISP-III, most of the ARBOs across provinces (53%) had only informal and unwritten authority structure. Only very few (12%) had formal organizational charts. With the registration of the ARBOs during the ARISP-III period, organizational charts were prepared, approved and posted in the respective offices of the organizations (Table 18).

Table 18. Status (in percent) of organizational documents produced by ARBOs in Biliran and Southern Leyte *before* and *after* ARISP-III

Organizational Document	Biliran (n=8)		Southern Leyte (n=9)		Total (n=17)	
	Before	After	Before	After	Before	After
Organizational chart						
Informal, unwritten	62.5	-	44.4	-	52.9	-
Formal, approved and posted	12.5	100.0	11.2	100.0	11.8	100
Not applicable*	25.0	-	44.4	-	35.3	-
Members' profile						
List of members only	62.5	25.0	44.4	33.3	52.9	29.4
Written and filed	12.5	75.0	11.2	66.7	11.8	70.6
Not applicable*	25.0	-	44.4	35.3	-	-
Minutes of BOD meetings						
None	-	12.5	-	-	-	5.9
Written but informal	62.5		44.4	25.0	52.9	11.8
Formal minutes	12.5	87.5	11.2	75.0	11.8	82.3
Not applicable*	25.0		44.4		35.3	
Minutes of committee meetings						
None	-	12.5	-	-	-	5.9
Written but informal	62.5	-	44.4	25.0	35.3	11.8
Formal minutes	12.5	87.5	11.2	75.0	35.3	82.3
Not applicable*	25.0	-	44.4	-	35.3	-
Minutes of general assembly meetings						
None	-	12.5	-	22.2	-	17.6
Written but informal	62.5	-	11.0	11.1	35.3	5.9
Formal minutes	12.5	87.5	44.5	66.7	29.4	76.5
Not applicable*	25.0	-	44.5	-	35.3	-

* ARBOs were not yet organized before ARISP-III

Along with the preparation and approval of organizational chart was the improvement in the preparation of members' profile and minutes of meetings during the implementation of ARISP-III. Moreover, before ARISP-III, more than half of the ARBOs (53%) did not keep any profile of the members. What was commonly kept was only a list of members in the possession of the secretary and treasurer. With ARISP-III, the percentage of those that kept members' profile increased to 71%.

Minutes of meetings are important documents that organizations need to keep for various important purposes. More than half (53%) of the ARBOs assessed had kept written but informal minutes while only 12% produced formal minutes of BOD meetings before ARISP-III. On the other hand, more ARBOs kept formal minutes of committee and general assembly (GA) meetings (35% and 29%, respectively) before ARISP-III. After project implementation, written and formal minutes of BOD, committee and GA meetings had become part of the discipline of more than three-fourths (77% to 82%) of the ARBOs. The remaining 18% of the ARBOs were primary cooperatives, registration

of which had not been renewed for an average of three years. They had not been meeting formally for the past years, hence they had no formal minutes of GA meetings.

Policies, Systems and Procedures. Policies, systems and procedures (PSPs) play a strategic role in the decision-making process of an organization and ensure that the organizational resources as well as its day to day activities are geared towards the achievement of its goals and objectives, accomplishment of its mission and attainment of its vision. One of the tangible outputs of the ARISP-III were the written PSPs for the ARBOs. Before project implementation, the ARBOs did not have any written PSPs except for the Balaquid Agrarian Reform Cooperative in Biliran.

All ARBOs were able to produce 48 important documents that served as guide in their operation and management. Majority (71%) of these documents were produced in Southern Leyte. These included 12 strategic plans, nine operations and management manuals and five basic policies on membership, attendance and other concerns. Moreover, PSPs that served as guide in the implementation of business enterprises for primary cooperatives were also written. These included 19 PSPs for business (9 of which were written but informal), two for service and one for agribusiness (Table 19). These PSPs contained various agreements such as sharing schemes, penalties for non-compliance of specific policies, among others.

Table 19. Number of strategic plans, operation and management manuals as well as policies, systems and procedures written *during* ARISP-III in Biliran and Southern Leyte

Document	Biliran	Southern Leyte	Total
Strategic Plan	7	5	12
Operation and Management Manual	1	8	9
Basic Policies and Procedures	2	3	5
PSP for Business	1	18	19
PSP for Agribusiness	1		1
PSP for Service	1	1	2
Total	13	35	48

Operations and Management Manual (OMM) and Basic Organizational Policies (BOP) are common to both IAs and WUAs. To the IAs, these documents contain Water Distribution Plans/Policies (WDPs) including the usage of irrigation water, systems maintenance plan/policy, financial plan including the collection of association service charge, schedule of regular meeting and crop calendars. All these policies are necessary that served as guide for the day-to-day decisions and actions to have equitable use of available water and scheduling of water distribution to reduce conflict among members especially during dry season when the supply of water is reduced. Of all the ARBOs, the IAs were the most systematic and organized.

For the WUAs, these documents were very important basis for their day-to-day management and operation of the PWS entrusted to them. Distribution of water, monthly fee and maintenance, among others, were contained in these documents. Among WUAs, only the JAWASA in Almeria, Biliran and the Hingatungan Water Users' Association in

Silago, Southern Leyte were the most organized despite the fact that the management of the project was transferred to the barangay council.

Financial Reports. Sound financial practices produce financial reports which are important to assess the financial status and performance of an organization. These documents are vital for transparency purposes. Moreover, the annual financial reports are important inputs for internal decision-making purposes such as fund allocation, strategies to pursue, and more importantly in deciding how to improve operations. The ARBOs studied did not have complete cashbooks and did not prepare financial reports regularly before the implementation of ARISP-III. With the knowledge obtained and skills developed from the capability-building activities of ARISP-III, financial reports were prepared, audited and submitted to appropriate coordinating government agencies. The Hingatungan Irrigators' Association and Balaquid Irrigators' Association were consistently keeping records and preparing financial reports. Hence, these IAs became recipients of funding for some government projects implemented after ARISP-III.

Together with the annual financial reports, cashbooks (including cash receipts and cash disbursement books) were prepared by majority of the ARBOs (82%) after ARISP-III (Table 20). However, copies of the financial reports provided by some ARBOs to the impact assessment team were not complete to allow meaningful analysis. Financial documents of some ARBOs were damaged due to several natural calamities that occurred in the project sites within the project implementation and impact assessment periods. Some ARBOs that were inactive in the past few years were also unable to provide the financial reports. Sustainability in using the recommended financial management practices has become a problem to some ARBOs after the ARISP-III.

Table 20. Financial management records and reports (in percent) of ARBOs in Biliran and Southern Leyte *before* and *after* ARISP-III

Organizational Document	Biliran (n=8)		Southern Leyte (n=9)		Total (n=17)	
	Before	After	Before	After	Before	After
Cashbook						
None	-	12.5	-	-	-	5.9
Informal	75.0	-	55.6	22.2	64.7	11.8
Formal	-	87.5	11.1	77.8	5.9	82.3
Not applicable*	25.0	-	33.3	-	29.4	-
Financial report						
None	-	12.5	-	-	-	5.9
Informal	75.0	-	55.6	22.2	64.7	11.8
Formal	-	87.5	11.1	77.8	5.9	82.3
Not applicable*	25.0	-	33.3	-	29.4	-

* ARBOs were not yet organized before ARISP-III

4.3.3 Agriculture and Agribusiness Development

Despite government efforts to increase agricultural productivity, gaps remain in agricultural production technology, postharvest operation and entrepreneurial skills among Filipino farmers. The AAD component of ARISP-III was designed to address these gaps as it envisioned to increase farm productivity and income through the operations of strong cooperatives in the ARCs. The project provided technical assistance and established demonstration farms to develop skills, introduce new technology and expose farmers to alternative methods or approaches in agricultural production, livelihood enterprises, processing and marketing of products. The AAD involved activities and interventions designed to improve or expand the production of crops, livestock and other agricultural resources and promoted agri-based enterprises and livelihood that would result to an increase in value of agricultural products in the ARCs.

The ARISP-III aimed to realize the objective of increasing farm productivity and income by helping primary cooperatives strengthen the members' farming technology through the establishment of demonstration farms and provision of appropriate training, enhancement of livelihood enterprises, capital assistance and marketing improvement. This assistance was designed for the farmers, through their respective organizations, so that they can take control of the production and marketing of their produce.

The assessment was done on the following ARCOs: Almeria Agrarian Reform Cooperative (AARCO) and Balaquid Agrarian Reform Cooperative (BARC) in Biliran Province as well as Katipunan Agrarian Reform Beneficaries' Cooperative (KARBC), Hingatungan Agrarian Reform Cooperative (HARC) and San Ricardo Agrarian Reform Cooperative (SARABCO) in Silago and San Ricardo, Southern Leyte, respectively.

The AAD component was implemented with DAR as the lead agency in partnership with the respective Office of the Municipal Agriculturist (OMA) in the various LGUs across provinces. As the lead agency, DAR spearheaded the planning, project selection, fund sourcing and follow up, conduct and/or facilitate the training and seminar-workshop and took charge of project monitoring and evaluation. The partner LGUs were responsible in providing resource persons during trainings and some farm inputs needed by the farmer-beneficiaries.

For each cooperative, a TAPI was chosen to do the coaching and follow up on the actual implementation of the suggested farm enterprise management practices, aside from conducting some of the needed seminar and training-workshops. In Almeria, Biliran, the ASEMCO was chosen as the TAPI for AARCO while NSU was chosen as TAPI for BARC in Cabucgayan, Biliran. In Southern Leyte, the TAPI chosen for the agrarian reform cooperatives were individuals instead of organizations. Mr. Conceso Ariola served as TAPI for KARBC and HARC in Silago. On the other hand, Mr. Wilson Apole was chosen as TAPI for SARABCO in San Ricardo.

Agriculture and agribusiness enterprise development was the heart of the ARISP-III implementation. The choice of the enterprise venture and its implementation was the product of a series of planning meetings attended by the local barangay officials, the Provincial and Municipal Agriculture Offices, CDA and DAR. The rest of the activities

such as site selection, follow up of fund release, conduct of trainings, project monitoring and evaluation were all coordinated by DAR.

The Department of Agriculture (DA), Department of Trade and Industry (DTI) and the Local Government Units (LGUs) in the barangay, municipal and provincial levels were also actively involved in the whole process. Aside from the TAPIs which provided hands-on coaching to the officers of the cooperatives involved, the MAO and DTI partnered with DAR in the conduct of trainings/seminars.

The strengthening of the primary cooperatives accomplished in the INSTIDEV component of ARISP-III helped a lot in building the organizational management capability of the officers and increased the trust level of the members. As a result, the capability of the primary cooperatives to manage livelihood enterprises has also improved. The following discussions focus on the outputs of the primary cooperatives through the AAD component of the project:

4.3.3.1 Written Organizational Documents

To guide the implementation of the AAD, all agrarian reform cooperatives drafted and implemented policies on profit sharing arrangements, payment of input costs and penalties for non-compliance and others which were contained in their PSPs for business, service and agribusiness. Some of the more general policies formed part of the Constitution and By-Laws drafted and approved by the general assembly of all agrarian reform cooperatives. However, in some cooperatives, these policies were included in their basic organization policies and Operations and Management Manual.

To outline their long-term direction, strategic plans and VMGOs of the cooperatives were also prepared. The strategic plans served as a roadmap to accomplish the mission and to achieve the goals and long-term objectives of the cooperatives (Table 21).

Aside from operations manuals and specific policies prepared, generating accounting records from day-to-day business transactions were needed to prepare financial reports that are basic and very important for the sustainability of the cooperatives. However, most cooperatives have encountered problems in keeping track of their financial management due to some consistency and transparency issues. For the ARCOs assessed across study sites, most of them only had informal financial records and reports before the ARISP-III (Table 22). Records and reports were made available to any interested party upon request. Few years after the implementation of the project, regular and consistent recording of daily transactions, preparation of cashbooks (both cash receipts and cash disbursements) and preparation of financial reports were practiced by the assigned officers with the close coaching and supervision of the TAPI. However, due to the termination of the services of the TAPI, and the turnover of officers, some ARCOs were not able to sustain this very important financial management discipline. Thus, the DAR and other agencies have to work hand in hand in order to provide the needed monitoring and coaching for sustainability purposes.

Table 21. Written business plans/policies of the agrarian reform cooperatives in Biliran and Southern Leyte

Organizational Document	Biliran		Southern Leyte		Total	
	Before	After	Before	After	Before	After
Basic organizational policies	Informal	2	Informal	3	Informal	5
PSPs for business	None	2	None	9	None	11
PSPs for service	None	1	None	1	None	2
PSPs for agribusiness	None	2	None	3	None	5
PSPs – operations and management manual	None	2	None	3	None	5
Strategic development plan	None	2	None	3	None	5

Table 22. Financial management records and reports (in percent) of ARCOs in Biliran and Southern Leyte *before* and *after* ARISP III

Organizational Document	Biliran (n=8)		Southern Leyte (n=9)		Total (n=17)	
	Before	After	Before	After	Before	After
Cashbook						
None		12.5				5.9
Informal	75.0		55.6	22.2	64.7	11.8
Formal		87.5	11.1	77.8	5.9	82.3
Not applicable*	25.0		33.3		29.4	
Financial report						
None		12.5				5.9
Informal	75.0		55.6	22.2	64.7	11.8
Formal		87.5	11.1	77.8	5.9	82.3
Not applicable*	25.0		33.3		29.4	

* ARBOs were not yet organized before ARIS- III

4.3.3.2 Trainings Conducted

One of the main outputs of the AAD was the conduct of various trainings designed to equip the farmer-member beneficiaries with the skills needed to develop the chosen enterprise in their own farms. Aside from this, trainings are also necessary so that farmers can use efficiently the inputs provided in order to improve farm productivity and increase farm income. A total of 11 trainings/seminars for a total of 411 days were conducted in Biliran. Most of these trainings were about the production of specific crops or processing of specific food products. A total of 234 ARCO officers and members participated in said capability-building activities. Table 23 details the title, duration, number of participants, and agency that conducted the seminars and trainings.

Table 23. List of trainings attended by the primary cooperatives in Biliran

Title	Duration (days)	No. of Participants	Conducted by
Entrepreneurial and Business Management Seminar	3	4	DAR, NDLC
Rice Productivity Enhancement cum Season Long Training on Palay Check System	56	52	DAR, LGU-MAO
Vegetable Production Demo Farm cum Hands-on/ Season Long Training	150	57	DAR, LGU-MAO
Village Level Processing Enhancement Training	30	3	DAR
Business Planning Workshop on Palay Trading/ Rice Retailing	3	12	DAR, NSU
Business Planning on Atsara Making	6	3	DAR-BARBD
Skills Training on Native Delicacies Making	1	25	DTI
Coconut- based Diversified Integrated Farming System	4	25	ATI
Training on Organic Agriculture	3	25	ATI
PCIC Orientation	1	3	DAR, MDCI
PALAYAMANAN Training	150	25	DAR, LGU-MAO
Total	411	234	

Meanwhile, there were more varied seminars and training-workshops for the officers and members of the three primary cooperatives in Southern Leyte. However, these were conducted in shorter duration compared to those in Biliran. These consisted of 15 capability-building activities that were conducted for only 33 days and were participated in by a total of 743 ARCO officers and members (Table 24).

4.3.3.3 Agriculture and Agribusiness Enterprises Established

Before ARISP-III implementation, the primary cooperatives in Biliran and Southern Leyte were already engaged in two common livelihood activities: lending and farm input trading (Table 25). Lending was common because of the members' need for cash to sustain family needs while waiting for the harvest of palay. On the other hand, trading of farm inputs was done to assist farmer-members who have no financial capability to purchase the needed farm inputs. Moreover, the BARC in Biliran already engaged in Palay Trading using a grant money amounting to PhP110,000.00 from the PEF. Due to the absence of a storage warehouse, BARC utilized the houses of its members as storage for the palay they traded. Furthermore, two ARCOs in Southern Leyte were engaged in catering and vermiculture in addition to the lending and farm input trading before ARISP-III.

Table 24. List of trainings attended by the primary cooperatives in Southern Leyte

Title	Duration (days)	No. of Participants	Conducted by
Farmers' Field Day	1	10	LGU-DA
Vegetable Production Training Workshop	4	134	Private Partner
Meat Preservation and Marketing	1	42	Self Help
Natural Farming Technology for Sustainable Farming/ Organic Agriculture	2	23	
Fermented Plant Juice a Growth Hormones for Nitrogen, Phosphorus and Potassium Fertilizer	1	77	LGU-DA
Oriental Herbal Nutrient Pesticide	1	89	LGU-DA
Fermented Plant Juice a Growth Hormones for Nitrogen, Phosphorus and Calcium Fertilizer	1	77	LGU-DA
Enhanced Palay Production Training Workshop	13	44	LGU-DA
Orientation Seminar on Enhanced Palay Production	1	30	LGU-DA
Asparagus Production	1	20	Private Partner
Ampalaya Production	1	28	Private Partner
Organic Banana Production Training Workshop	1	53	SC Global and Coco Products
Indigenous Microorganisms	1	27	LGU-DA
Coco-based Pineapple Enhancement Production Training Workshop	1	28	LGU-DA
Intensified and Diversified Training Workshop	1	45	LGU-DA
High Value Vegetable Production	2	25	LGU-DA
Total	33	743	

The AAD component introduced several farming technologies to the farmer-beneficiaries for the development of enterprises. These included production of palay, vegetables, organic vegetables and banana as well as pineapple. It also supported palay trading and vermiculture. This was accomplished by DAR in partnership with the respective MAO in various LGUs across provinces. However, the vegetable enterprise of AARCO as well as the ARISP-III vegetable demo farm and the vermiculture of BARC did not progress because of Typhoon Urduja that damaged the demo farm and farmers' fields. Lending, farm inputs trading and *atsara*-making were the thriving enterprises in the agrarian reform cooperatives studied in Biliran, particularly the BARC.

BARC was successful in allowing its palay trading to grow with the postharvest facilities (PHFs) provided by the ARISP-III. The warehouse was used to store palay and farm inputs while serving as an office and a meeting place of the cooperative members. In addition, the cooperative was doing well in its *Atsara* Processing, lending and farm input loans. Aside from the enterprises which were established during ARISP-III, BARC through the help of DAR and DA, was able to access PhP3M worth of grant from the Philippine Rural Development Project (PRDP) in 2017. The amount was made available in the form of planting materials and equipment plus about PhP1M cash as working

capital. Some members of BARC also participated in vinegar and *moron* processing for possible addition to its existing enterprises. AARCO, on the other hand, was also able to access PRDP funds for goat and boiler production as well as planting materials for vegetable production despite its revoked registration.

Table 25. Agriculture and agribusiness projects of ARCOs *before* and *after* ARISP-III in Biliran and Southern Leyte

Project	*Before* ARISP-III				*After* ARISP-III			
	Biliran	So. Leyte	Total	%	Biliran	So. Leyte	Total	%
Lending/microfinance	2	3	5	38.5	2	3	5	15.6
Palay trading	1		1	7.7	1	1	2	6.3
Farm inputs trading	1	2	3	23.0	2	1	3	9.4
Catering		2	2	15.4		1	1	3.1
Vermiculture		2	1	7.7	2		2	6.3
Meat processing and selling		1	1	7.7				
Loan insurance						1	1	3.1
Organic farm input trading					1	1	2	6.3
Organic banana production						2	2	6.3
Organic vegetable production					1	2	3	9.4
Coconut-pineapple production						1	1	3.1
Goat raising					1		1	3.1
Chicken raising					1		1	3.1
Atsara processing					1		1	3.1
Rental – farm equipment and post-harvest facilities					1	2	3	9.4
Cash remittance						1	1	
Photocopying						2	2	6.3
Purified water trading						1	1	3.1
Total			13	100			32	100

During ARISP-III implementation, production of organic banana, vegetable and pineapple in coconut areas were introduced as additional livelihood enterprises for the agrarian reform cooperatives in Southern Leyte. A total land area of 274,528 sq m was utilized for the different farm enterprises developed through AAD across the three cooperatives involved. Of this total area, 61% was devoted to organic banana production, 7% to vegetable production and 30% to palay. The remaining area was utilized as demonstration farm. For some reasons, only one out of the two KARBC members has been doing well in the organic banana production and has even diversified into hog, chicken and other enterprises. Other members who planted organic banana were not able to harvest due to very small fruits which turned out non-marketable. There were also 5

KARBC members who engaged in the production of pineapple. Out of the five, only one was able to harvest and sell. Other members stopped planting because they were not paid with the planting materials they produced.

In Hingatungan, the HARC was doing well in its agricultural inputs, organic fertilizer and pesticide trading, catering, lending, and loan insurance. SARABCO, in San Ricardo also did well in growing organic banana produced in a communal farm. The organic vegetable production did not last long because the farm was damaged by a strong typhoon.

As of 2019, the KARBC has not resumed operation yet because of its failure to renew registration and mounting collectible accounts. The cooperative has intensified collection of its receivables and planned to resume operation after fixing some management and financial problems. The HARC has engaged in the following enterprises: agricultural input and organic pesticide trading for its members, catering, lending for its members, and providing loan insurance to its members. SARABCO was still into banana production with seven members actively involved in the enterprise. Other enterprises still in operation were the photocopying services and the buy and sell of purified water. The cooperative planned to engage in wine making upon renewal of its CDA registration.

In general, the agriculture and agribusiness projects of the ARCOs across provinces increased after ARISP-III.

4.3.3.4 Demonstration Farms Established

One of the strategies commonly used to illustrate effectiveness and profitability of a farming technology is the establishment of a demo farm. The demo farms were also used to showcase the application of new farm technologies specifically on organic vegetable production. Through the ARISP-III, two demo farms on organic vegetable production were established in Katipunan, Silago in Southern Leyte and one in Upper Iyusan, Almeria in Biliran. Farmer-beneficiaries were brought there during trainings to see how the production practices of organic banana was done. However, strong typhoons like Urduja that badly hit Biliran and other parts of Region VIII severely damaged the area. After the calamities, no rehabilitation had been done on the demo farms.

4.4 Project Outcomes

An in-depth survey was done on randomly selected ARISP-III beneficiaries and non-beneficiaries across provinces to determine project outcomes and impacts. This section presents the characteristics and practices of the sample farmer-respondents based on the survey conducted in the project sites. Data from 378 respondents (228 ARISP-III beneficiaries and 150 non-beneficiaries across the provinces of Biliran and Southern Leyte) are included in the analysis. This section also discusses the outcomes generated by the project.

4.4.1 Characteristics and Practices of the Sample Farmer-Respondents

This section presents findings on some characteristics and practices between ARISP-III beneficiaries and non-beneficiaries. These include socio-economic characteristics, farming characteristics, resource utilization, marketing of palay, membership in organizations, and attendance to trainings.

4.4.1.1 Socio-economic Characteristics of the Sample Farmer-Respondents

Table 26 shows the socio-demographic characteristics of the farmer-respondents in the provinces of Biliran and Southern Leyte. Both the ARISP-III beneficiaries and non-beneficiaries included in the survey were supported by DAR, LGUs and other government agencies.

A considerable number of both the beneficiaries and non-beneficiaries (44%) were relatively old with age from 46 to 60 years old. On average, they were in their mid-fifties (56 years old). Majority of them were males and married. On average, they spent at least seven formal years at school. In 2018, they had five household members which was a little over the national average household size of 4.4 in 2015.

Both beneficiaries and non-beneficiaries had varied sources of annual household income. These can be classified into farm, off-farm and non-farm sources (Table 27). On average, the bulk of the household income of both respondents (71%) was generated from non-farm sources, followed by farm sources (26%). The main non-farm source of income was salaries and wages of household members. This contributed 39% to the household income. This was followed by remittances received from other household members working elsewhere (31%). On the other hand, rice farming provided more than half (54%) of the respondents' farm income. This was followed by coconut farming that contributed about 23% of the respondents' farm income.

On average, the non-beneficiaries generated higher annual household income (PhP161,350) than the beneficiaries (PhP110,581) (Table 27). Similarly, the former had higher annual household expenditures than the latter. About half of the household expenditures (48%) was spent on food items (Table 28).

The beneficiaries and non-beneficiaries generally owned the houses they live in (Table 29). Most of them (83-91%) had the pour-type toilet facility. Moreover, more than half (53-56%) of the farmer-respondents obtained their water supply from water pipes/tanks provided by the government and other groups including the facilities provided by ARISP-III. The findings further showed that at least a quarter of both beneficiaries and non-beneficiaries still obtain their water supply from springs in their respective areas.

Table 26. Socio-demographic characteristics of sample farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Beneficiary (n=228)		Non-Beneficiary (n=150)		All Respondents (n=378)	
	No.	%	No.	%	No.	%
Age						
18 to 30	2	0.9	2	1.3	4	1.1
31 to 45	39	17.1	40	26.7	79	20.9
46 to 60	110	48.2	58	38.7	168	44.4
Above 60	77	33.8	50	33.3	127	33.6
Mean (years)	56		55		56	
Gender						
Male	164	71.9	109	72.7	273	72.2
Female	64	28.1	41	27.3	105	27.8
Educational attainment						
No grade completed	3	1.3			3	0.8
Elementary undergraduate	58	25.4	42	28.0	100	26.5
Elemetary graduate	71	31.1	36	24.0	107	28.3
High school undergraduate	25	11.0	21	14.0	46	12.2
High school graduate	43	18.9	26	17.3	69	18.3
College undergraduate	16	7.0	13	8.7	29	7.7
College graduate	7	3.1	9	6.0	16	4.2
Vocational	4	1.8	3	2.0	7	1.9
Postgraduate	1	0.4				
Mean (years)	7		7		7	
Marital status						
Single	6	2.6	5	3.3	11	2.9
Married	180	78.9	121	80.7	301	79.6
Widowed	24	10.5	15	10.0	39	10.3
Separated/ divorced	3	1.3	2	1.3	5	1.3
Live-in	15	6.6	7	4.7	22	5.8
Household size						
1 to 3	68	29.8	46	30.7	114	30.2
4 to 6	116	50.9	71	47.3	187	49.5
7 to 9	37	16.2	32	21.3	69	18.3
10 to 12	5	2.2	1	0.7	6	1.6
13 to 14	2	0.9			2	0.7
Mean	5		5		5	

Table 27. Average annual household income (in PhP) of sample farmer-respondents in Biliran and Southern Leyte, 2018

Source of Income	Beneficiary (n=228)	Non-Beneficiary (n=150)	All Respondents (n=378)
Farm Income			
Rice production	13,595.78	26,559.71	18,385.23
Vegetable farming	1,515.62	4,690.99	2,583.70
Rootcrops farming	154.79		103.04
Livestock/ poultry raising	4,181.74	6,230.70	4,883.18
Coconut farming	6,941.52	8,946.15	7,677.68
Banana production	170.05	282.27	207.80
Off-farm Income	1,366.87	6,213.16	3,002.84
Non-farm Income			
Salaries and Wages	27,472.22	49,284.34	35,612.92
Sari-sari store/business	13,315.43	22,623.51	16,501.98
Remittances received	29,462.33	26,578.40	28,426.44
Pension, retirement, & other similar benefits	6,222.83	2,895.54	5,096.98
4Ps	3,772.07	4,561.69	4,041.53
Others	2,410.55	2,483.48	2,435.74
Total	110,581.80	161,349.90	128,959.1

Table 28. Average annual household expenses of the farmer-respondents in Biliran and Southern Leyte, Eastern Visayas, 2018

Variable	Beneficiary (n=228)	Non-Beneficiary (n=150)	All Respondents (n=378)
Food	65,439	74,466	69,031
Clothing	1,659	2,241	1,888
Utilities	9,239	10,176	9,611
Water bills	448	2,677	1,332
Repair and maintenance of household facilities	12,992	11,900	12,560
Non-food items (e. g. toiletries, etc.)	7,603	9,009	8,161
Health expenses (medicine, hospital fees)	9,587	5,714	8,056
Transportation	10,208	10,704	10,405
Communication	3,658	2,947	3,376
Recreation (liquors, cigarettes, gambling)	4,305	4,409	4,346
Education	7,596	9,526	8,362
Special occasions (birthdays, Christmas, etc.)	4,692	7,169	5,675
Total	137,426	150,938	142,803

Table 29. Information on dwelling place of sample farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Type of Respondent				All Respondents (n=378)	
	Beneficiary (n=228)		Non-Beneficiary (n=150)			
	n	%	n	%	n	%
Ownership of Dwelling Place						
Owned	213	93.4	140	93.3	353	93.4
Rented	3	1.3	3	2.0	6	1.6
Living with others	3	1.3	5	3.3	8	2.1
Squatter	5	2.2	1	0.7	6	1.6
Caretaker	4	1.8	1	0.7	5	1.3
Toilet Facility						
Flush	34	14.9	12	8.0	46	12.2
Pour	189	82.9	137	91.3	326	86.2
Antipolo type	3	1.3	1	0.7	4	1.1
None	2	0.9	0	0.0	2	0.5
Source of Water Supply						
Private water connection	6	2.6	5	3.3	11	2.9
Water pipe/ tank provided by government and other groups	127	55.7	80	53.3	207	54.8
Refilling station/ store	1	0.4	4	2.7	5	1.3
Spring	88	38.6	38	25.3	126	33.3
Well	6	2.6	23	15.3	29	7.7

4.4.1.2 Farming Characteristics of the Sample Farmer-Respondents

The farmer-respondents across provinces had varied farming experiences (Table 30). Majority of both beneficiaries and non-beneficiaries had been into general farming from 11 to 40 years. Aside from palay, they engaged in vegetable, coconut, banana, and rootcrops production. On average, the beneficiaries had longer farming experience (28 years) than the non-beneficiaries (25 years).

Shortly after engaging in general farming, the farmer-respondents started producing palay. Similarly, the beneficiaries had a bit longer palay farming experience than the non-beneficiaries. On average, the former engaged in palay production four years ahead (27 years) than the latter (23 years).

The farmer-respondents across provinces cultivated about 1.25 ha, about 65% of which were devoted to rice production. On average, the beneficiaries cultivated 0.74 ha while the non-beneficiaries tilled 0.91 ha rice farms (Table 30).

More than half of the beneficiaries (52%) and non-beneficiaries (55%) were share tenants of the land parcels they cultivated and devoted to palay production. Moreover, a large number of the beneficiaries (44%) and a little over one-fifth of the non-beneficiaries (22%) owned said parcels (Table 31).

Table 30. Farming characteristics of sample farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Type of Respondent					
	Beneficiary (n=228)		Non-Beneficiary (n=150)		All Respondents (n=378)	
	No.	%	No.	%	No.	%
General farming experience (years)						
1 to 10	25	11.0	33	22.0	58	15.3
11 to 20	61	26.8	42	28.0	103	27.2
21 to 30	64	28.1	23	15.3	87	23.0
31 to 40	37	16.2	29	19.3	66	17.5
41 to 50	29	12.7	19	12.7	48	12.7
51 to 60	8	3.5	4	2.7	12	3.2
61 to 65	4	1.8			4	1.1
Mean	28		25		27	
Experience in rice farming (years)						
1 to 10	31	13.6	42	28.0	73	19.3
11 to 20	60	26.3	38	25.3	98	25.9
21 to 30	60	26.3	22	14.7	82	21.7
31 to 40	38	16.7	27	18.0	65	17.2
41 to 50	28	12.3	17	11.3	45	11.9
51 to 60	8	3.5	4	2.7	12	3.2
61 to 65	3	1.3			3	0.8
Mean	27		23		26	
Total farm area (mean ha)	1.20		1.32		1.25	
Total area planted to rice (mean ha)	0.74		0.91		0.81	

Table 31. Tenurial status of land parcel devoted to palay production by sample farmer-respondents in Biliran and Southern Leyte, 2018

Tenure Status	Type of Respondent					
	Beneficiary (n=228)		Non-beneficiary (n=148)		All Respondents (n=376)	
	No.	%	No.	%	No.	%
Owner cultivator	101	44.3	29	19.6	130	34.6
Share tenant	118	51.8	81	54.7	199	52.9
Leaseholder	1	0.4	5	3.4	6	1.6
Amortizing owner	4	1.8	26	17.6	30	8.0
Claimant cultivator			3	2.0	3	0.8
Mortgagee	3	1.3	1	0.7	4	1.0
Others	1	0.4	3	2.0	4	1.0

In general, the farmer-respondents across provinces used water from either concrete or earthen canals of irrigation systems in their respective areas. More than two-thirds of the beneficiaries (70%) claimed that they irrigated their rice fields from concrete canals compared to only less than half of the non-beneficiaries (47%). Half of these farmers still obtained irrigation water from earthen canals (Table 32).

The beneficiaries had also better water distribution system compared to the non-beneficiaries especially during dry season. More than half of the beneficiaries (53%) enjoyed continuous water distribution system. On the other hand, more than two-thirds of the non-beneficiaries (68%) still experienced rotational distribution system.

Table 32. Primary source of irrigation and water distribution for rice parcels during dry season of farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Type of Respondent					
	Beneficiary (n=227)		Non-Beneficiary (n=148)		All Respondents (n=375)	
	No.	%	No.	%	No.	%
Primary Source of Irrigation Water						
Concrete canal	158	69.6	70	47.3	228	60.8
Earthen canal	67	29.5	74	50.0	141	37.6
Others	2	0.9			2	0.5
Pond/ Lake (Pipe/ Drip)			4	2.7	4	1.1
Water Distribution System						
Continuous	120	53.3	48	32.4	168	45.0
Rotational	105	46.7	100	67.6	205	55.0

The farmer-respondents across provinces used either certified/registered, hybrid or traditional rice varieties (Table 33). Majority of both beneficiaries and non-beneficiaries (73-79%) utilized certified/registered seeds. However, more beneficiaries (26%) used hybrid rice varieties than the non-beneficiaries (19%).

The farmers had several sources of rice seeds. A considerable proportion of beneficiaries (45%) and more than half of the non-beneficiaries (55%) obtained their seeds from co-farmers by swapping their produce with said seeds. Others bought seeds from DA-LGU and private sellers as well as used seeds they saved from their previous harvest (Table 33).

All the farmers across provinces engaged in transplanting of rice seedlings. Nobody employed direct seeding.

Table 33. Variety and source of rice seeds used by sample farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Type of Respondent					
	Beneficiary (n=228)		Non-Beneficiary (n=150)		All Respondents (n=378)	
	n	%	n	%	n	%
Variety of Rice Seed Used						
Certified/ registered	166	72.8	119	79.3	285	75.4
Hybrid	60	26.3	28	18.7	88	23.3
Traditional	2	0.9	3	2.0	5	1.3
Source of rice seeds						
Swapping with other farmers	102	44.7	82	54.7	184	48.7
Purchased from DA-LGU	59	25.9	47	31.3	106	28.0
Saved from own harvest	33	14.5	9	6.0	42	11.1
Purchased from private seller	15	6.6	10	6.7	25	6.6
Free from DA-LGU	19	8.3	2	1.3	21	5.6

4.4.1.3 Resource Utilization of the Sample Farmer-Respondents

Production of palay entails utilization of various resources. These include material inputs, man labor, animal labor, and machine use. The material inputs used by farmers across provinces included seeds, fertilizer (in the form of nitrogen, phosphorus and potassium), pest control inputs like insecticide, herbicide and molluscicide. Man-labor was classified as hired and family labor.

The beneficiaries and non-beneficiaries had varying levels of input utilization (Table 34). The beneficiaries employed significantly higher amounts of nitrogen, phosphorus and potassium fertilizers as well as molluscicides than the non-beneficiaries. On the contrary, the non-beneficiaries utilized significantly higher amounts of family and animal labor. Meanwhile, the amount of seeds, herbicides, insecticides, hired labor, and machine use did not significantly differ between beneficiaries and non-beneficiaries.

4.4.1.4 Marketing of Palay

Palay produced by farmer-respondents across provinces was either consumed or sold. Majority of both beneficiaries and non-beneficiaries (63-65%) sold their palay (Table 35). They had several market outlets for palay. About a third of the beneficiaries and a little over one-third of the non-beneficiaries (35%) sold their palay to traders. Some beneficiaries (31%) also sold their palay to their neighbors or relatives while more than

one-fifth of the non-beneficiaries (21%) sold their palay to the National Food Authority (NFA). Furthermore, unlike non-beneficiaries, about a tenth of the beneficiaries (9%) sold their product to the cooperative.

Table 34. Resource use per hectare in palay production of sample farmer-respondents in Biliran and Southern Leyte, 2018

Resource	Type of Beneficiary		Difference
	Beneficiary	Non-Beneficiary	
Seeds (kg)	42.53	40.66	1.87
Nitrogen (kg)	95.77	72.24	23.53***
Phosphorus (kg)	42.72	25.38	17.34***
Potassium (kg)	25.90	13.24	12.66***
Herbicides (mL)	527.49	291.09	236.40
Molluscicides (mL)	5.59	0.33	5.26***
Insecticides (mL)	678.02	744.85	-66.83
Hired labor (man-day)	26.68	31.68	-5.01
Family labor (man-day)	8.71	11.74	-3.02***
Animal labor (man-animal day)	4.48	5.33	-0.85***
Machine use (man-day)	0.95	1.66	-0.71^{ns}

****Significant at* $\alpha = 0.01$
***Significant at* $\alpha = 0.05$
**Significant at* $\alpha = 0.1$

The farmer-respondents had several modes of marketing their palay (Table 35). About half of the beneficiaries (48%) delivered their product to the buyers while almost a similar percentage of non-beneficiaries (47%) allowed their buyers to pick up their palay on the road side or a designated pick up point. Other buyers picked up the product from the farm.

4.4.1.5 Membership in Organizations and Attendance to Trainings

All the beneficiaries and 97% of non-beneficiaries across provinces were members of farming-related organizations. Likewise, they were members of IAs (Table 36). However, a smaller number of the farmer-respondents were members of ARCOs and WUAs. Only over a third of the beneficiaries (38%) and over a fifth of the non-beneficiaries (23%) interviewed were members of cooperatives. On the other hand, only 13% of the beneficiaries and four percent of the non-beneficiaries were members of WUAs.

Aside from IAs and ARCOs, some of the farmer-respondents were also members of socio-civic organizations like women's association, organization for senior citizens/elderly, religious and political organizations, among others.

Table 35. Marketing of palay by sample farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Type of Respondent				All Responents (n=378)	
	Beneficiary (n=228)		Non-Beneficiary (n=150)			
	No.	%	No.	%	No.	%
Marketing of Palay						
Sold	144	63.2	98	65.3	242	64.0
Did not sell	84	36.8	52	34.7	136	36.0
Primary market outlet	(n=144)		(n=98)		(n=242)	
Trader	47	32.6	34	34.7	81	33.5
Neighbor/ relative	44	30.6	16	16.3	60	24.8
Regular buyer	24	16.7	10	10.2	34	14.0
Cooperative	13	9.0			13	5.4
Input dealer/ store	12	8.3	11	11.2	23	9.5
NFA	2	1.4	21	21.4	23	9.5
Others*	2	1.4	6	6.1	8	3.3
Mode of marketing						
Delivered to the buyer	69	47.9	22	22.4	91	37.6
Picked up from farm	49	34.0	27	27.6	76	31.4
Picked up on roadside	20	13.9	46	46.9	66	27.3
Display on store	2	1.4	3	3.1	5	2.1
Picked up from house	4	2.8			4	1.7

** IA, tractor owner, rice miller, own store*

Table 36. Membership in organizations by sample farmer-respondents in Biliran and SouthernLeyte, 2018

Variable	Type of Respondent					
	Beneficiary (n=228)		Non-Beneficiary (n=150)		All Respondents (n=378)	
	No.	%	No.	%	No.	%
Membership in IA						
Member	228	100.0	146	97.3	374	98.1
Not member			4	2.7	4	1.1
Membership in cooperative						
Member	86	37.7	34	22.7	120	31.7
Not member	142	62.3	116	77.3	258	68.3
Membership in water users' association						
Member	29	12.7	6	4.0	35	9.3
Not member	199	87.3	144	96.0	343	90.7

Table 37 shows the involvement of the farmer-respondents in their respective IAs and ARCOs. They were either officers or members of the said organizations. Majority of both beneficiaries and non-beneficiaries were active members of IAs (68-78%) and cooperatives (76-77%). Only few were inactive members.

Table 37. Involvement of sample farmer-respondents in their respective ARBOs in Biliran and Southern Leyte, 2018

Involvement	Type of Respondent					
	Beneficiary		Non-Beneficiary		All Respondents	
	No.	%	No.	%	No.	%
Irrigators' Association	(n=228)		(n=146)		(n=374)	
Officer	41	18.0	23	15.8	64	17.1
Active member	154	67.5	114	78.1	268	71.7
Inactive member	33	14.5	9	6.2	42	11.2
Cooperative	(n=86)		(n=34)		(n=120)	
Officer	10	11.6	8	23.5	18	15.0
Active member	65	75.6	26	76.5	91	75.8
Inactive member	11	12.8	-	-	11	9.2

Close to half of the beneficiaries (49%) while only 43% of the non-beneficiaries were able to attend trainings (Table 38). This implies the need to extend the client reach for activities intended to build the capability of palay producers across provinces.

The trainings attended by the farmer-respondents included technology support relating to the Palay Check System, rice productivity enhancement demo project cum season-long training, vegetable production season-long training, organic agriculture/organic banana production, coconut-based diversified integrated farming, basic cooperatives management, and management of the IAs and WUAs. Aside from ARISP-III, these trainings were facilitated by the IAs, government agencies like NIA, LGUs and NGOs.

Table 38. Attendance to farming-related trainings by sample farmer-respondents in Biliran and Southern Leyte, 2018

Variable	Type of Respondent				All Respondents (n=378)	
	Beneficiary (n=228)		Non-Beneficiary (n=150)			
	No.	%	No.	%	No.	%
Attendance to training						
Attended	111	48.68	65	43.33	176	46.56
Did not attend	117	51.32	85	56.67	202	53.44
Number of trainings attended (mean)	2.52		1.78		2.25	

The various components of ARISP-III resulted to several favorable changes among individual beneficiaries, officers and members as well as management of the ARBOs. The irrigation projects under INFRADEV brought changes in irrigation and cropping intensities as well as in the area cultivated by the sample beneficiaries. On the other hand, the FMR resulted to changes in travel time, mobility and ease of transporting farm products while the PWS resulted to better access to safe water. Meanwhile, the

changes from availment of post-harvest facilities included trading volume of palay, quality of grains and storage losses.

For its part, the INSTIDEV component resulted to changes in the following: membership in ARBOs; management knowledge, attitude and practices; management practices of the ARBOs; productivity and efficiency as well as awards and recognition. The AAD component, on the other hand, brought about the following changes: members' involvement in cooperative activities, personal entrepreneurial competencies, and management practices of the cooperative.

4.4.2 Outcomes of Infrastructure Development

4.4.2.1 Outcomes of the Communal Irrigation System/Project

The communal irrigation systems/projects brought changes on irrigation and cropping intensities as well as area cultivated for palay production. Efforts to rehabilitate the CIS/CIP improved the irrigation intensity across project sites. Tables 39 and 40 show that there was a significant increase in irrigation intensity in both wet and dry seasons across project sites. Water is not limited during wet season and the project further increased irrigation intensity from 93% to 99%. On the other hand, availability of water during dry season is critical and the project was able to significantly increase irrigation intensity from 85% to 97% across sites. This implies that the project has increased the actual irrigated areas across sites in relation to the service areas of the irrigations systems.

Table 39. Irrigation intensity during wet season *before* and *after* ARISP-III in Biliran and Southern Leyte

Project Site	Before ARISP-III	After ARISP-III	Difference
Biliran	90.54	98.57	8.03*
Southern Leyte	94.65	100.00	5.35*
Both	92.73	99.33	6.6***

****Significant at* $\alpha = 0.01$
**Significant at* $\alpha = 0.10$

Table 40. Irrigation intensity during dry season *before* and *after* ARISP-III in Biliran and Southern Leyte

Project Site	*Before* ARISP-III	*After* ARISP-III	Difference
Biliran	80.78	96.19	15.41***
Southern Leyte	88.09	97.30	9.21**
Both	84.68	96.78	12.10***

****Significant at* $\alpha = 0.01$
***Significant at* $\alpha = 0.05$

The increased irrigation intensity in both cropping seasons also improved the cropping intensity across project sites. As shown in Table 41, cropping intensity significantly increased from 177% to 196%. This implies that the total actual irrigated areas during wet and dry seasons significantly increased in relation to the service areas

of the irrigation systems. These results were supported by the increased areas devoted to palay production across project sites per cropping season and during dry season (Tables 42 and 43, respectively).

Table 41. Cropping intensity *before* and *after* ARISP-III in Biliran and Southern Leyte

Project Site	*Before* ARISP-III	*After* ARISP-III	Difference
Biliran	171.32	194.76	23.44***
Southern Leyte	182.74	197.30	14.56**
Both	177.41	196.12	18.71***

Note: ***Significant at $\alpha = 0.01$
**Significant at $\alpha = 0.05$

Table 42. Area (mean hectare) of sample beneficiaries per cropping season *before* and *after* ARISP-III in Biliran and Southern Leyte

Project Site	*Before* ARISP-III	*After* ARISP-III	Difference
Biliran	0.559	0.654	0.092**
Southern Leyte	0.404	0.446	0.042*
Both	0.472	0.536	0.064***

Note: ***Significant at $\alpha = 0.01$
**Significant at $\alpha = 0.05$
*Significant at $\alpha = 0.10$

Table 43. Area (mean hectare) of sample beneficiaries during dry season *before* and *after* ARISP-III in Biliran and Southern Leyte

Project Site	*Before* ARISP-III	*After* ARISP-III	Difference
Biliran	0.553	0.651	0.098*
Southern Leyte	0.404	0.446	0.042ns
Both	0.469	0.536	0.067**

Note: **Significant at $\alpha = 0.05$
*Significant at $\alpha = 0.10$
ns Not significant

These results have affirmed the claim of project implementers and beneficiaries during FGDs that the actual irrigated areas in both cropping seasons across projects sites increased. The increase in irrigation and cropping intensities were higher in Biliran than in Southern Leyte. In fact, some sample farmers in Biliran narrated that the most significant change that they have experienced with ARISP-III was the improved irrigation system that enabled them to plant rice continously. Accordingly, they can now plant twice a year, unlike before when they could only plant during wet season.

4.4.2.2 Outcomes of the Farm-to-Market Road

Similar to communal irrigation systems/projects, the construction of FMR brought about favorable changes to the benefiaries across project sites. A total of 150 out of the 228 sample beneficiaries included in the survey claimed to have benefitted from the ARISP-III FMR projects across provinces. These changes included reduction in

transportation cost and travel time, increased mobility, employment during construction, ease in transporting goods, sense of security, and support to tourism (Table 44).

The immediate change observed by the beneficiaries with the completion of the FMR project was the ease of access for travel. The most commonly cited change by the beneficiaries (70% to 74%) across provinces was the reduction in travel time (Table 44). With paved road, transportation has improved. In particular, the average travel time between the farmers' home to their nearest market reduced significantly. Before the road was constructed, it would take them around one hour to reach their nearest market but with the paved road, travel time was reduced to approximately 15 minutes only. This reduction in travel time was facilitated by the availability of motorized vehicles when the road was paved.

Table 45 shows the comparison of travel time across sites. Results show that there is a significant reduction in travel time. On average, the reduction in travel time is around 42 minutes. For Biliran, the reduction in travel time is more than half an hour (34 minutes) while for Southern Leyte the reduction in travel with the paved road is almost an hour (52 minutes).

These findings were supported by the claims of the beneficiaries during FGDs and their stories of significant change. The storytellers claimed that since they already have a cemented road, it became faster for them to go to the town proper, transport their farm produce and farm tools, or to go from one place to another. Some also said that they can go to their farms at a shorter time because it is easier to travel through a cemented road than through a foot path which easily becomes muddy when there is rain. People can use motorized vehicles for transportation now. Figure 6 shows the change in travel time *before* and *after* the road was paved.

Aside from the reduction in travel time, there was also an increased in mobility. This was revealed by more than half of those who have benefited from the FMR in Biliran (52%) and about a fourth in Southern Leyte (24%) (Table 44). This implied that the frequency of travel has also increased. On average, the farmers currently travel 4 or 5 times per week. This was a huge increase compared to just once or twice travelling per week *before* the construction of FMR across provinces (Figure 7).

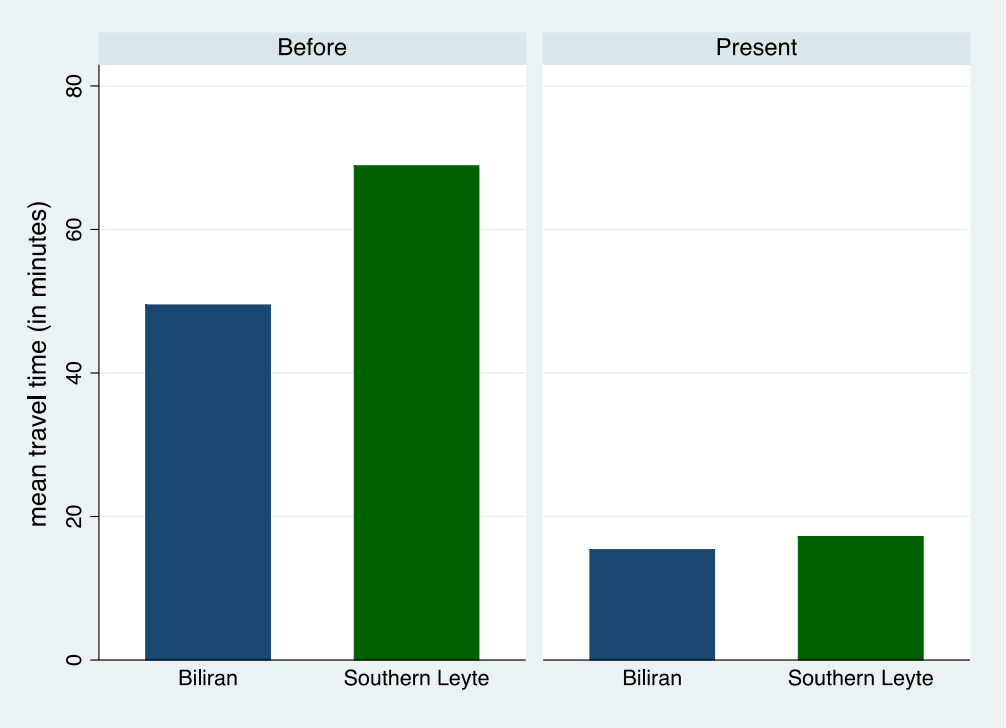


Figure 6. Average travel time *before* and *after* the road was paved in Biliran and Southern Leyte

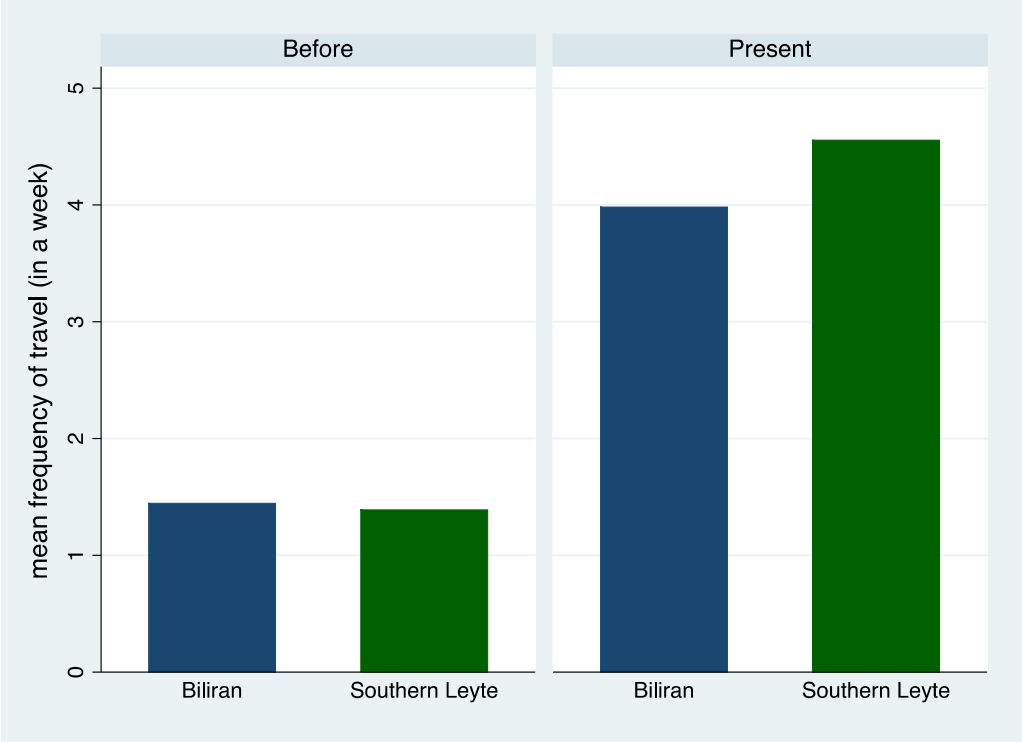


Figure 7. Change in frequency of travel per week in Biliran and Southern Leyte

Table 44. Reported benefits of the farm-to-market road projects in Biliran and Southern Leyte

Reported Benefit	Biliran			Southern Leyte		
	No. of Respondents Citing the Benefit	Percent of Respondents Citing the Benefit	Total No. of Respondents with Valid Responses	No. of Respondents Citing the Benefit	Percent of Respondents Citing the Benefit	Total No. of Respondents with Valid Responses
Reduced transportation cost	3	2.9	105	3	3.7	81
Reduced travel time	77	74.0	104	57	70.4	81
Increased mobility	54	51.9	104	19	23.5	81
Employment during construction	13	13.1	99	18	23.1	78
Ease in transporting goods	53	50.5	105	34	41.5	82
Sense of security	28	27.2	103	19	23.5	81
Support to tourism	5	4.8	105			

Table 45. Comparison of travel time *before* and *after* road construction in Biliran and Southern Leyte

Travel Time	Overall (in minutes)	Biliran (in minutes)	Southern Leyte (in minutes)
Before	57.90	49.49	68.86
Present	16.17	15.39	17.20
Difference (t-test)	41.72***	34.10***	51.66***

Note: *** Significant at 1% level

Aside from reduction in travel time and increased mobility, the construction of FMR has also eased the burden of transporting goods among beneficiaries. More than half of those benefited in Biliran (51%) and a considerable number in Southern Leyte (42%) claimed that the FMR projects made it possible to transport goods more conveniently (Table 44). These conformed to the findings cited during the FGDs and the stories of change provided by the beneficiaries. The storytellers in both provinces said that the cemented road has helped them because it is not that difficult anymore for them to transport their produce. Before, it was so burdensome for them to transport their produce because they did it through manual hauling wherein thay have to travel on foot, and the road was muddy and difficult especially during rainy season. Aside from reducing their drudgery in transporting goods, it was now easier for farmers to go from their place to another because of the cemented road and availability of more motorized vehicles especially *habal-habal*.

Other benefits from the construction of FMR projects included employment during the construction period, sense of security, and support to tourism. Those who worked during the construction of the infrastructure were able to generate income. Others revealed that they now feel more secure even if they travel during night time because of the availability of *habal-habal* that makes travel time faster. Besides, the paved roads were now free from snakes and other poisonous insects. In addition, concrete roads prevented people from stumbling, making travel more convenient. Some of those from Biliran mentioned that the FMR supported local tourism. Better road encouraged the visit of more tourists to the Kasabangan Falls as the FMR ends to the point where the trail going to the falls begins. Only very few beneficiaries claimed to have experienced reduction in transportation cost. But two stories of change (one from each province) support this claim. These stories were generally telling that since the road was already cemented, fare in going from one place to another has become cheaper. Moreover, one storyteller said that some buyers of their produce are the ones who would go to their places, so they need not spend for the fare in transporting their produce.

4.4.2.3 Outcomes of the Potable Water System

Table 46 shows the characteristics/features of the water supply across project sites based on the information provided by the beneficiaries included in the survey. It is observed that availability of piped water supply at present was mentioned by 82 out of 224 respondent-beneficiaries (37%), which is an improvement over the 11% before construction of the PWS projects under ARISP-III.

Three-fourths of the beneficiaries perceived that they had access to safe water before the construction of PWS. Moreover, about 86% reported that they did not experience water-borne diseases. Access to safe water only slightly improved (from 75% to 86%), but further observation would reveal that there was much improvement, mainly due to the reduced dependence on spring water (tubod) and water wells, which accounted for 47% and 31%, respectively before ARISP-III. At present, only about 5% of the respondent-beneficiaries mentioned having spring water or well water as source of safe water.

Table 46. Reported characteristics/ features of the water supply before and after the construction of the potable water system under ARISP-III in Biliran and Southern Leyte

Characteristic of the Water Supply	No. of Respondents Citing the Characteristic		Percent of Respondents Citing The Characteristic		Total No. of Respondents with Valid Responses	
	Before	Present	Before	Present	Before	Present
Availability of piped water supply	20	82	10.5	36.6	191	224
Access to safe water	67	77	75.3	85.6	89	90
Springwater (tubod) as source	38	4	46.9	4.9	81	81
Well water (tabay) as source	25	1	30.9	1.2	81	81
ARISP-III PWS	2	65	2.5	80.2	81	81
No family member had water-borne disease	57	58	86.4	86.6	66	67
Sufficiency of water supply	69	64	86.3	80.0	80	80
Low water pressure of ARISP-III PWS	-	19	-	25.0	-	76

The ARISP-III PWS was mentioned by about 80% of the respondent-beneficiaries as source of safe water. This is confirmed by the results of microbial analysis of water samples obtained from the PWS constructed under ARISP-III, except for the PWS in Katipunan (Table 47). The analysis was done at the College of Veterinary Medicine of VSU employing the Most Probable Number (MPN) method. It estimated the concentration of viable microorganisms in a sample to test the quality of water (to ensure whether the water is safe or not in terms of bacteria present in it. Results showed that only the sample from Katipunan PWS was positive for *Escherichia coli*, hence not safe for drinking.

Table 47. Microbial analysis of water samples from the potable water system projects constructed by ARISP-III in Biliran and Southern Leyte

Source of Water Sample	MPN/mL	Normal Value
Balaquid PWS	4	100
Jamorawon PWS	3	100
Katipunan PWS	1,100	100
Hingatungan PWS	4	100
San Ricardo PWS	<3	100

The beneficiaries in Katipunan revealed during the validation meeting that they actually stopped drinking water from said source because they suspected that it is not potable. Currently, water from said PWS was used by the nearby school in watering plants and cleaning comfort rooms. Meanwhile, the residents of Barangay Katipunan availed of potable water supply from the old water system and from the new water source provided by Kalahi-CIDSS.

As mentioned earlier, availability of the PWS has reduced the dependence of beneficiaries from spring and well as source of drinking water. This also means reduction in travel time to fetch water from these sources. Table 48 shows the time spent in fetching water *before* and *after* construction of the PWS. It is observed that similar to FMR, the ARISP-III significantly reduced travel time in fetching water through the provision of PWS. On average, the beneficiaries across project sites saved about 11 to 12 minutes per fetching trip.

Table 48. Comparison of travel time to fetch water *before* and *after* provision of potable water system in Biliran and Southern Leyte

Travel Time	Overall (in minutes)	Biliran (in minutes)	Southern Leyte (in minutes)
Before	14.0	12.2	14.2
Present	3.2	0.2	3.5
Difference (t-test)	10.8***	12.0*	10.8***

Note: *** Significant at 1% level
* Significant at 10% level

Except for the PWS in Cabucgayan, Biliran and in Katipunan, Silago, Southern Leyte, the number of households served by the piped water system increased with the construction of the PWS under ARISP-III. The PWS in San Ricardo, Southern Leyte provided service to 52 more households from two barangays or an increase of household users by 34%. This was followed by the PWS in Almeria, Biliran that provided service to 98 additional households or an increase of household users by 31% (Table 49). Due to Typhoon Urduja in December 2017, the PWS in Brgy. Balaquid, Cabucgayan, Biliran was damaged and has not been rehabilitated yet. Similar to the residents from Brgy. Katipunan, Silago, Southern Leyte, those from Brgy. Balaquid availed of the service of PWS provided by Kalahi CIDSS.

Some respondent-beneficiaries revealed problems about the PWS constructed under ARISP-III (Table 50). The more common problems cited by the respondent-beneficiaries across project sites were insufficency of water supply (35%) and low water pressure (25%). Insufficient water supply and low water pressure during "peak–use" periods and during the dry season could be attributed, in general, to the growing number of connections to the households, even if the design of the system was only for provision of water at tap stands. In one particular site, the reservoir was moved at a lower elevation to avoid excessive pressure at the tap stands, but as more households were connected, the pressure was not

enough and eventually, the reservoir was bypassed and the main pipes were connected directly to the intake structure.

Table 49. Number of households served by piped water system before and after construction of the potable water system under ARISP-III in Biliran and Southern Leyte

Location of PWS	Number of Household Served		% Change
	Before	Now	
Brgy. Jamorawon, Almeria, Biliran	314	412	31
Brgy. Hingatungan, Silago, Southern Leyte	452	510	13
Brgy. Looc and Brgy. Kinachawa, San Ricardo, Southern Leyte	152	204	34

Table 50. Reported problems in the potable water system projects constructed under ARISP-III in Biliran and Southern Leyte

Problem	No. of Respondents Citing the Problem	Percent of Respondents Citing the Problem	Total No. of Respondents with Valid Responses
Insufficient water supply	25	35.2	71
Low water pressure	19	25.0	76
Collection of water user's fees	13	18.1	72
Mismanagement by the association officials	15	21.4	70

Other problems on the PWS were related to the collection of water users' fees and on the management of the WUAs. Some respondents claimed that the water users' fees were excessive, the increase was too much (more than twice the old rate), and collectors got angry with the consumers if they cannot pay during the collection period. On the other hand, poor management practices mentioned include delayed action on repair and maintenance of the system, association officials who were not alert or insensitive to complaints and who insisted that what they want should be followed. Some beneficiaries alleged that a possible cause for the leaking/busted pipes was the use of substandard construction materials.

4.4.2.4 Outcomes of the Postharvest Facilities

ARISP-III provided PHFs in the form of storage warehouse and solar dryer to three primary cooperatives as follows: (1) BARC, (2) KARBC and (3) HARC. The warehouse storage facilities were mainly used by the cooperatives and not by individual members. Among cooperatives, only BARC utilized the warehouse for its palay trading business. KARC was not engaged in palay trading hence the warehouse was utilized in storing farm

implements. For its part, HARC is engaged in palay trading. However, it did not utilize the warehouse for the purpose due to its remote location. Similar to KARC, the warehouse is utilized to store farm inputs and implements.

Only a few of the respondent-beneficiaries (20 out of 228) included in the survey were able to use the solar dryers provided by ARISP-III. The respondents interviewed in Almeria and some in Cabucgayan, Biliran were not recipients of the PHFs. Other easons for the low utilization rate included defective pavement of the solar dryer (with cracks and uneven surface that resulted from poor construction) and unequal priority among users. It was mentioned during the FGDs that management gave undue priority to users in commercial quantities over the small-quantity users even if the latter were members of the association.

As shown in Table 51, the most common method of drying palay before the availment of solar dryer was drying at the road side. This was reportedly practiced by two-thirds of the respondent-beneficiaries. Others dried their palay at the village plaza or at their respective lawns.

Table 51. Methods of drying *before* and *after* availment of solar dryer under ARISP-III in Biliran and Southern Leyte

Method	Before (n=20)		Present (n=20)	
	No.	%	No.	%
Drying at the road side	14	70.0		
Drying using the dryer provided by ARISP-III			20	100.0
Drying at the village plaza	4	20.0		
Drying at lawn (*nataran*)/ grassland (*kasagbutan*)	2	10.0		

Table 52 summarizes the quality of the dried palay *before* and *after* utilization of the solar dryer provided by ARISP-III. Thirty (30) percent of the respondents reported broken grains and only 55% reported that the dried palay were of acceptable quality before availment of the service of the solar dryer. On the other hand, the provision of the solar drying pavement by ARISP-III resulted to acceptable grains quality as claimed by more respondents (85%). Nobody even mentioned about broken grains, indicating an overall improvement in the quality of the dried palay.

Table 52. Reported quality of dried palay among ARISP-III beneficiaries in Biliran and Southern Leyte

Quality	Before (n=20)		After (n=20)	
	No.	%	No.	%
Contain broken grains	6	30.0		
Good acceptable quality	11	55.0	17	85.0
Very dry			2	10.0
Contain small stones	2	10.0		
Better quality (than before)			1	5.0

The different palay drying statistics *before* and *after* availment of the service of the solar dryer are summarized in Tables 53 and 54. As shown, there was an increase in the mean quantity of dried palay and a decrease in drying period. However, differences in values were not statistically significant. The most favorable outcome from the utilization of the solar dryer is highly significant reduction in drying losses (0.7 % and 0.1% in Biliran and Southern Leyte, respectively). However, the use of solar dryer in Southern Leyte significantly increased drying cost by PhP0.80 per sack of palay.

Table 53. Palay drying statistics among ARISP-III beneficiaries in Biliran

Variable	Before (n=7)	After (n=7)	Difference
Quantity dried (sacks)	17.4	36.8	19.4^{ns}
Drying period (days)	2.6	3.1	0.5^{ns}
Drying cost (PhP/sack)	5.8	7.0	1.2^{ns}
Drying losses (%)	1.2	0.5	$(0.7)^{**}$

Note: ** Significant based on the t-test at 5% level of significance
ns Not significant based on the t-test at 5% level of significance

Table 54. Palay drying statistics among ARISP-III beneficiaries in Southern Leyte

Variable	Before (n=13)	After (n=13)	Difference
Quantity dried (sacks)	10.0	16.9	6.9^{ns}
Drying period (days)	2.2	1.6	0.6^{ns}
Drying cost (PhP/sack)	0.2	1.0	0.8^{***}
Drying losses (%)	0.3	0.2	$(0.10)^{***}$

Note: *** Significant based on the t-test at 1% level of significance
ns Not significant based on the t-test at 5% level of significance

4.4.3 Outcomes of Institutional Development

The INSTIDEV component likewise generated several favorable outcomes among ARBOs. These are: increased membership, change in management knowledge, attitude and practices, improvement in management practices, as well as improved productivity and efficiency of the operations of ARBOs.

4.4.3.1 Increased Membership

With ARISP-III, the existence of the ARBOs became legal. The primary cooperatives were registered with CDA while the others were registered with either SEC or DOLE, having been able to meet all the legal requirements to operate. With the direction as defined by the VMGOs, the management of the ARBOs became more effective and efficient. One of the most significant outcomes was the general increase in the membership across ARBOs.

With all the strengthening and capability building experiences, the increase in ARBO membership was computed at 33%, with the primary cooperatives registering the highest increase of 106% followed by the WUAs of 20% (Table 55). Membership of the IAs increased only by 5% because of migration of some farmers and additional irrigation system established specifically in Almeria that reduced the number of members of the PulJamTam Irrigators' Association.

The increase in the membership of the WUAs was attributed to the expansion in the coverage of some association like that of the JAWASA. However, as of the impact assessment period, the Balaquid Water Users' Association in Biliran was no longer operational and their supply of water has reduced significantly as affected by earthquake and other natural calamities. On the other hand, despite being not potable, the source of water for the Katipunan Water Users' Association has been used for other purposes aside from drinking.

Table 55. Membership in ARBOs *before* and *after* implementation of ARISP-III in Biliran and Southern Leyte

Type of Organization	Biliran		Southern Leyte		Total		Change	
	Before	After	Before	After	Before	After	No.	%
Primary Cooperatives	168	245	194	500	362	745	383	106
Irrigators' Association	167	151	209	243	376	394	18	5
Water Users' Association	1,328	1,721	736	866	2,064	2,587	523	20
Total	1,663	2,117	1,139	1,609	2,802	3,726	924	33

4.4.3.2 Change in Management Knowledge, Attitude and Practices

The management of any organization is reflected in its four functions namely: planning, organizing, leading and controlling. Most failure of people's organizations are oftentimes attributed to the lack of knowledge on these functions, lack of appreciation to introduced management practices and the consequent inability to apply knowledge into actual practice. This part of the impact study attempted to see how the INSTIDEV

component of the ARISP-III impacted the ARBOs in terms of improvement in management knowledge, attitude and practices.

Before the ARISP-III, knowledge of the primary cooperative officers on planning, organizing, leading and controlling functions ranged from very low to low. Their limited management knowledge was a result of their attendance to previous seminars and trainings which were usually done only within a day or two. This very short duration of trainings/seminars is not a guarantee of an effective knowledge transfer. Despite the limited knowledge, the officers agreed that management practices of planning, leading, organizing and controlling are important to the success of an organization. However, only very few of the practices shared to them were actually practiced because it was difficult for them to really internalize new practices introduced only once or twice and to apply them correctly by their own. The usual response of organization officers was to apply them immediately after the training or seminar, but they tended to revert to the old practice later when they found the practice difficult and time-consuming.

The seminars and trainings conducted during the implementation of ARISP-III improved the management knowledge of the officers as well their attitude towards the management practices introduced to them. As a result, their management practices also became consistent. That is why the ARBOs were able to prepare the necessary documents required like the operations and management manual, Constitution and By-Laws, VMGOs and other organization documents. The trust level of the members to the officers also improved with better leading and control which increased the number of members, improved their commitment to the ARBO and encouraged them to participate in meetings and other activities conducted (Figure 8).

The employment of a TAPI also played a significant role in the mentoring and coaching process to make sure that the suggested management practices were consistently performed by the officers. However, since officers of organizations were not permanent, it is recommended that seminars and training workshops be done on a continual basis and mentoring should also be practiced for an effective knowledge transfer. It is also recommended that the mentoring should be focused not only on the actual practice but also on the attitude of the officers towards the management practices introduced because unless they are convinced of the importance of doing, they would not be willing to abide. Continual monitoring and coaching are also important for sustainability purposes.

As of the impact assessment period, some of the primary cooperatives specifically the AARCO, KARBC and SARABCO failed to renew registration because of failure to produce the legal requirements specifically the audited financial reports. Some of them also had not conducted a General Assembly Meeting either due to the busy schedule of some of the officers or because of some trust issues involving some officers.

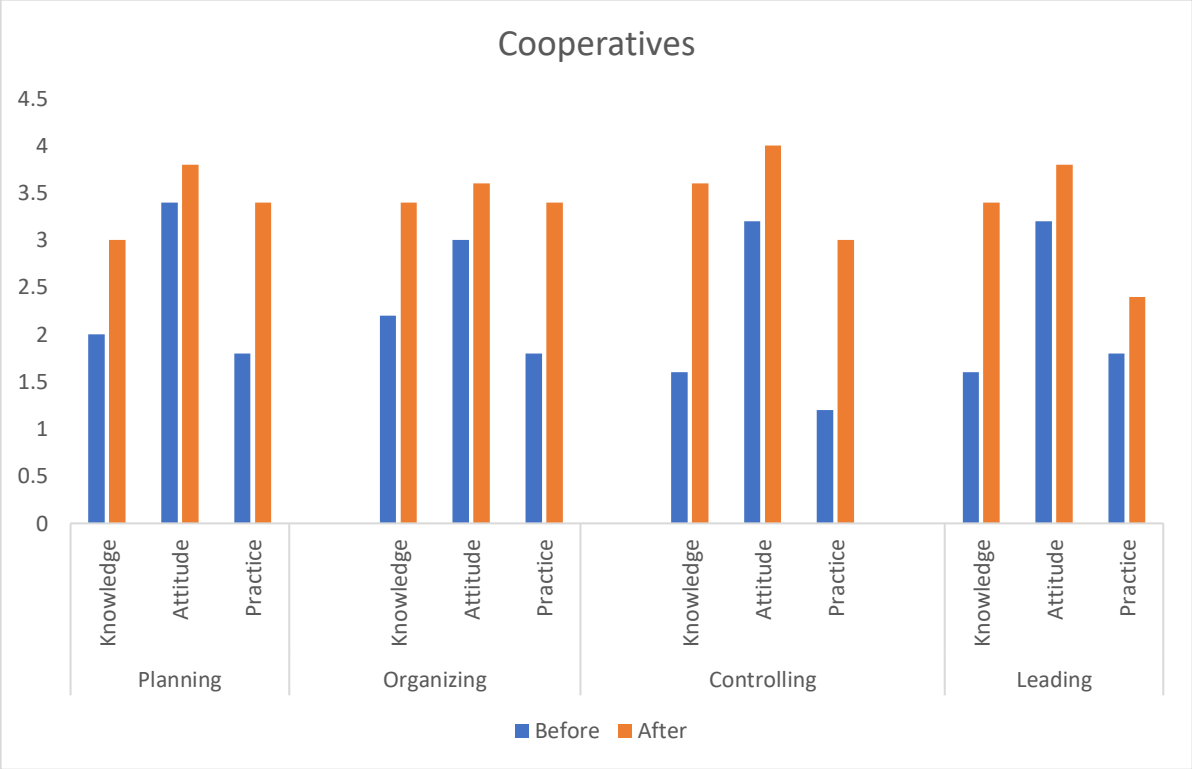


Figure 8. Management knowledge, attitude and practices of the officers of primary cooperatives *before* and *after* ARISP-III

Results of the Management Knowledge, Attitude and Practices (KAP) survey conducted with the officers of the IAs also revealed that before ARISP-III implementation, knowledge on planning, organizing, leading and controlling of the officers was also low. Hence, appreciation on their applicability and usefulness in their respective organizations was also low. Thus, many of the existing associations before ARISP-III were either unregistered or failed to renew registration due to the inability to produce the required documents such as the Constitution and By-Laws, among others (Figure 9).

With the capability building activities conducted during ARISP-III, the IA officers' knowledge on the different planning, organizing, leading and controlling practices improved as shown by the increased mean scores. Better appreciation on the need to apply what they learned from the various trainings was manifested by their strong agreement to actually put into practice what they learned.

The Water Users' Associations were not included in the KAP analysis because the management of the WUAs was taken over by the Barangay Council which traditionally took charge of the management of the water system in the barangay.

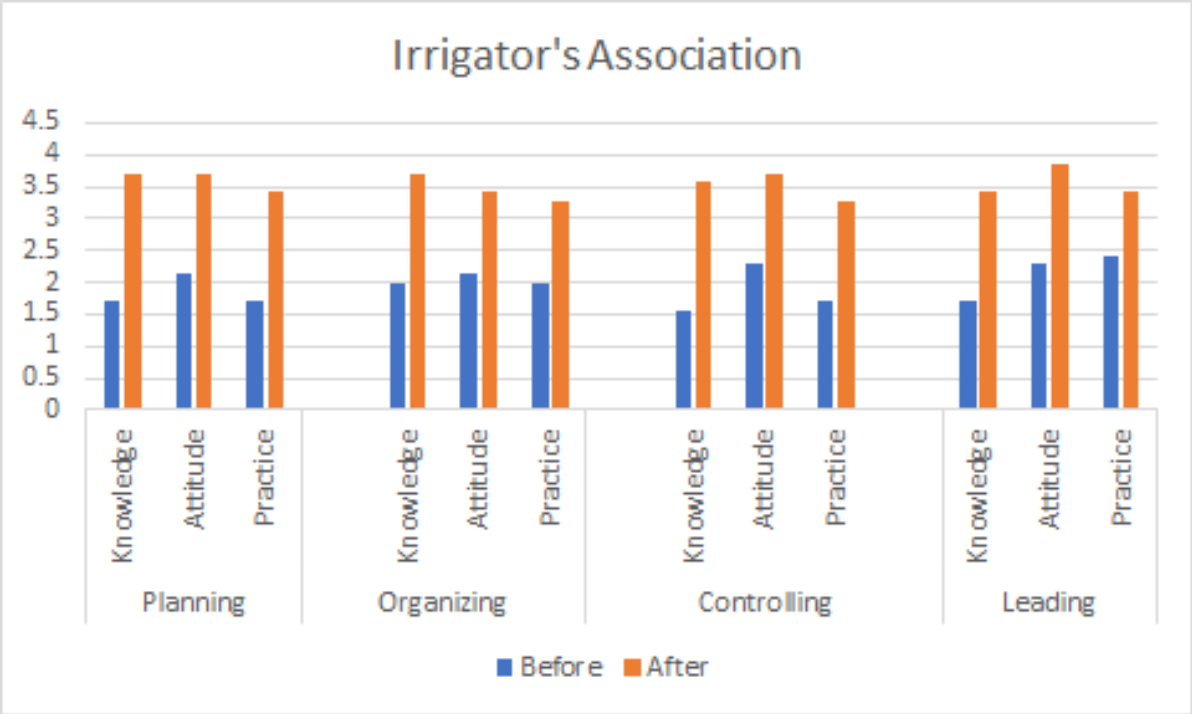


Figure 9. Management knowledge, attitude and practices of the officers of irrigators' associations *before* and *after* ARISP-III

4.4.3.3 Improved Management Practices of ARBOs

Together with a well-defined organizational VMGOs are the organization's strategies that also necessitate the existence of by-laws, policies and practices to assure its successful implementation. These organizational documents serve as guide in the day-to-day decisions and operations of the ARBOs.

With all these necessary elements put in place, the ARISP-III was successful in assisting the ARBOs to organize its BOD, GA and committee meetings as well as the election of BOD and other committee chairmen. Aside from these, the ARBOs were also able to put up savings accounts in a chosen bank or credit cooperative. Auditing and submission of audited financial reports, which is a hallmark of a transparent financial operations, also became regular.

All these improvements in the ARBOs' management are significant outcomes of the capacity building activities conducted by the INSTIDEV component of ARISP-III. It is noteworthy to mention the effective strategy of employing a TAPI which not only conducted some of the seminars but more importantly conducted periodic monitoring and coaching to make sure that the introduced practices were applied consistently.

The improvement in the management practices of the ARBOs can be seen in the increasing frequency of BOD, GA and committee meetings. With ARISP-III, there was an increasing percentage of ARBOs that held monthly and annual meetings for BOD/committee meetings and GA meetings, respectively (Table 56).

Table 56. Management practices of ARBOs *before* and *after* ARISP-III in Biliran and Southern Leyte

Management Practice	Biliran (%)		Southern Leyte (%)	
	Before	After	Before	After
BOD and committee meeting				
Monthly	80	100	66.7	100
Not applicable	20		33.3	
GA meeting				
Annual		100		100
As the need arise	80		66.7	
Not applicable	20		33.3	
Election of BOD				
Annual	80	100	66.7	100
Not applicable	20		33.3	

Another visible outcome of the ARISP-III project is the improvement in the financial practices among ARBOs. *Before* the project, majority of the ARBOs (67% to 80%) did not have audited financial reports. *After* ARISP-III, a great majority of them (75% to 78%) have audited financial report submitted annually (Table 57).

Table 57. Financial practices of ARBOs *before* and *after* ARISP-III in Biliran and Southern Leyte

Management Practice	Biliran (%)		Southern Leyte (%)	
	Before	After	Before	After
Frequency of audit				
None	80	25	66.7	22.2
Annual				77.8
Semi-annual		75		
Not applicable	20		33.3	
Frequency of financial report submission				
None	80	25	66.7	22.2
Annual		75		77.8
Not applicable	20		33.3	

However, due to turnover of officers, sustainability in the practice of introduced management and financial practices became a problem. As a result, some of the ARBOs specifically SARABCO and KARBC were no longer able to produce the required financial reports and other important documents hence were unable to renew registration in the past two years.

4.4.3.4 Improved Productivity and Efficiency of ARBOs

Selected outcome indicators of INSTIDEV interventions on the productivity and efficiency of the ARBOs are presented in Tables 56 to 58. Only a few indicators are included due to lack of the required data from the ARBOs to come up with a better analysis. These indicators vary depending on the type of ARBO.

Primary Cooperatives**.** The indicators for primary cooperatives mainly include attendance in meetings (BOD, committee and GA), rate of receivable collection and number of livelihood enterprises. Primary cooperatives across sites also experienced a general increase in the average attendance during General Assembly Meetings and Board of Directors and Committee meetings (Table 58). General Assembly meetings were usually held annually and has become more regular *after* the ARISP-III. Efficiency in the collection of receivables was also high in some ARCOs like BARC, HARC with ARISP-III. However, KARBC and AARCO have encountered collection problems and have intensified collection efforts while reducing their livelihood activities for the meantime.

Table 58. Selected efficiency indicators for primary cooperatives *before* and *after* ARISP-III implementation in Biliran and Southern Leyte

Indicator	Before	After
Attendance in BOD and committee meetings (%)	60	80-100
Attendance in GA meetings (%)	50-70	90-100
Collection efficiency (%)	No data	20-70
Number of livelihood enterprises	13	32

For the primary cooperatives, the capability building activities resulted to a significant increase in the number and volume of livelihood enterprises engaged in. A sample case was that of the BARC. Before ARISP-III, the cooperative was only limited to small quantity of palay trading with its members as clients due to lack of storage space and the limited financial and managerial capability to engage in more productive livelihood activities. But with the capability building provided to them and the PHFs received, its palay trading grew in volume. In addition, the cooperative ventured into additional livelihood activities such as farm inputs trading, vermiculture, *atsara* or pickles processing, among others. As of the impact assessment period, PhP3M worth in grant from PRDP was given to BARC for the production of organic banana. The cooperative members are continually attending more trainings on food processing such as *moron* making and vinegar, among others, to be able to undertake diversification later on. The Almeria Agrarian Reform

Cooperative also received grant from PRDP, both cash and in kind, for the production of chicken and goat.

Irrigators' Associations. The IAs across project sites also benefited significantly from ARISP-III. The attendance in General Assembly meetings has improved. The ISF collection efficiency also improved as the members learned the importance of cooperation in the management of the irrigation system (Table 59). The members' willingness to contribute their time and labor for the maintenance of irrigation canals also improved as expressed in their willingness to do voluntary cleanup and repair during regularly scheduled *pintakasi*. All these resulted from the members' perception of the important contribution the irrigation facilities have in improving their respective family's economic status.

Table 59. Selected efficiency indicators for irrigators' associations *before* and *after* ARISP-III implementation in Biliran and Southern Leyte

Indicator	Before	After
Average attendance in BOD and committee meetings (%)	20-60	80-100
Average attendance in GA meetings (%)	50-70	60-90
Collection efficiency (%)	50	90
Number of livelihood enterprises	13	32

Water Users' Associations. For some reasons, the management of the WUAs was transferred to the barangay councils in the respective project sites. Historically, management of the barangays' water supply systems was taken care of by the barangay councils. But with ARISP-III, WUAs were organized to manage its potable water project. Due to conflict and confusion among the residents especially the officers of the barangay councils and that of the WUAs, the management of the potable water project was given back to the barangay councils.

Before ARISP-III, most of the sources of potable water for the beneficiary ARC residents were classified as Level III, but the supply was not adequate especially during dry season. Some of the residents living in elevated areas experienced lack of water especially during peak hours of the day. Improvements in the reservoir and in the main and secondary water distribution lines have generally increased the supply of potable water in most areas (Table 60) except in Hingatungan where there was a failure in the design of the reservoir.

Water quality was also good before and after the ARISP-III implementation except in Katipunan where the water from ARISP-III reservoir was not clear due to the presence of small sand particles. Hence, the water was declared not potable and the residents of the barangay have to source drinking water from the old but still functional water system of the barangay and the one constructed by Kalahi-CIDSS. The Balaquid Water Users' Association was also dissolved due to the significant reduction in the supply of water coming from the ARISP-III source due to damaged pipes because of Typhoon Urduja.

Affected residents in Balaquid are currently sourcing drinking water from another water source.

Generally, better maintenance and better understanding among residents were also experienced after the ARISP-III. However, due to conflict among officers and with the members of barangay council, the Balaquid Water Users' Association (BAWASA) became non-operational even during the early stage of its organization.

Table 60. Selected efficiency indicators for water users' associations *before* and *after* ARISP-III implementation in Biliran and Southern Leyte

Indicator	Before	After
Type of service provided	Level II	Level III
Adequacy of water	Relatively inadequate	Adequate most of the time even with increasing population (except in Hingatungan)
Water quality	Good quality with rare rumors of waterborne diseases in some sites	Good quality and no incidence of waterborne diseases (except in Katipunan)
Collection efficiency	Low collection (reluctance of residents to pay)	70% to 95%)
Operation and maintenance	Difficult	Better operation and maintenance services

4.4.4 Outcomes of Agriculture and Agribusiness Development

The AAD Component generated some changes among ARCOs under assessment. These include improved involvement in cooperative activities, gain of personal entrepreneurial competencies (PEC) and improved management practices of the cooperative.

4.4.4.1 Improved Members' Involvement in Cooperative Activities

One of the tangible outcomes of the AAD was the increased participation of members in the livelihood activities. As shown in Table 61, the number of members who actively participated in the cooperatives' activities increased by 75%. This was a result of the members' better understanding on the role of cooperatives in improving their livelihood, better management of cooperatives that attracted more members, and increased understanding of the important contribution of members' involvement to the success of the cooperative. The San Ricardo Agrarian Reform Beneficiaries Cooperative registered the highest increase in active membership of 342%, followed by the Hingatungan Agrarian

Reform Cooperative of 102%. Better understanding of the role of women in cooperative undertaking also led to the significant increase in the involvement of women.

Table 61. Cooperative membership by gender *before* and *after* ARISP-III implementation in Biliran and Southern Leyte

Name of Cooperative	Before			After			Change	
	M	F	Total	M	F	Total	No.	%
Biliran								
Almeria Agrarian Reform Cooperative	12	19	41	40	30	70	29	71
Balaquid Agrarian Reform Cooperative	22	48	70	49	75	124	54	77
Sub-Total	*34*	*67*	*111*	*89*	*105*	*194*	*83*	*75*
Southern Leyte								
San Ricardo Agrarian Reform Beneficiaries' Cooperative	40	20	60	70	195	265	205	342
Katipunan Agrarian Reform Beneficiaries' Cooperative	47	13	60	72	13	85	25	42
Hingatungan Agrarian Reform Cooperative	54	20	74	110	40	150	76	102
Sub-total	*141*	*53*	*194*	*199*	*145*	*339*	*145*	*75*
Total	175	120	305	351	188	533	228	75

Information gathered during the impact assessment revealed that the increase in membership was not sustained as some of the cooperatives already missed general assemby meetings for about two years (*e. g.* SARABCO, AARCO and KARBC). Registration of these primary cooperatives were also revoked by the registering agencies due to the failure to submit the legal documents required.

Of all the primary cooperatives, the Balaquid Agrarian Reform Cooperative and the Hingatungan Agrarian Reform Cooperative were the most active. This implies that survival is really difficult for some cooperatives if left alone. They really need to depend on the technical assistance from government agencies in order to continue adopting the recommended technologies and practices.

4.4.4.2 Personal Entrepreneurial Competencies Gained

Before ARISP-III, the capability of the cooperatives to undertake livelihood opportunities was relatively low. With only one livelihood project undertaken that had low profitability, participation among members had not been that good. Attempts to add more

livelihood enterprises were either a failure or stagnant due to various reasons like lack of capital, low management capability or natural calamities.

The package of intervention provided by ARISP-III such as various trainings and seminars on a wide range of topics, farm demonstrations and educational field trips, among others have improved the capability of the cooperatives to engage in livelihood activities as shown in the aggregate Personal Entrepreneurial Competencies (PEC) of the various ARCOs involved.

The PEC Test is an assessment of the competencies of entrepreneurs in ten entrepreneurial qualities, namely: opportunity seeking (OS), persistence (PR), commitment to work (CW), demand for efficiency and quality (DQ), risk-taking (RT), goal setting (GS), information seeking (IS), systematic planning and organizing (SM), persuasion and networking (PN), and self-confidence (SC) (Figure 10). The highest score that one can get in this entrepreneurial test is 25 which means that a person is strong in that particular quality. A score of 12.5 means that the person has average competency in a particular quality whereas a score below 12.5 means that there is a need for improvement in that particular entrepreneurial quality.

It was found that the officers of the cooperatives have developed strong goal-setting, information seeking, persuasion and networking competencies with information seeking having the highest score. All these competencies especially information-seeking, persuasion and networking were a result of the scarcity of resources that characterized most of the agricultural cooperatives in the country. This served as the motivating force for cooperative officers to look for possible assistance from government and non-government organization which can be a source of help. But more importantly, strong competency on these skills was a product of the many capability building seminars the officers had attended and their experience working and coordinating with various government agencies during the implementation of the ARISP-III. The kind of collaboration and networking the officers were exposed to have been successful in developing in them the needed entrepreneurial qualities.

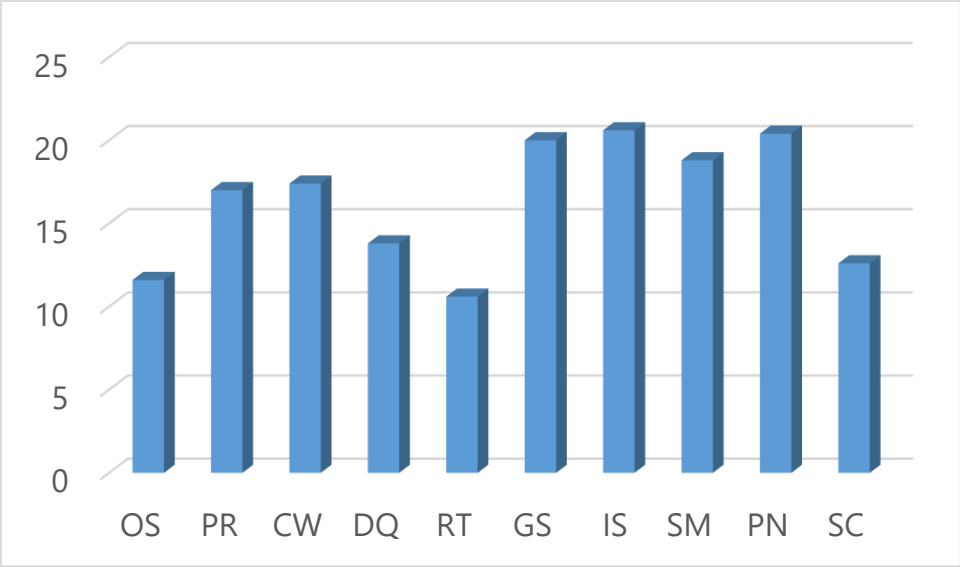


Figure 10. Personal entrepreneurial qualities of the officers of primary cooperatives

Results of the PEC test also revealed that the officers of the cooperatives had average competencies in self-confidence and demand for efficiency and quality. This suggests that the officers involved are learning from the strategic planning seminars but have not yet developed enough persistence and commitment to work as far as implementation of the planned project is concerned. Officers and members of the ARCOs are mostly small farmers who also need to spend time in other income generating activities for their family, hence they cannot fully commit to cooperative's activities. More mentoring, hands-on participation, and observation on how other organizations do things successfully, would give the concerned officers the needed persistence and commitment to do things efficiently and effectively.

However, on average, the officers were found to have low competency in opportunity-seeking and risk-taking. This weakness was common to farmer organizations whose officers and members were used to the old extension paradigm of dole outs which limits the opportunity of going through the critical process of analyzing problems and formulating alternative courses of action to identified problems. This competency level was affected by the officers' seemingly dependent attitude when leading a cooperative and undertaking common projects due to the presence of field technicians from government and non-government organizations who provided them with continual assistance in almost all project undertakings. More values education, independent work and education on the value of the resources entrusted to them and teaching them to develop accountability that goes with every responsibility they willingly accept would bring their competencies to a higher level. Also conducting training on management control is very important to address this concern.

4.4.4.3 Improved Management Practices of the Cooperative

The INSTIDEV Component of ARISP-III was designed to strengthen the agrarian reform cooperatives, making them capable to engage in various entrepreneurial activities. With a more empowered officers and members, meetings of the Board of Directors and committee meetings became a regular monthly activity and the General Assembly meetings that include, among others financial reporting and elections of officers also became a regular annual activities rather than being conducted as the need arise (Table 62).

The role of the TAPI has significantly impacted the way the cooperative officers performed their respective duties and responsibilities in the ARCs. The one-on-one coaching and periodic follow up conducted by the TAPI was successful in equipping the officers with skills in the preparation of cooperative reports such as income statement, cashflow, balance sheet and minutes of meetings, among others.

With the improved skills and better understanding of the management responsibilities that goes with position in the ARCO, and the management tools introduced during trainings, strategic plans for business and service as well as agribusiness manuals were prepared by most of the cooperatives during the ARISP-III. However, only BARC and HARC were able to prepare strategic plans for service because only these cooperatives have well-defined service enterprises. Submission of periodic reports such as cashflow and statement of operations along with other financial reports were presented for annual internal and external auditing by most of the cooperatives.

4.5 Project Impacts

Three dimensions of impact of the ARISP-III were considered in the assessment. These included economic, social and environmental impacts which were assessed using both quantitative and qualitative approaches. The quantitative evaluation employed propensity score matching (PSM), difference-in-difference (DID) method, technical efficiency and productivity analysis as well as factor share analysis. Meanwhile, the qualitative indicators were determined by analyzing the MSC stories narrated by the project beneficiaries.

4.5.1 Economic Impact

The primary economic impacts of the ARISP-III considered in the assessment were palay productivity and farm income. PSM and DID were employed to evaluate these impacts between beneficiaries and non-beneficiaries. Moreover, technical efficiency and factor share analyses were employed to determine the effects of said indicators among beneficiaries *before* and *after* availment of the ARISP-III services specifically provided by CIS/CIP projects.

Aside from the productivity and profitability of palay, the impact of the ARISP-III on the financial performance and status of primary cooperatives was also assessed.

Table 62. Management practices and tools adopted by the agrarian reform cooperatives in Biliran and Southern Leyte

Management Practices and Tools	Biliran				Southern Leyte					
	AARCO		BARC		KARBC		HARC		SARABCO	
	Before	After	Before	After	Before	After	Before	After	Before	After
BOD meeting	As the need arise	Monthly	Monthly	Monthly	As the need arise	Monthly	As the need arise	Every Month	As the need arise	Monthly
GA meeting	As the need arise	Annual	Annual and during emergency	Annual and during emergency	As the need arise	Annual	As the need arise	Annual	As the need arise	Annual
Constitution & By-Laws	None	1	1	1	None	1	None	1	None	1
Operations manual	None	1	None	1	None	1	None	1	None	1
PSPs for business	None	None	None	1	None	3	None	4	None	2
PSPs for service	None	None	None	1	None	None	None	1	None	None
Agribusiness manual	None	None	None	1		1		1		1
Frequency of audit	Annual	Annual	None	Annual	None	Annual	None	Annual	None	Annual
Frequency of financial report submission	Annual	Annual	None	Annual	None	Annual	None	Annual	None	Annual

4.5.1.1 Propensity Score Matching

A crucial point in any impact assessment is coping with selection bias. This happens when there are systematic differences between households in the treated group and in the control group. For this study, the treated group is composed of households who are beneficiaries of the ARISP-III in Biliran and Southern Leyte. On the other hand, the control group involves the randomly selected non-beneficiary households in both provinces.

To estimate the impact of the project, the outcomes of the treated group were compared with the control group. However, comparing the beneficiary and the non-beneficiary group without regard to its inherent differences might lead to a large bias. If, for example, households in the beneficiary group are on average more educated, have bigger farms and own more assets than those in the non-beneficiary group (or the other way around), then the effect of the ARISP-III is biased upwards (or downwards) since education, farm and household assets have a most likely positive impact on income. To control such selection bias, the quantitative approach of the project matched beneficiary and non-beneficiary households with the same observable characteristics before doing the comparison. Only similar households were used in comparison and households that were systematically different were not included in the analysis.

In order to determine whether there are inherent differences between the beneficiary and non-beneficiary group, there is a need to check whether there are significant differences in the socio-economic characteristics of the respondents. To do this, mean comparison using independent sample t-test between beneficiary and non-beneficiary group was done. Table 63 shows the descriptive statistics of the surveyed respondents. It outlines the similarities and differences between the beneficiary and non-beneficiary group of farmers on observable characteristics. On average, the household head for the beneficiary group was 56.6 years old while that for the non-beneficiary group was 55 years old. Close to 90% of the respondents had a male household head. The formal years of education of the household head was a year lower than the spouse. Households for both the beneficiary and non-beneficiary groups had around five members. In terms of house ownership, around 93% of the respondents owned their houses. More than 40% and around 20% of those in the beneficiary and non-beneficiary groups, respectively, owned the land they were tilling. In terms of experience, farmers had been in agriculture for over 20 years. Those in the beneficiary group were into rice farming for around 27 years while those in the non-beneficiary group produced palay for around 23 years. The farmer-respondents had an average farm size of a little over 1.0 ha. On average, the beneficiary group cultivated 1.2 ha while the non-beneficiary group tilled about 1.3 ha. The distance of households to the nearest water source differed by groups. On average, the beneficiary group were nearer the water source (around 1.5 km) compared to the non-beneficiary group (about 2.9 km).

Table 63. Summary statistics of the socio-demographic characteristics of ARISP-III beneficiaries and non-beneficiaries in Biliran and Southern Leyte, 2018

Variable	Beneficiary (n = 228)	Non-Beneficiary (n = 150)	t	p>t
Age of household head	56.57	54.96	1.20	0.229
Male household head	0.87	0.88	-0.21	0.836
Education of household head	8.41	8.49	-0.19	0.852
Education of spouse	9.35	10.13	-0.78	0.435
Household size	4.81	4.89	-0.38	0.705
House ownership	0.93	0.93	0.03	0.973
Land ownership	0.44	0.19	5.16***	0.000
Years of farming	26.90	23.28	2.37**	0.019
Farm area	1.20	1.32	-0.65	0.515
Water source distance	1,553	2,947	-3.53***	0.000
Asset index	0.19	0.22	-1.63***	0.100
4Ps benefits	3,772	4,562	-0.76	0.447
Food expenditure	1,363	1,551	-1.64*	0.100

Note: *** p<0.01, ** p<0.05, * p<0.1

In terms of asset ownership, an index was computed aggregating different assets owned by the respondents from farm tools, agricultural assets to housing appliances. The asset index was estimated using principal component analysis and the first score was used as the proxy for asset index. The values were standardized from 0 to 1. An index closer to 1 implied asset-rich households while an index closer to 0 signified asset-poor households. The beneficiary group had relatively lower asset index compared to the non-beneficiary group. Table 63 shows that the average asset index for the beneficiary group was around 0.19 while for the non-beneficiary group was around 0.22. The surveyed respondents were also asked regarding the income they received from government support program such as 4Ps program. The average monthly income reported by the beneficiary group from 4Ps was PhP 3,772 while the non-beneficiary group reported a relatively higher average support of PhP 4,562 per month. With regards to consumption, the average monthly food expenditure of the beneficiary and non-beneficiary groups was PhP1,363 and PhP1,551, respectively.

The initial comparison using the parametric t-test for independent groups shows that there are inherent differences in the socio-economic characteristics between the beneficiary and non-beneficiary groups. Table 63 shows that the two groups differ significantly in some observable characteristics. In particular, respondents differ in terms of land ownership, years of farming, distance of households from the nearest water source, asset index and average monthly food expenditure. On the other hand, t-values that are not significant indicate similarities between the beneficiary and non-beneficiary groups. Results suggest that there is a need to balance the characteristics between two groups to avoid bias in comparing observable characteristics.

As highlighted in Table 63, there are significant and inherent differences between households in the beneficiary and non-beneficiary groups. Immediately comparing outcome variables using the data from Table 63 would yield bias results because the two groups had systematic differences. This suggests that there is a strong need to balance household characteristics. In this regard, Gertler *et al*. (2016) recommend to construct a more appropriate control group using the propensity score matching technique. Hence, to reduce the differences on observable characteristics observed in Table 63, the propensity score matching technique was used to match households with similar observable characteristics.

The basic idea of matching is to find for each household (beneficiaries and non-beneficiaries) a close resemblance in socio-economic indicators such as age, education, farm size and others. Table 64 presents the results of logit regression in estimating the propensity score of the respondents or the probability of being selected as part of the beneficiary of the project. The dependent variable is binary in nature reflecting 1 for beneficiary households and 0 for non-beneficiary households. The coefficient presented are log-odds. Results highlight several characteristics that appear to be significant predictors of being randomly chosen as a beneficiary of the ARISP-III. The significant variables include distance of households to the nearest water source, land ownership and asset index. Results of logit estimation from Table 64 were used in estimating the propensity score between the beneficiary and non-beneficiary farmers.

Table 64. Logit regression in estimating propensity score with beneficiary (1 beneficiary and 0 non-beneficiary) as dependent variable

Variables	Coefficients	Std. Err.
Age of household head	-0.0034	0.0175
Male household head	-0.0832	0.9283
Education of household head	0.0170	0.0471
Education of spouse	-0.0058	0.0220
Household size	0.0510	0.0804
House ownership	-0.5603	0.7322
Farm area	-0.0986	0.1594
Distance to water source	-0.0002**	0.0001
Years of farming	0.0135	0.0154
Land ownership	1.3967***	0.4163
Asset index	-2.3024*	1.4207
Income 4Ps	0.000002	0.00002
Monthly food expenditure	-0.0002	0.0001
Constant	1.6475	1.5510
Observations	210	
Pseudo R-square	0.1062	

Note: *** p<0.01, ** p<0.05, * p<0.1,
Log likelihood = -116.8419, LR chi2(13) = 27.76, Prob > chi2 = 0.0098

The choice of the explanatory variables is based on the premise that the selected covariates should satisfy two vital conditions. First, these variables should influence both the probability of being selected to be part of the beneficiary group as well as the impact of the project. Second, these variables should not be changed by the treatment itself. In

line with these requirements, the propensity score is estimated based on related household and farm characteristics, educational background of the household head and spouses and other observable characteristics. A number of different models are compared for the estimation of the propensity score. As more variables are included in the model, fewer overlaps between two groups are detected and the sample size tends to reduce significantly. Sufficient overlap of densities between the beneficiary and non-beneficiary households is vital for the successful matching of households using the estimated propensity score. The model used is based on the kernel density estimate of the propensity score distribution between both the beneficiary and non-beneficiary groups. However, a noticeable drawback of the propensity score matching is the reliance on the so-called assumption of unconfoundedness. This means that it is assumed that all relevant differences between treated and non-treated individuals are captured by the covariates X, and therefore assignment to treatment P is not influenced by further unaccounted covariates (Klasen *et al*., 2011).

4.5.1.2 Matching Methods and Average Treatment Effect of the Treated

After estimating the propensity score, the second step taken is to match households in the beneficiary group to the non-beneficiary group. There are various and well-established algorithms available in the literature for matching two groups. For this study, three common matching techniques are employed, namely: *k*-nearest neighbour matching, radius matching and kernel matching.

Table 65 shows the balancing of covariates after conducting nearest neighbour matching. It indicates that after matching, the beneficiary and non-beneficiary households are comparable based on the selected household characteristics. The t-value of means comparison is below the critical level suggesting that there are no systematic differences between two groups. Before matching, Table 63 shows that households in the beneficiary group and non-beneficiary group differ systematically in some household characteristics but after estimating the propensity score and matching similar households, Table 65 reports that are no significant differences in the observable characteristics between two groups. However, this matching is at the expense of reduction in sample size. The raw data show that the sample for the beneficiary is 228 and the non-beneficiary is 150 respondents. After matching, the number of respondents from the beneficiary group is reduced to 144 respondents and the number of respondents for the non-beneficiary group was only 66. The propensity score matching method is a data-intensive technique hence it is recommended to have a large sample size so that a sufficient number of samples will be left after matching. With the reduction of sample size, the characteristics of the respondents are homogenized. This implies that the inherent bias between the two groups has been reduced so comparing differences in income and other outcome variables was expected to be more reliable.

Table 65. Balancing of covariates after matching

Variable	Beneficiary (n = 144)	Non-beneficiary (n = 66)	t	p>t
Age of household head	54.83	54.36	0.34	0.734
Male household head	0.97	0.98	-0.82	0.411
Education of household head	8.23	8.16	0.14	0.890
Education of spouse	9.74	8.53	1.51	0.133
Household size	5.28	5.67	-1.34	0.181
House ownership	0.94	0.93	0.25	0.803
Land ownership	0.37	0.36	0.25	0.803
Years of farming	25.49	24.41	0.72	0.474
Farm area	1.11	1.15	-0.34	0.735
Water source distance	1,395	1,382	0.05	0.962
Asset index	0.20	.20	0.16	0.874
4Ps benefits	4,228	5,594	-1.20	0.232
Food expenditure	1,482	1,498	-0.18	0.857

Figure 11 shows the distribution of propensity scores among beneficiary and non-beneficiary households with common support imposed. It presents sufficient overlaps in the propensity score. The common support region ensured that the propensity score was balanced across beneficiary and non-beneficiary households. All the propensity scores within this region indicated that any combination of characteristics observed in the beneficiary households can also be observed among the non-beneficiary households. This supports Table 65 showing that households in both groups were balanced in terms of their observed characteristics. In addition to Figure 11, Figure 12 shows the changes in propensity scores before and after matching. Before matching the densities of beneficiary and non-beneficiary groups were quite different in shape and in distribution but after matching, there was a degree of similarity between two groups. Results suggest that selection bias from inherent differences between the two groups has been addressed by way of propensity score matching.

After estimating the propensity score, imposing common support region and ensuring that the balancing property was satisfied. The impact of ARISP-III in Biliran and Southern Leyte was estimated using the average treatment effect of the treated (ATT). The ATT was calculated as the difference of means between beneficiary and non-beneficiary groups after matching. The average difference in outcomes between the beneficiary and their matched comparison captured the estimated impact of ARISP-III. In summary, the project's impact was derived by comparing the average outcomes (yield and farm income) among the statistically matched subgroup of households using observable characteristics. The propensity score matching estimator for ATT was the mean difference in outcomes between beneficiaries and non-beneficiaries with common support imposed, appropriately weighted by the propensity score distribution of the beneficiary group. The estimated impact using ATT was expressed using the following form:

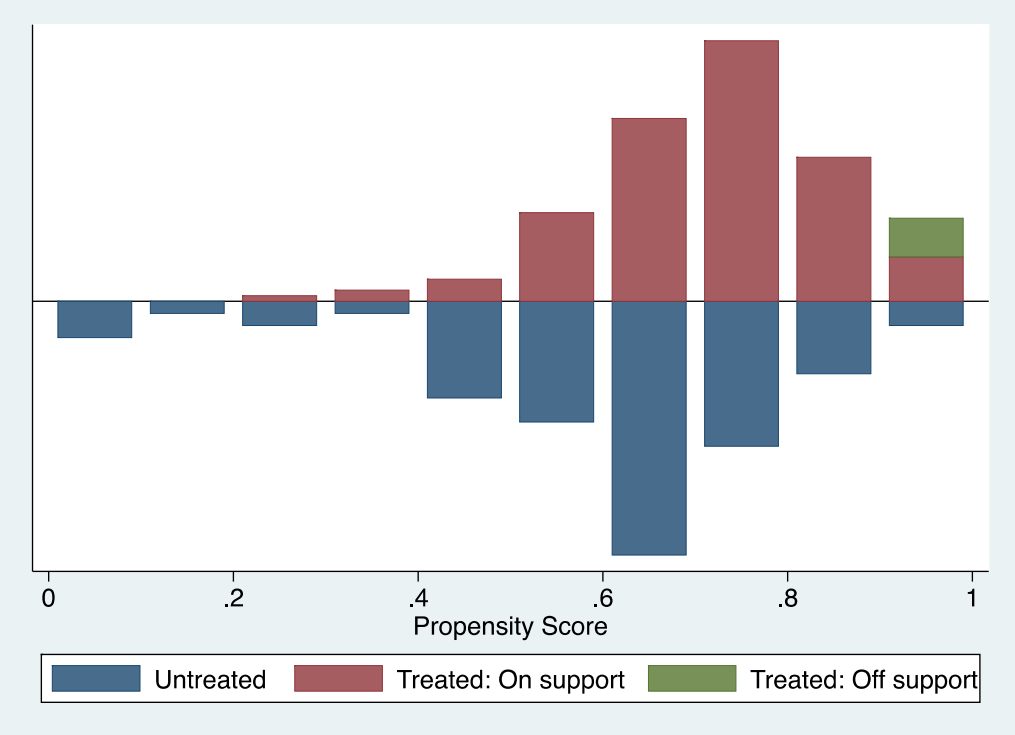


Figure 11. Propensity scores of the beneficiary and non-beneficiary households with common support imposed

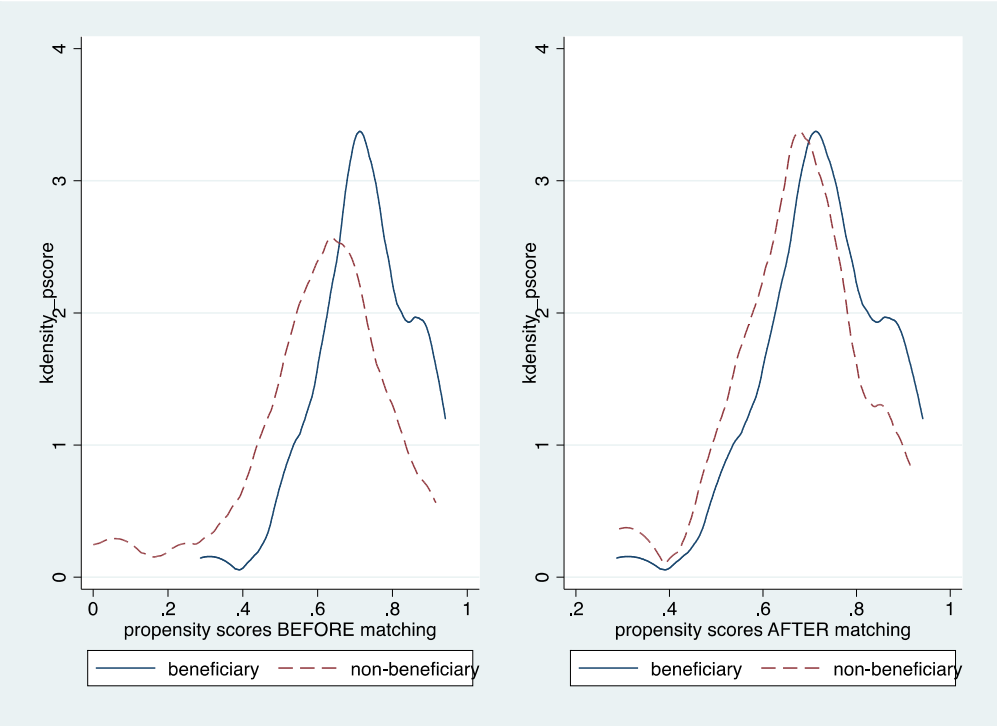


Figure 12. The density of propensity scores *before* and *after* matching

$$\partial_{ATT} = E\ [\{E[Y_1 \mid P(X_i), T_i = 1] - E[Y_0 \mid P(X_i), T_i = 0]\} \mid T_i = 1] \quad (10)$$

where:

$P(X_i) = Pr(T = 1 \mid X_i) = E[T_i \mid X_i]$ = conditional probability or propensity score
T = binary variable 1 for beneficiary group and 0 for non-beneficiary
Y_1 = outcome variable (yield and farm income) for the beneficiary group
Y_0 = outcome variable (yield and farm income) for the non-beneficiary group

4.5.1.3 Estimating Impact on Yield and Income of Palay Farmers

Table 66 shows the results of k-nearest neighbour, radius and kernel matching. The impact variable is average palay yield measured in mt/ha per production/cropping season. The palay production of farmers from the non-beneficiary group serves as a comparison.

Table 66. Impact of ARISP-III on palay yield (in mt/ha) using matching estimates in Biliran and Southern Leyte

Yield	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (mt)	3.3964	3.3964	3.3964
Non-beneficiary (mt)	2.8201	3,0432	3.0258
ATT (rice yield in mt/ha)	0.5763**	0.3532*	0.3706*
Bootstrap SE§	260.78	207.17	206.80
z	2.21	1.70	1.79
P>|z|	0.027	0.088	0.073
Beneficiary (n)	137	137	137
Non-beneficiary (n)	66	66	66

Note: § Standard error was bootstrapped and replicated 50 times
** p<0.05, * p<0.1
Balancing property satisfied and common support imposed

A positive ATT value can be interpreted as a positive impact of the ARISP-III intervention on palay productivity. Results show that palay yield of the beneficiary group is relatively higher than the non-beneficiary group. The ATT result is robust across several matching techniques. This implies that there is consistent positive significant impact on palay production. For the nearest neighbour matching, the improvement in palay production, on average, is around 0.576 mt/ha while for the radius matching, improvement in rice production is around 0.353 mt/ha. On the other hand, the kernel matching shows an improvement in rice production of around 0.371 mt/ha.

A great number of the beneficiary respondents (44%) obtained palay yield in the range of about 1.70 to 3.199 mt/ha (Table 67) while more than half of the non-beneficiary (56%) obtained the same yield range. This was followed by those who obtained rice yield ranging from 3.20 to 4.699 mt/ha. There were substantial number of beneficiary respondents who obtained rice yield of more than 4.700 mt/ha.

Table 67. Comparative distribution of palay yield (mt/ha in intervals) per cropping season between beneficiary and non-beneficiary respondents in Biliran and Southern Leyte

Yield Range (mt/ha)	Beneficiary		Non-Beneficiary	
	No.	%	No.	%
below 1.700	16	11.85	6	9.09
1.700 – 3.199	59	43.70	37	56.06
3.200 – 4.699	35	25.93	17	25.76
4.700 – 6.199	17	12.59	4	6.06
above 6.200	8	5.93	2	3.03
Total	135	100	66	100

Table 68 shows the estimated impact of ARISP-III intervention on the gross income of farmers per hectare per year. The farmer-beneficiaries obtained significantly higher gross income compared to the non-beneficiary group. The increase in rice yield reported in Table 66 was translated to higher gross income. Across several matching techniques, the estimated increase in gross income per ha per cropping season is consistently averaging at around PhP15,000.

Table 69 indicates that more farmers (43%) who are beneficiaries of ARISP-III obtained gross income between PhP45,000 to PhP79,999 per ha per cropping season. Consequently, more than half of non-beneficiaries (52%) obtained a gross income relatively lower than beneficiaries (below PhP45,000 per ha).

Table 68. Impact of ARISP-III on gross income (PhP/ha) per cropping season using matching estimates in Biliran and Southern Leyte

Gross Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	64,114.75	64,114.75	64,114.75
Non-beneficiary (PhP)	48,405.72	48,214.53	48,978.88
ATT (PhP/ha)	15,709.03***	15,900.22***	15,135.87***
Bootstrap SE[§]	5,866.75	4,078.58	4,697.18
z	2.68	3.90	3.22
P>|z|	0.007	0.000	0.001
Beneficiary (n)	137	137	137
Non-beneficiary (n)	66	66	66

Note: [§] Standard error was bootstrapped and replicated 50 times
*** p<0.01
Balancing property satisfied and common support imposed

Table 69. Comparative distribution of gross income (PhP/ha in intervals) between beneficiary and non-beneficiary respondents in Biliran and Southern Leyte

Gross Income	Beneficiary		Non-Beneficiary	
	No.	%	No.	%
below 45,000	41	30.15	34	51.52
45,000 - 79,999	59	43.38	26	39.39
80,000 - 114,999	24	17.65	5	7.58
115,000 - 149,999	10	7.35	1	1.52
above 150,000	2	1.47	-	
Total	136	100	66	100

Table 70 presents the estimated impact of ARISP-III on the net income of farmers. Results show that even though project beneficiaries posted positive average net income of about PhP4,100 per ha per cropping season, the estimated impact of the project produced mixed results. On one hand, nearest neighbour matching and kernel matching showed positive but not significant ATT values. On the other hand, the ATT value of the radius matching was negative but still not significant. Though there was a significant increase in yield, the increase in production did not translate to robust increase in net income. Market barriers and inefficiency could have potentially influenced the impact on net income of farmers.

The analysis in Table 70 focuses on the net income and this includes the implicit costs of farmers such as family labor and other owned resources. It shows that net income of farmer beneficiaries was approximately PhP4,100 per ha per cropping season. If these implicit costs are disregarded, the income above implicit costs of farmers becomes relatively higher at around PhP15,400 per ha per cropping season (Table 71). Even though the income above implicit costs of beneficiaries is positive, the estimated impact using ATT still produced mixed and not significant results. For the nearest neighbour and kernel marching, the ATT estimate is positive but not significant. On the other hand, for the radius matching, the estimated impact on income above implicit cost is negative but not significant. These results cast doubt on the effectiveness of the project in increasing the income above implicit cost of farmers.

Table 70. Impact of ARISP-III on net income of farmers (PhP/ha) per cropping season using matching estimates in Biliran and Southern Leyte

Net Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (Php)	4,093.90	4,093.90	4,093.90
Non-beneficiary (Php)	-7,434.02	8,594.05	-3,894.06
ATT (Php/hectare)	11,527.92	-4,500.15	7,987.96
Bootstrap SE[§]	7,863.78	3,324.745	7105.099
z	1.47	-1.35	1.12
P>|z|	0.143	0.176	0.261
Beneficiary (n)	62	62	62
Non-beneficiary (n)	137	137	137

Note: [§] Standard error was bootstrapped and replicated 50 times
Balancing property satisfied and common support imposed

Table 71. Impact of ARISP-III on income above implicit costs of farmers (PhP/ha) per cropping season using matching estimates in Biliran and Southern Leyte

Income Above Implicit Cost	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	15,384.01	15,384.01	15,384.01
Non-beneficiary (PhP)	11,058.71	18,826.03	13,579.97
ATT (PhP/hectare)	4,325.29	-3,442.02	1,804.04
Bootstrap SE[§]	8,480.97	3697.43	6,104.82
z	0.51	-0.93	0.30
P>|z|	0.610	0.352	0.768
Beneficiary (n)	62	62	62
Non-beneficiary (n)	137	137	137

Note: [§] Standard error was bootsrtapped and replicated 50 times
Balancing property satisfied and common support imposed

Since one of the ARISP-III interventions focused on improving the irrigation system of the rice farmers, it was relevant to evaluate the impact on productivity and income during the dry season only. It was important to note that the non-beneficiary farmers also had existing irrigation systems only, that these were not included in the interventions of ARISP-III. Table 72 shows the ATT estimations comparing the yield per ha during the dry season for the ARISP-III beneficiary and non-beneficiary groups. Results show that the beneficiary farmers have a relatively higher yield compared to the non-beneficiary but the increase in yield is not statistically significant. For the nearest neighbour matching the estimated increase in yield is 0.412 mt/ha during the dry season while for the radius matching the increase in yield is around 0.272 mt/ha. On the other hand, kernel matching estimated an average increase in yield of 0.261 mt/ha.

During dry season, most of farmers' palay yield falls in the range 1.70 to 4.699 mt/ha, regardless of being a beneficiary or not (Table 73). Among beneficiary group, there are substantial number of farmers who attained rice yield of more than 4.70 mt/ha.

Table 72. Impact of ARISP-III on palay yield (mt/ha) focusing on dry season only in Biliran and Southern Leyte

Yield	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (mt)	3.6762	3.6761	3.6761
Non-beneficiary (mt)	3.2638	3.4039	3.4143
ATT (rice yield in mt/ha)	0.4124	0.2722	0.2618
Bootstrap SE[§]	308.58	229.77	241.23
z	1.34	1.18	1.09
P>|z|	0.181	0.236	0.278
Beneficiary (n)	137	137	137
Non-beneficiary (n)	66	66	66

Note: [§] Standard error was bootstrapped and replicated 50 times
Balancing property satisfied and common support imposed

Table 73. Rice yield (mt/ha in intervals) of beneficiaries and non-beneficiaries during dry season in Biliran and Southern Leyte

Dry Season Yield	Beneficiary		Non-Beneficiary	
	No.	%	No.	%
below 1.700	13	9.49	6	9.09
1.700 – 3.199	45	32.85	24	36.36
3.200 – 4.699	43	31.39	27	40.91
4.700 – 6.199	22	16.06	7	10.61
above 6.200	14	10.22	2	3.03
Total	137	100	66	100

Meanwhile, Table 74 presents the comparison of gross income of farmers during the dry season only. Results show that the beneficiary group of farmers have relatively higher gross income compared to the non-beneficiary group. The estimated average increase in gross income per hectare during the dry season is around PhP15,000. This increase in income is statistically significant across several matching estimates implying that the positive impact is robust across specifications.

Close to half of the beneficiaries (47%) obtained a gross income ranging from PhP44,000 to PhP83,999 per ha during dry season. Similar observation can be drawn for the non-beneficiary group with more than half of the non-beneficiaries (55%) who generated the same range of gross income (Table 75).

Table 74. Impact of ARISP-III on gross income (PhP/ha) during the dry season only in Biliran and Southern Leyte

Gross Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	69,480.64	69,480.64	69,480.64
Non-beneficiary (PhP)	54,789.58	53,967.81	54,964.62
ATT (PhP/ha)	14,691.06**	15,512.83***	14,516.02**
Bootstrap SE[§]	6,533.39	4,133.12	6,693.01
z	2.25	3.75	2.17
P>|z|	0.025	0.000	0.030
Beneficiary (n)	137	137	137
Non-beneficiary (n)	66	66	66

Note: [§] Standard error was bootstrapped and replicated 50 times
*** p<0.01, ** p<0.05
Balancing property satisfied and common support imposed

Table 75. Gross income (PhP/ha in intervals) of beneficiaries and non-beneficiaries during dry season only in Biliran and Southern Leyte

Gross Income	Beneficiary		Non-Beneficiary	
	No.	%	No.	%
Below 44,000	34	24.82	24	36.36
44,000 - 83,999	65	47.45	36	54.55
84,000 - 123,999	26	18.98	5	7.58
124,000 - 163,999	8	5.84	1	1.52
above 164,000	4	2.92	-	-
Total	137	100	66	100

For the net income of farmers, Table 76 shows the estimated impact of ARISP-III during dry season. The availability of irrigation infrastructure is necessary for farmers to sustain rice production during dry season. However, results show mixed impact of the irrigation infrastructure support project of ARISP-III on the net income of farmers. On one hand, nearest neighbour matching and kernel matching show positive but not statistically significant ATT values. On the other hand, the ATT value of the radius matching is negative but still not significant. These results imply that the impact of ARISP-III program on the net income of farmer-beneficiaries in Biliran and Southern Leyte during dry season is statistically the same with non-beneficiaries.

Meanwhile, Table 77 shows the impact of the project on income not taking into account the implicit costs. These implicit costs include family labor, other family resources, self-owned inputs and self-owned resources used in rice production during dry season. Without counting the implicit costs, the cost incurred in the production will be relatively lower resulting to a relatively higher income above implicit costs as compared to the values in Table 74. Results show that the average income of farmer beneficiaries above implicit costs during dry season is more than PhP18,000 per ha. With regards to impact estimate, the ATT value has mixed results with a value as low as negative PhP4,800 to as high as positive PhP3,800. However, all ATT estimates from different matching methods are not significant. This shows that there is no sufficient statistical evidence to claim that ARISP-III generated positive impact on the income above implicit cost of farmers in Biliran and Southern Leyte during dry season.

4.5.1.4 Estimating Impact on Yield and Income of Palay Farmers by Income Group

To further evaluate the estimated impact of the ARISP-III, the sample farmer respondents were stratified by income groups. Households were divided into two groups: (i) household below the poverty line and (ii) households above the poverty line. The poverty threshold used was the 2015 estimated minimum income needed. According to the Philippine Statistical Authority (PSA, 2016), a family of five needed, on average, at least PhP9,064 monthly income to meet basic food and non-food needs in 2015. Using this 2015 poverty threshold, the household respondents in Biliran and Southern Leyte were classified into poor and non-poor groups based on survey results of the estimated household income. Households with annual income of more than PhP108,768 were categorized into non-poor while those with income of PhP108,768 and below were categorized as poor.

Table 76. Impact of ARISP-III on net income (pesos/ha) of beneficiaries and non-beneficiaries during dry season in Biliran and Southern Leyte

Net Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	7,797.38	7,797.38	7,797.38
Non-beneficiary (PhP)	-14,855.22	10,305.29	-9,903.42
ATT (PhP/ha)	22,652.6	-2,507.92	17,700.79
Bootstrap SE§	13,653.55	5,820.92	11,821.93
z	1.66	-0.43	1.50
P>|z|	0.097	0.667	0.134
Beneficiary (n)	62	62	62
Non-beneficiary (n)	137	137	137

Note: § Standard error was bootstrapped and replicated 50 times
Balancing property satisfied and common support imposed

Table 77. Impact of ARISP-III on income above implicit cost (PhP/ha) during the dry season only in Biliran and Southern Leyte

Income Above Implicit Cost	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	18,712.34	18,712.34	18,712.34
Non-beneficiary (PhP)	14,932.16	23,536.88	17,515.21
ATT (PhP/ha)	3,780.18	-4,824.54	1,197.13
Bootstrap SE§	7,097.23	3,987.28	7,279.89
z	0.53	-1.21	0.16
P>|z|	0.594	0.226	0.869
Beneficiary (n)	62	62	62
Non-beneficiary (n)	137	137	137

Note: § Standard error was bootstrapped and replicated 50 times
Balancing property satisfied and common support imposed

By stratifying the analysis by income group, variations between rich and poor households were homogenized. Table 78 shows that a total of 242 respondents were classified as poor while 136 respondents were categorized as non-poor. With limited respondents, fewer matched households using propensity score matching was anticipated.

Table 78. Stratification of respondents by income group in Biliran and Southern Leyte

Type of Respondent	Below Poverty Line		Above Poverty Line	
	No.	%	No.	%
ARISP-III beneficiary	163	67.36	65	47.79
Non-beneficiary	79	32.64	71	52.21
Total	242	100	136	100

For the analysis below the poverty line, Table 79 shows that there is a considerable decrease in the number of households that were matched. Only 93 households for the beneficiary group and 28 households for the non-beneficiary were included in the analysis. Nevertheless, the stratification of the sample size allowed further examination to whom impact was felt most.

Table 79. Impact of ARISP-III on rice yield (mt/ha) per cropping season for farmers below the poverty line in Biliran and Southern Leyte

Yield	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (mt)	3.2351	3,235.06	3,235.06
Non-beneficiary (mt)	2.4113	2,731.82	2,613.00
ATT (rice yield in mt/ha)	0.8238*	0.5033*	0.6221*
Bootstrap SE§	446.63	270.78	379.09
z	1.84	1.86	1.64
P>|z|	0.065	0.063	0.100
Beneficiary (n)	93	93	93
Non-beneficiary (n)	28	28	28

Note: § Standard error was bootstrapped and replicated 50 times
* p<0.1
Balancing property satisfied and common support imposed

Moreover, the results show that the average yield per ha for the beneficiary group is around 3.20 mt while the non-beneficiary group ranges from around 2.40 to 2.70 mt/ha. Across three matching techniques, results show a significant difference in the palay yield between the beneficiary and non-beneficiary groups below the poverty line. The impact estimated using the average treatment effect of the treated (ATT) ranges from 0.50 to 0.80 mt/ha per cropping season. This captures the difference in yield between the beneficiary and non-beneficiary group. Though the results are only significant at 10%, these are robust across different matching techniques implying that farmer-beneficiaries of ARISP-III have relatively better yield compared to non-beneficiaries. The increase in yield is important among poor farmers because this will be translated to increase in either cash income or consumption.

Close to half of the beneficiary farmers below poverty line (45%) obtained a yield ranging from 2.10 to 3.699 mt/ha (Table 80) while more than 60% of the non-beneficiaries reported the same range of rice yield. More beneficiaries below poverty line obtained a yield of more than 3.70 mt/ha.

Table 81 shows the comparison of gross income per hectare among relatively poor farmers. Consistent with previous findings results show that the ARISP-III project was able to significantly contribute to the increase in gross income among farmers. This increase in income was felt by poor farmers. It was observed that the gross income of rice farmers in Biliran and Southern Leyte recorded an increase of about PhP22,000 to PhP26,000 per ha per cropping season.

Table 80. Rice yield (mt/ha in intervals) per cropping season of farmers below the poverty line in Biliran and Southern Leyte

Yield	Beneficiary		Non-Beneficiary	
	No.	%	No.	%
below 2.100	25	26.88	6	21.43
2.100 – 3.699	42	45.16	18	64.29
3.700 – 5.299	16	17.20	4	14.29
5.300 – 6.899	6	6.45	-	-
above 6.900	4	4.30	-	-
Total	93	100	28	100

Table 81. Impact of ARISP-III on gross income (PhP/ha) per cropping season of farmers below the poverty line in Biliran and Southern Leyte

Gross Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	60,345.60	60,345.60	60,345.60
Non-beneficiary (PhP)	34,102.02	38,313.21	35,029.67
ATT (PhP/ha)	26,243.58***	22,032.39***	25,315.93***
Bootstrap SE[§]	5,826.77	4,900.95	5,612.94
z	4.50	4.50	4.51
P>|z|	0.000	0.000	0.000
Beneficiary (n)	93	93	93
Non-beneficiary (n)	28	28	28

Note: [§] Standard error was bootstrapped and replicated 50 times
*** p<0.01
Balancing property satisfied and common support imposed

Majority of non-beneficiaries (61%) and less than a third of beneficiaries (30%) below the poverty line obtained a gross income below PhP40,000 per ha. The other non-beneficiaries (39%) obtained a gross income between PhP40,000 to PhP69,999 per ha compared to a higher percentage of beneficiaries (42%). More than a fourth of beneficiaries (27%) realized more than PhP 70,000 gross income per ha (Table 82).

Table 82. Gross income (PhP/ha in intervals) per cropping season of farmers below the poverty line (in intervals) in Biliran and Southern Leyte

Gross Income	Beneficiary		Non-Beneficiary	
	No.	%	No.	%
Below 40,000	28	30.4	17	60.7
40,000 - 69,999	39	42.4	11	39.3
70,000 - 99,999	15	16.3	-	-
100,000 - 129,999	6	6.5	-	-
Above 130,000	4	4.4	-	-

Tables 79 and 81 highlight the impact of ARISP-III project among poor farmers. Results show that poor farmers are able to benefit from the improvement in the irrigation infrastructure as manifested by relatively higher production and gross income. This is as

expected because poor farmers are struggling with limited productivity, inconsistent supply, unfavourable prices and inability to access institutional markets (Centes *et al*., 2017). With limited asset and income, rice farmers who are below the poverty line were able to increase their production and gross income because of the interventions provided by ARISP-III.

However, taking into account the costs incurred in the production of palay, the poor farmers were found to be incurring losses (Table 83). The non-beneficiaries incurred higher losses (PhP 21,500 to PhP23,800) than the beneficiaries (PhP3,100) per ha per cropping season. The impact on net income showed mixed and inconsistent results. While nearest neighbour and kernel matching posted positive ATT values, the radius matching indicated a negative ATT. However, all values were not significant. This implies that the poor farmers were not able to statistically translate the increase in rice production to net income.

Table 83. Impact of ARISP-III on net income (PhP/ha) per cropping season of farmers below the poverty line in Biliran and Southern Leyte

Net Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	-3,135.81	-3,135.81	-3,135.81
Non-beneficiary (PhP)	-23,754.99	3,675.97	-21,513.36
ATT (PhPha)	20,619.18	-6,811.78	18,377.55
Bootstrap SE[§]	13,039.3	5,581.62	16,739.07
z	1.58	-1.22	1.10
P>|z|	0.114	0.222	0.272
Beneficiary (n)	28	28	28
Non-beneficiary (n)	93	93	93

Note: [§] Standard error was bootstrapped and replicated 50 times
Balancing property satisfied and common support imposed

Focusing the analysis during dry season only, Table 84 shows that poor farmer-beneficiaries incurred losses amounting to more than PhP200 per ha while their counterpart non-beneficiaries incurred losses to as high as PhP 41,000 to PhP 43,600 per ha. The ATT estimate for the impact analysis shows mixed results. The nearest neighbour and kernel matching show significant positive ATT values of at least PhP41,000. This is the difference in net income between the beneficiary and non-beneficiary. This implies that net income of poor farmers, though negative, have improved with ARISP-III. However, results of the radius matching show a negative ATT value and not significant result. The different results in Table 84 show that the impact of ARISP-III on the net income of farmers in Biliran and Southern Leyte during dry season is debatable. Meanwhile, Table 85 shows that the estimated impact on income above implicit costs of poor farmer-beneficiaries improves to PhP12,600 per ha. However, the ATT values are not consistent with Table 84. The nearest neighbour matching results to a positive ATT, but negative for radius and kernel matching. All values are not anymore statistically significant.

Table 84. Impact of ARISP-III on net income (PhP/ha) during dry season for farmers below the poverty line in Biliran and Southern Leyte

Net Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	-214.53	-214.53	-214.53
Non-beneficiary (PhP)	-43,619.59	3,086.89	-41,034.87
ATT (PhP/ha)	43,405.05**	-3,301.42	40,820.34*
Bootstrap SE[§]	21,364.39	6,598.786	23,033.31
z	2.03	-0.50	1.77
P>|z|	0.042	0.617	0.076
Beneficiary (n)	28	28	28
Non-beneficiary (n)	93	93	93

Note: [§] Standard error was bootstrapped and replicated 50 times
*** p<0.01, ** p<0.05, * p<0.1
Balancing property satisfied and common support imposed

4.5.1.5 Difference-in-Difference Analysis in Estimating Impact on Net Income

In the presence of good baseline data, DID is ideal in monitoring and documenting changes with time. However, upon checking with pertinent documents, baseline data was not available. So, the recall method was used in eliciting production input and output data *before* ARISP-III from randomly selected beneficiaries and non-beneficiaries included in the full survey.

Considering temporal effect, the method of DID was used to estimate the impact of ARISP-III on the net income of palay farmers. Table 86 shows the regression results using DID as an algebraic approach. This approach compares the difference in income *before* and *after* project intervention between the beneficiary group and non-beneficiary group following the same time line. It takes into account what would have happened to the profitability of the farmer-beneficiaries in the absence of the project.

Table 85. Impact of ARISP-III on net income above implicit cost (PhP/ha) during dry season for farmers below the poverty line in Biliran and Southern Leyte

Net Income	Nearest Neighbour	Radius Matching	Kernel Matching
ARISP-III beneficiary (PhP)	12,646.59	12,646.59	12,646.59
Non-beneficiary (PhP)	11,330.47	19,931.74	13,244.43
ATT (PhP/ha)	1,316.11	-7,285.16	-597.85
Bootstrap SE[§]	9,536.75	7,725.01	9,309.57
z	0.14	-0.94	-0.06
P>|z|	0.890	0.346	0.949
Beneficiary (n)	28	28	28
Non-beneficiary (n)	93	93	93

Note: [§] Standard error was bootstrapped and replicated 50 times
Balancing property satisfied and common support imposed

Table 86. Regression results on the impact of ARISP-III on net income and income above implicit cost of farmers

Variable	Dry Season		Wet Season		Combined	
	Net Income	Income Above Implicit Cost	Net Income	Income Above Implicit Cost	Net Income	Income Above Implicit Cost
Impact DID	14,786**	7,573	8,316	4,380	11,551**	5,977
	(6,185)	(5,336)	(5,103)	(4,961)	(5,142)	(4,791)
Beneficiaries	-11,461***	-8,739**	-4,551	-2,126	-8,006**	-5,432
	(4,374)	(3,773)	(3,608)	(3,508)	(3,636)	(3,388)
Period	-2,657	4,682	736.5	4,208	-960.2	4,445
	(4,651)	(4,013)	(3,838)	(3,731)	(3,867)	(3,603)
Constant	10,655***	16,890***	1,278	7,977***	5,966**	12,434***
	(3,289)	(2,838)	(2,714)	(2,638)	(2,734)	(2,548)
Observations	244	244	244	244	244	244
R-squared	0.043	0.066	0.030	0.033	0.042	0.053

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05

Results show that the impact variable for the DID is positive but only statistically significant on net income for dry season and combined (i. e., average of dry and wet cropping seasons). Estimates suggest that average net income during dry season significantly increased by about PhP14,800 per ha. Moreover, the average net income for both seasons significantly grew by approximately PhP11,600 per ha. The impact variable shows positive values suggesting that both net income and income above implicit costs of the beneficiaries fared well over time compared to the non-beneficiaries. This implies that the ARISP-III was able to contribute positively on the changes in net income of farmers over time.

Table 87 reflects the algebraic computation of the impact using DID approach per cropping season. Result shows that from a negative value of about PhP2,000 *before* ARISP-III, the net income of beneficiaries has grown to approximately PhP8,600 per ha *after* the intervention. This is comparably higher than the net income of non-beneficiaries. Likewise, the income above implicit costs of beneficiaries has grown from PhP7,000 to PhP17,400 per ha *after* the project. This is still higher than the income above implicit costs of non-beneficiaries. The DID computation for the net income is approximately PhP11,600 per ha while the income above implicit costs is about PhP6,000 per ha. Results in Table 87 reflect the analysis of the DID using regression approach in Table 86.

Table 87. Algebraic computation of the impact on income (peso/ha) per cropping season of beneficiaries and non-beneficiaries *before* and *after* ARISP-III in Biliran and Southern Leyte using difference-in-difference approach

	Net Income		Net Income Above Implicit Cost	
	Before	After	Before	After
Beneficiaries	-2,039.83	8,551.18	7,001.44	17,423.56
Non-beneficiaries	5,966.21	5,006.00	12,433.66	16,878.91
Difference-in-difference	11,551.22		5,976.87	

4.5.1.6 Estimating Effects on Technical Efficiency, Productivity and Income Among Beneficiaries *Before* and *After* ARISP-III

Both PSM and DID approaches measured the impact of ARISP-III by comparing the performance of beneficiaries and non-beneficiaries. These analytical tools showed evidence that indeed, the project has provided positive impacts in terms of productivity and income. However, it is also worthwhile looking at what happened over time to the beneficiaries. Their performance was measured *before* and *after* ARISP-III by comparing technical efficency, productivity and income using stochastic frontier production analysis, factor share analysis and t-test. Only data from beneficiaries who cultivated palay farms in both cropping seasons were considered in the analysis. With this, a little deviation in yield *after* ARISP-III can be observed compared to the results obtained using PSM. In order to eliminate the effects of inflation, the real net income and real income above implicit costs of beneficiaries over time were calculated using the producer price index of palay in Eastern Visayas during the apppropriate periods.

4.5.1.6.1 Technical Eficiency of the Sample Palay Farms

Table 88 presents the technical efficiency indices of irrigated palay farms *before* and *after* ARISP-III in Biliran and Southern Leyte. The observed mean technical efficiency index (TEI) *after* ARISP-III was 0.76. This is significantly higher than the mean TEI *before* ARISP-III. Moreover, the proportion of farmers with an efficiency index of at least 0.71 increased from 58% to 70% *after* availment of ARISP-III interventions. It must be noted however, that given the existing technology there is still higher potential for the output of palay farms to increase.

Technical efficiency was measured by estimating the frontier produciton function. Table 89 shows the maximum likelihod estimates for the parameters of the stochastic frontier production function and the inefficiency effects model.

Variables like number of trainings and involvement in ARISP-III had negative and significant coefficients while total farm area and membership in organizations had positive and significant coefficients. This means that farmers with more farming-related trainings who availed of ARISP-III interventions tend to be less technically inefficient. This can be attributed to the capability-building activities extended by both the INSTIDEV and AAD components. On the other hand, farmers who cultivated larger farm areas and were members of more organizations tend to be more inefficient. Cultivating larger farm areas devoted to varying crops require more time, rendering a farmer less

efficient. Moreover, membership in several organizations might have taken the farmer's time for his farm, making him less efficient. This result conforms to the findings of Bayacag *et al*. (2011) among mango farmers in Southern Mindanao.

Table 88. Distribution of palay farms by level of technical efficiency *before* and *after* availment of ARISP-III interventions in Biliran and Southern Leyte

Technical Efficiency Index	Before		After	
	No.	%	No.	%
0.50 and below	7	10.6	2	3.0
0.51 - 0.60	11	16.7	7	10.6
0.61 - 0.70	10	15.2	11	16.7
0.71 - 0.80	15	22.7	14	21.2
0.81 - 0.90	19	28.8	31	47.0
0.91 and above	4	6.1	1	1.5
Total	66	100.0	66	100.0
Mean[a]	0.70		0.76	

[a] The difference between the values *before* and *after* ARISP-III is significant at $\alpha = 0.01$

Results of the inefficiency effects model estimation showed a higher estimate of the variance parameter, gamma. This implies that the technical inefficiency effects were likely to be highly significant in the analysis of farm yields and hence, stochastic.

4.5.1.6.2 Productivity of the Sample Palay Farms

Differences in yields *before* and *after* ARISP-III per cropping season are shown in Table 90. The average yield of the irrigated palay farms significantly increased from 2.87 mt/ha to 3.09 mt/ha *after* ARISP-III. This conforms to FGD results and stories of most significant change narrated by the beneficiaries. According to the storytellers, their yields increased when the irrigation canals were cemented since there was already sufficient, if not abundant and continuous supply of water for their farms. Moreover, the proportion of farmers who were able to produce less than 1.70 mt/ha reduced from 20% to 14% while those who produced at least 3.20 mt/ha increased from 35% to 38%.

The signs of the coefficients of the input variables from stochastic fontier production function estimation exhibited the hypothesized positive input-output relationship (Table 89). Palay yield had significant relationship with amount of seeds, amount of hired, family and animal labor, machine use, type of production season, and variety of seed used. The productivity of palay farms increased with more amount of seeds used, man and animal labor, machine use, and use of hybrid seeds. Yield was also significantly higher during the dry season when factors such as day length or solar radation and temperature were optimum and the presence of water hastened the photosynthetic activity of the plants. This conforms to the findings of Gabunada *et al*. (2011) among rice farmers in Abuyog and Baybay, Leyte.

Table 89. Maximum likelihood estimates of the parameters of the stochastic frontier production function and technical inefficiency effects model for irrigated palay farms *before* and *after* farmers' availment of ARISP-III interventions in Biliran and Southern Leyte

Variable	Coefficient	Standard Error
Production Frontier Function		
Constant	7.3427***	0.2067
Seeds	0.0879*	0.04579
Nitrogen fertilizer	0.01175	0.0126
Herbicide	0.0054	0.0036
Insecticide	0.0032	0.0048
Hired labor	0.1312***	0.0357
Family labor	0.0153**	0.0064
Animal labor	0.0088*	0.0049
Machine use	0.0130***	0.0049
Season dummy	0.1455***	0.0510
Variety dummy	0.2137***	0.0830
Inefficiency Effects Model		
Constant	(5.8620)***	2.0709
Sex	(0.3940)	0.5486
Tenure	0.5309	0.4496
Farming experience	0.0005	0.0135
Total farm area	0.9637***	0.2694
Support from other agencies	(4.7745)	1.5185
Credit	(1.3343)	0.8311
Membership in organizations	0.7399**	0.2670
Training	(0.2184)**	0.0883
Membership in cooperative	1.1754	0.8550
Involvement in ARISP-III	(2.8723)***	0.9612
Variance Parameters		
Sigma squared	2.3465***	0.5393
Gamma	0.9658***	0.0102
Log likelihood	(161.51)	

Note: *** p<0.01, ** p<0.05, * p<0.1

Table 90. Distribution of palay farms by amount of yield *before* and *after* availment of ARISP-III services in Biliran and Southern Leyte

Yield (mt/ha)	Before ARISP-III		After ARISP-III	
	No.	%	No.	%
Below 1.70	13	19.7	9	13.6
1.70 – 3.19	30	45.5	32	48.5
3.20 – 4.69	19	28.8	16	24.2
4.70 – 6.99	4	6.1	9	13.6
Total	66	100.0	66	100.00
Mean[a]	2.87		3.09	

[a] The difference between the values *before* and *after* ARISP-III is significant at $\alpha = 0.05$

Although there was a significant increase in average yield *after* the ARISP-III interventions, the sample palay farms were still less productive considering both national and regional standards (Table 91). The ARISP-III aimed to increase palay productivity from 2.89 to 5.0 mt/ha eight years after project implementation. After more than three years of project implementation, the average yield of palay across project sites significantly increased from 2.87 to 3.09 mt/ha. However, the rate of increase in productivity is lower than the target. Yield can be further improved by increasing the technical efficiency of farmers and by promoting the use of hybrid palay seeds.

Table 91. Comparison of sample palay farms' average yield (mt/ha) with the national and regional averages *before* and *after* ARISP-III interventions

Item	Before (2009)	After (2017)	Difference
Philippine average yield	3.95	4.42	0.47
Eastern Visayas'average yield	3.49	4.25	0.76
Sample farms' average yield	2.87	3.09	0.22
Ratio			
Sample average to national average	0.73	0.70	(0.03)
Sample average to regional average	0.32	0.73	0.41

4.5.1.6.3 Farm Income of the Sample Palay Farmers

Similar to yield, real net income and real income above implicit costs significantly increased per cropping season *after* ARISP-III interventions (Table 92). This means that palay production over time became more profitable among beneficiaries. Likewise, this confirmed the stories of most significant change experienced by the beneficiaries *after* the improvement of their irrigation systems. They related that due to sufficient irrigation water, they were able to get good harvest, the excess of which were sold providing them additional cash income. Others claimed that with the availability of abundant irrigation water, they were able to plant palay instead of corn or root crops that generated higher income for them.

Table 92. Yield (kg/ha) and income (PhP/ha) of beneficiaries per cropping season *before* and *after* ARISP-III in Biliran and Southern Leyte

Variable	Before	After	Difference
Yield	2,874.15	3,090.60	216.45**
Real net income	-1,410.88	5,381.82	6,792.70***
Real income above implicit costs	5,175.16	10,406.07	5,230.91***

Note: *** p<0.01, ** p<0.05

Table 93 presents the costs of factor inputs and the total value of output in palay production *before* and *after* availment of ARISP-III interventions. Results show that the total value of output significantly increased by 14% while the total costs of factor inputs decreased by about 10%. This brings about a significant reduction in the factor share of all inputs from 105% to 83%. Having produced more output at a lower cost, the farmer-

beneficiaries became more cost-efficient. Thus, real net income significantly increased by more than 480%.

Table 93. Factor payments (with values in real terms) and shares in palay production *before* and *after* availment of ARISP-III interventions in Biliran and Southern Leyte

Variable	Before ARISP-III		After ARISP-III	
	Factor Payment (₱/ ha)	Factor Share (%)	Factor Payment (₱/ ha)	Factor Share (%)
Total Output	28,103.62	100.00	32,023.70	100.00
Current Inputs	11,211.46	39.89	8,260.47	25.79
Seeds	828.89	2.95	888.95	2.78
Fertilizer	5,250.41	18.68	4,623.45	14.44
Chemicals	983.90	3.50	882.90	2.76
Others	4,148.26	14.76	1,865.17	5.82
Labor Inputs	15,518.13	55.22	14,126.16	44.11
Family	6,324.32	22.50	4,708.79	14.70
Hired	9,193.81	32.71	9,417.37	29.41
Capital Inputs	2,784.91	9.91	4,255.26	13.29
Animal	1,155.35	4.11	1,825.35	5.70
Owned	235.05	0.84	268.92	0.84
Hired	920.31	3.27	1,556.44	4.86
Machine	1,629.55	5.80	2,429.91	7.59
Owned	26.67	0.09	46.55	0.15
Hired	1,602.88	5.70	2,383.36	7.44
Total Inputs	29,514.50	105.02	26,641.89	83.19
Income Above Implicit Costs[b]	5,175.16	18.41	10,406.07	32.49
Net Income[b]	-1,410.88	-5.02	5,381.82	16.81

[b] The difference between the values *before* and *after* ARISP-III is significant at $\alpha = 0.01$

As a development project, the ARISP-III has improved the productivity of palay farms and profitability of farmer-beneficiaries over time. This finding is similar to the impact of the Techno Gabay Program (TGP), a program for technology dissemination and utilization of the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (DOST) among palay farmers in selected municipalities of Eastern Visayas (Gabunada *et al*., 2011), Western Mindanao (Narvaez and Narvaez, 2011), Central Luzon (Aveno *et al*., 2011), and Ilocos Region (Alimbuyuguen and Julian, 2011).

4.5.1.7 Improvement in the Financial Performance and Status of Primary Cooperatives

Aside from improvement in palay yield and income of its beneficiaries, the ARISP-III also helped improve the financial performance and status of the primary cooperatives it supported. The impact of interventions in the organization and management, production and marketing activities of said ARCOs were reflected in their financial performance and status. Table 94 contains the revenue, profit, amount of external funds accessed, members savings, Capital Build Up and total equity of ARCOs *before* and *after* ARISP-III. However, for some cooperatives, data gathered were limited only to the period after the implementation of the project. Some of them were not yet registered before the project and although they were engaged in livelihood activities financial reports were informal and unaudited. Some of these reports were no longer available during the conduct of the impact assessment. Natural calamities such as strong typhoons that visited the study sites, turn over of officers and transfer in office location of coordinating agencies have caused inaccessibility of past data.

The financial performance and status of the primary cooperatives *before* and *after* ARISPIII were assessed using some financial indicators. The average peso amount of revenue, net surplus (net income) generated and amount of funds accessed other than that of ARISP-III were used as measures of performance while the amount of Capital Build Up (CBU) as well as Equity and Savings were used as measures of financial status. Table 94 shows that of all the primary cooperatives, only KARBC in Southern Leyte has *before* and *after* data on Revenue and Net Surplus which both increased significantly from 2011 to 2015. KARBC, however, was no longer into productive activities as of 2018 due to some management problems.

BARC. The Balaquid Agrarian Reform Cooperative in Biliran was the most productive among the primary cooperatives assessed as shown by the number of thriving livelihood enterprises *before* and *after* the project. From 2009 to 2011, BARC generated an average annual revenue of PhP183,636.18 and average annual net surplus of PhP51,048. The average annual total equity of the cooperative has amounted to PhP166,848. Its average annual revenue from 2012 to 2018 has increased by 109% from PhP183,636 to PhP384,151. Likewise, its net surplus increased by 170% from PhP51,048 to PhP138,031 which resulted to a 937% increase in its total equity.

The improved financial performance and status of BARC is a clear manifestation of how ARISP-III was able to help the cooperative improve its organization, production, marketing and financial practices. As of the impact asseesment period, BARC has diversified its livelihood activities with the additional financial assistance from PRDP.

The PHF provided BARC the opportunity to grow its palay trading business. Having a storage warehouse and solar dryer, the cooperative doubled the volume of palay traded (from 1,000 to 2,000 sacks per year). *Before* ARISP-III, palay purchased by the cooperative was dried along the highway/road side. Since the cooperative does not have a storage facility, it had the tendency to sell palay almost immediately or if needed, storage of palay was done in the respective houses of members.

Table 94. Selected financial performance indicators of the primary cooperatives in Biliran and Southern Leyte *before* and *after* the implementation of ARISP-III

Financial Indicator	Before	After
Biliran		
AARCO		
Revenue	No available data	No available data
Net surplus	No available data	No available data
Capital Build Up	No available data	362,872.00
Equity	300,000.00	362,872.00
Savings	None	With savings (ASEMCO & LBP)
External funds accessed	None	1,000,000 (APCP)
BARC		
Revenue	183,636.18	384,150.73
Net surplus	51,048.29	138,030.96
Capital Build Up	63,000.00	242,098.00
Equity	166,848.08	1,728,106.52
Savings	With savings	With savings
External funds accessed	103,400.00 (PEF)	1,500,000 (APCP) 3,000,000 (PRDP)
Southern Leyte		
KARBC		
Revenue	3,794.30	73,859.83
Net surplus	(734.95)	43,045.48
Capital Build Up	28,300	60,479.67
Equity	28,632.00	61,826.98
Savings	With savings	With savings (20,000+ as of 2018)
External funds accessed	None	None
HARC		
Revenue	No available data	277,184.97
Net surplus	No available data	70,487.42
Capital Build Up	41,717.00	306,290.00
Equity	No available data	746,997.43
Savings	With savings	With savings (215,516.62 as of 2018)
External funds accessed	None	DA funds for farm inputs loaned to members
SARABCO		
Revenue	No available data	92,762.03
Net surplus	No available data	27,864.67
Capital Build Up	42,378.29	98,884.00
Equity	No available data	No available data
Savings	With savings	With savings
External funds accessed	64,595.50	No available data

With the PHF, palay drying and storage became more convenient. Moreover, the storage warehouse and solar dryer has reduced storage and drying losses by 0.27% and 0.2%, respectively. The storage warehouse also served as evacuation center to about 80 households during calamities (e. g. Typhoons Ruby and Urduja). It provided office space for the cooperative and further served as venue for trainings and seminars as well as pickle processing. On the other hand, the solar dryer provided space for functions like wedding and birthday parties for a fee.

During the validation meeting towards the end of the impact evaluation, the officers of BARC revealed that their palay trading business has been adversely affected by the Rice Tarrification Law. The volume of palay traded had greatly reduced because traders purchased their palay at very low price due to availability of cheaper imported rice.

KARBC. The Katipunan Agrarian Reform Beneficiaries' Cooperative in Silago also showed improved financial performance from 2011 to 2015. Its average annual revenue increased by 188% from PhP3,794 to PhP73,860; net surplus by 596%, that is from (PhP735) to PhP43,045. Moreover, its Capital Build Up increased by 113% from PhP28,300 to PhP60,480. With a highly profitable operation and increased CBU, the equity of the cooperative also increased by 116%, from PhP28,632 to PhP61,827. The improved financial performance of KARB also shows how the ARISP-III intervention had helped it grow. However, as mentioned earlier in this report, KARB has encountered some financial problems including mounting receivables that has made the cooperative inactive and unable to meet legal requirements to secure renewal of registration. The cooperative members expressed their need for officers with integrity and commitment that can help revive the cooperative's operations. Periodic monitoring, problem assessment and corrective actions are needed to revive and sustain the cooperative's operations.

HARC. The Hingatungan Agrarian Reform Cooperative is another primary cooperative which has been very productive *before* and *after* ARISP-III. However, only financial reports during and after ARISP-III were available during the conduct of the impact assessment. Financial data gathered from 2017 to 2018 revealed that the cooperative generated an average annual revenue of PhP277,185, average annual net surplus of PhP70,487 and an average equity of PhP746,997. Computed values of these three financial indicators showed increasing trend within the said period. This can be attributed to increased number of enterprises and intensity of operations brought about by ARISP-III's financial and technical assistance, among others. However, continual monitoring and assessment are needed for the sustainability of its operations.

AARCO and SARABCO. Although AARCO in Biliran and SARABCO in Southern Leyte have been denied registration for the past 2 to 3 years due to failure to submit required documents, they were still actively engaged in productive activities but have divested some of their business. AARCO is one of the recipients of PRDP funds used for the production of broiler, APCP for its agri-production loan, DAR for vegetable production and DA for animal production. The cooperative planned to changed its name and apply for re-registration with DOLE. Financial reports of AARCO *before* ARISP-III were not available because the new set of officers were not members of the cooperative *before* the project. No financial reports were turned over to them when they assumed office. SARABCO, on the other hand, was still into production of banana but only with

the active involvement of some of the members of the BOD. Some of the members of the cooperative attended training on coconut wine production and planned to venture into this enterprise as they found it to be promising due to the abundance of coconut in the area. The cooperative was newly organized and registered during ARISP-III hence it does not have past records. AARCO and SARABCO both need immediate and direct intervention from DAR for revival and growth.

Data on the percent increase in CBU by all primary cooperatives except AARCO demonstrate an improvement in financial status. The presence of savings deposits (although the amount was not disclosed by the majority), and significant amount of equity also demonstrate good financial status of the primary cooperatives despite failure to renew registration with CDA. These demonstrates that overall, ARISP-III was able to achieve its goal of increasing the financial performance and status of most primary cooperatives. To sustain their operations, there is an urgent need for intervention from concerned government agencies especially for cooperatives that are already inactive.

4.5.2 Social Impact

Aside from economic impact, ARISP-III also generated social impacts. The INSTIDEV component resulted to active involvement and improved patronage of members to their respective ARBOs. Moreover, the irrigation facilities resulted to reduction in conflict on the use of irrigation water. Aside from improving the efficiency of commodity flow, the farm-to-market roads improved the mobility of people in the project sites and provided access to services and other opportunities.

4.5.2.1 Increased Members' Patronage

Better management practices can result to higher integrity of the officers and higher confidence of the members to the management capability of the officers and the organization as a whole. This in turn results to the increase in the participation and involvement of the members to the organization activities and patronage to the products and services of their respective organizations.

The number of actively involved members in the ARBOs across sites exceeded its target (Table 95). The primary cooperatives' actively involved members have increased by 73% while the water users' associations membership rose by 34% above the target. The increase in involvement and patronage of members to their respective ARBOs was a manifestation of the stronger leadership and management that attracted more people to become members.

4.5.2.2 Reduction of Conflict on the Use of Irrigation Water

Historically, the common problem in the use of communal irrigation systems has been the conflict in water distribution including the usage schedule. With the Organizational Structure, Constitution and By-Laws, PSPs and Operation Manual prepared and manualized, this problem, which sometimes led to conflict among association members, was significantly lessened. The MSC stories related that when the

respective irrigation systems were rehabilitated, water became more abundant and continuously available so it could be evenly distributed to the rice farmers. Because of this, farmers were not anymore quarelling over water. Despite the existence of some minor disagreements, the incidence of conflict among members was eliminated and has brought peaceful and harmonious co-existence among the IA members.

Table 95. Target and actual number of patronizing members of ARBOs in Biliran and Southern Leyte

Type of ARBO	No. of Actively Involved Members		Percentage Increase
	Target	Actual	
Primary Cooperatives	319	552	73%
Irrigators' Associations	360	360	-
Water Users' Associations	1,547	2,078	34%
Total	2,226	2,990	34%

4.5.2.3 Improved Efficiency of Commodity Flow and Mobility of People

The farm-to-market road (FMR) project improved transportation across sites. Better roads facilitated the availability of motorized vehicles. This significantly reduced travel time of people and allowed faster as well as more efficient transport of goods. Moreover, the FMR project significantly increased mobility of people within the ARCs.

4.5.2.4 Better Access to Services and Opportunities

Apart from increasing efficiency of commodity flow and mobility of people, better roads have opened opportunities to access to advanced transportation facilities, additional enterprises as well as food and health security, among others.

Better roads have increased the availability of motorized vehicles (commercial and privately owned by households) plying to and from the project sites, making transportation smoother and faster. A more convenient flow of goods and people has resulted to increased business enterprises like sari-sari stores, bakery, copra trading, *etc.* which provided additional livelihood opportunities. Moreover, the FMR project has offered opportunity for better access to medical care.

In the case of San Ricardo in Southern Leyte, for instance, prior to the construction of the FMR, the residents from Brgy. Looc revealed that they primarily used banca as means of transportation in going to Brgy. Pinut-an where transportation facilities that would connect them to the town proper are available. However, unfavourable weather conditions usually prevented them from travelling. This also hindered them from availing their needed goods and services. Before, they experienced hunger due to unavailable supplies of basic commodities like rice. Worse, some patients have been deprived of medical care that resulted to death. The situation has now improved because the stores in the area are now able to continuously supply the basic needs of people. Much more, sick people are also given timely medical attention with available transportation facilities.

Apart from these, the FMR projects also facilitated the establishment of more permanent structures like houses and other facilities as hauling/transportation of construction materials became more convenient. People across project sites also observed that with FMR, valuation of land in the areas generally increased. In Brgy. Kasabangan, Cabucgayan, Biliran the FMR project was considered a boost to the eco-tourism development of the Kasabangan Falls; this was an unintended impact of the project. Over time, the number of tourists to the Kasabangan Falls increased (Figure 13). The local management of the tourist area attributes this influx of tourists to the construction of the FMR. This has not only generated additional income to the local economy but has also hastened the promotion of the tourist spot.

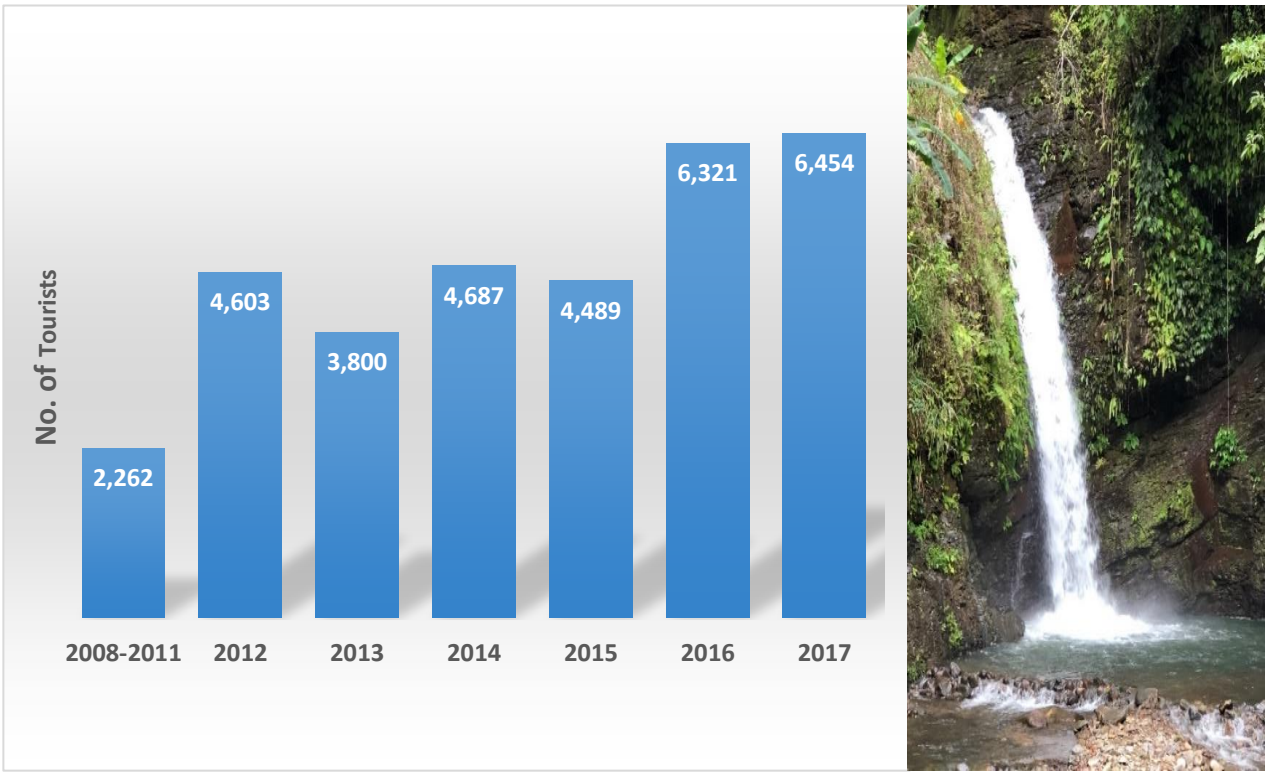


Figure 13. Number of tourists to the Kasabangan Falls in Cabucgayan, Biliran from 2008 to 2017

4.5.3 Environmental Impact

The potable water system (PWS) project increased the availability of piped water supply in the project sites. Aside from significantly reducing travel time to fetch water, the project has reduced the dependence on spring and well as other sources of drinking water. The PWS project provided access to and availability of potable water to the beneficiaries.

4.5.4 Impact of ARISP-III as Revealed by the Beneficiaries' Stories of Significant Change

To supplement the quantitative data on the impacts of ARISP-III, qualitative indicators were also determined using the stories of significant change narrated by the project beneficiaries. The stories were gathered by the projects' science research assistants and enumerators from the program beneficiaries who were randomly chosen to become respondents of the impact assessment survey. Story collection was done through interviews with the selected respondents.

A total of 174 stories (Table 96) were collected from the beneficiaries in the areas in Biliran and Southern Leyte provinces where the ARISP-III was implemented. More than half of the stories (55%) came from Biliran, and the remaining 45% came from Southern Leyte.

As previously mentioned, the ARISP-III implemented in the two provinces had several components. These components include: (1) provision of basic infrastructure (e.g. irrigation, post-harvest facilities, farm-to-market road, and potable water system); (2) institutional development/organizational support and enabling technologies; and (3) agriculture and agribusiness enterprise. The respondents of this study were involved in any or a combination of project components, but the most significant changes reported were only those related to the Improvement of the Irrigation System (76%), Institutional Development (13%), Farm-to-Market Road (10%), and Potable Water System (1%) (Table 96).

Table 96. Distribution of significant change stories by province and ARISP-III component projects

Project Component	Province		Total	Percent
	Biliran	Southern Leyte		
Irrigation	72	61	133	76.4
Institutional Development	15	7	22	12.6
Farm to Market Road	9	8	17	9.8
Potable Water System	-	2	2	1.2
Total	96	78	174	100.0
Percent	55.2	44.8	100.0	

4.5.4.1 Changes Experienced by the Beneficiaries of the Communal Irrigation System/Project

The Irrigation Project component focused on the construction of new irrigation system, or repair of existing irrigation system (dam construction or rehabilitation and cementing of irrigation canals) in the selected project sites. In Biliran, the impact evaluation surveys and gathering of MSC stories were conducted in the towns of Almeria (Upper and Lower Iyusan, Tamarindo, and Sampao) and Cabucgayan (Balaquid, Magbangon, and Basud). In Southern Leyte, gathering of MSC stories were done in

barangays Hingatungan and Katipunan in the town of Silago, and in barangay Bagacay in Abuyog, Leyte where some members of the Katipunan Irrigation Association were living. To determine the range of changes experienced by the beneficiaries of the Irrigation Project, the collected stories were grouped into domains or broad categories of change.

Results of the broad categorization revealed that the stories of change told by the beneficiaries of the Irrigation Project belonged to five (5) domains, namely: (1) changes in knowledge, attitude and skills, (2) changes in practice and product or irrigation service quality, (3) economic changes, (4) social changes, and (5) other changes (no significant change, negative changes, and others). The highest number of stories was about economic changes (49%), followed by social changes (26%), changes in practice and product or irrigation service quality (16%), other changes (9%), and changes in knowledge, attitude and skills (1%) (Table 97).

To understand the kinds of change under each domain or category of change, the stories were subjected to thematic analysis. Moreover, to determine if the irrigation project had really made an impact on the beneficiaries, the themes of changes were further classified based on Bennett's Hierarchy of Program Outcomes.

Table 97. Distribution of significant change stories about outcomes of ARISP-III per province and domain of change

Domain of Change	Province		Total	Percent
	Biliran	So. Leyte		
1. Changes in knowledge, attitude and skills	1	-	1	0.8
2. Changes in practices and product or service quality	13	8	21	15.8
3. Economic changes	40	25	65	48.9
4. Social changes	11	24	35	26.3
5. Other changes (improved attitude towards ARISP-III, no significant change, negative change)	7	4	11	8.3
Total	72	61	133	100

4.5.4.1.1 Changes in Knowledge, Attitude and Skills

There was only one story under this domain (Table 98). This was about an increase in knowledge on proper irrigation of rice paddies, which was narrated by a beneficiary from barangay Iyusan, Almeria, Biliran. He narrated that because of the trainings about irrigation, he gained more knowledge on the correct amount of water to apply in a rice paddy. He said this change was important because the application of the appropriate amount of water in his rice farms can result in the improvement of the quality of rice harvest. He narrated:

Kaning mga training sa irigasyon kay nakahatag kini nako og kaalam nga usa sa pinaka importante og magbasak ka, ang sakto nga irigasyon. Kay ang sakto nga

irigasyon maghatag og maayong kalidad sa humay. (The trainings on irrigation gave me knowledge that correct irrigation practice is very important when you are farming rice. It is because correct irrigation can lead to good quality rice.) [Story No. B-1]

Table 98. Theme of change of the MSC stories under Domain 1 (changes in knowledge, attitude and skills)

Theme of Change	Description	Reason for considering the change important	Project Site	Number of Stories
Increase in knowledge about proper irrigation	The storyteller said that through the trainings on irrigation, he learned about proper irrigation of rice farms.	Correct irrigation can lead to good quality rice.	Biliran (Iyusan, Almeria)	1

4.5.4.1.2 Changes in Practice and Product/Service Quality

There were 21 stories under this domain (Table 99). These stories represented four themes of change, namely: (1) improved irrigation services (57%), (2) increase in cropping frequency (24%), (3) change in farming practices (10%), and improved rice growth (10%).

Improved Irrigation Services. The 11 stories about improved irrigation services were generally telling about the improvements in the irrigation services which the IA members experienced in the form of continuous flow of water in the cemented irrigation canals, abundant water, water being always available, as well as irrigation canals being sturdy and do not need frequent repair or cleaning. To them, this kind of change is very important because the improved irrigation services would enable them to plant continuously and would even allow them to get good yield. It can also lessen their burden of cleaning the canals frequently and in checking their rice fields for the availability of water. According to a farmer from barangay Iyusan in Almeria, Biliran:

Sukad nga napasemento na ang pal- og, mao jud kini ang pinaka importanteng kausaban nga nasinati nako gikan sa ARISP-III. Tungod ani, di na ko mamroblema sa daganan sa tubig, unya kung mo bagyo, ila siguraduhon nga maayad ang pal-og kung naguba man. Makatanom nako kung kanus-a nako gusto. Importante kini kanako kay pinaagi ani dili na babag og mag huwaw kay abunda ang tubig nga magamit nga dako pa og tabang para masustentohan ang maayong pagtubo sa humay nga mas mapadaghan ang abot ug madugangan ang among pangunsumo. (Since the irrigation canal was cemented, this was the most important change that I have experienced because of ARISP-III. Because of this, I don't have a problem with [irrigation] water, and when there is typhoon, they make sure that the canal would be repaired when it is destroyed. I can now plant rice whenever I want to. This is important to me since through this, drought won't be a hindrance [to my farming] anymore because there is now abundant water that we can use, which is a big help to sustain good growth of rice resulting to higher yield and additional food for consumption.) [Story No. B-5]

Table 99. Themes of change of the MSC stories under Domain 2 (changes in practices and product or service quality)

Theme of Change	Description	Reasons for Considering the Change Important	Number of Stories		Total	Percent
			Biliran	So. Leyte		
Improved irrigation services	According to the story tellers, the most important change for them is that the irrigation project has been able to provide them with improved irrigation services, which they described in terms of continuous flow of water in the cemented irrigation canals, abundant water, water being always available, irrigation canals being sturdy and do not need frequent repairs or cleaning.	There were several reasons that were given for considering the changes as important. These include: (1) good supply of water can result to good yield, (2) continuous supply of water allows them to plant continuously, and it lessened their burden because they need not keep on checking if there is water in their paddies; (3) the cemented canals need lesser repair and cleaning; and (4) availability of water is important because they got their livelihood from their rice farms.	7	5	12	57.14
Increase in cropping frequency	According to the story tellers, the most important change that they have experienced is that the improved irrigation system enabled them to plant rice continuously. They can now plant twice a year, unlike before when they could only plant during rainy season.	They said this change is important because the increase in their frequency of planting enabled them to earn more income which they were able to use for the education of their children, and to defray daily household expenses	5	-	5	23.81
Change in farming practice	One story teller said that because of the improved irrigation system, they were able to plant hybrid rice variety, while the other story teller said, they were able to convert part of their coconut area to rice farm.	According to one story teller, the change is important because hybrid variety yields higher than inbred, so it could give them higher yield and income. On the other hand, the other story teller said the conversion of their coconut area into rice field was able to help their workers earn more income from the harvested rice.	1	1	2	9.52
Improved rice growth	The story tellers said that when the irrigation canals were rehabilitated, water flow was already better and so their rice plants were able to grow better than before.	They said this change is important because with enough supply of water, rice plants are able to grow well.	-	2	2	9.52
Total			13	8	21	100

Also, according to a farmer from barangay Bagacay in Abuyog, Leyte, who is tilling a rice field in Katipunan, Silago, Southern Leyte:

Maajo ang irigasyon kay wala na mi maproblema sa tubig kay sila may magpatubig. Mo ingon ra mi nga wala na mi tubig, paagasan dajon mi nila. Ug mas sajon ang pag-agi sa tubig kay sementado naman. Lahi ra sa una nga manga guba dayon ang kanal. *Importante kay makatanom naman mi og tarong kay naa namay supply nga sakto sa tubig*. (Irrigation is good because we don't have problems about water anymore because they take charge in irrigating our fields. We just tell them that we don't have water anymore, and they would immediately provide water to our farm. The water can now easily flow to our farms because the canals are now cemented. It's different in the past when the canals would easily be destroyed. It is important because we can already plant on time since we already have enough supply of water.) [Story No. SL-4]

Increase in Cropping Frequency. There were six stories telling about this kind of change. All of these had been narrated by rice farmers from Biliran Province. Generally, the story tellers were saying that the most important change they have experienced was that the improved irrigation system enabled them to plant rice continuously. Specifically, they said that they can now plant twice a year, unlike before when they could only plant during rainy season. They considered this change as important because the increase in their frequency of planting enabled them to earn more income which they were able to use for the education of their children, and to defray for their daily household expenses. According to a farmer from barangay Balaquid in Cabucgayan, Biliran:

Nakatabang ang irrigation tungod kay ang among kanal dili na man mahubsan og tubig, permanente na man dili na parehas sa una. Tungod kay permanente man ang tubig sa irigasyon, ***makatanom na mi og kaduha sa usa ka tuig*** *dili na pareha sa uban nga makatanom ra kun ting- uwan kay wala man silay tubig.* (The irrigation project is a big help because the canal won't run out of water anymore, water is already permanently available, unlike before. Since water is already permanently available in our irrigation system, we can already plant rice twice a year unlike others who can only plant during rainy season because this is the only time when they have water.) [Story No. B-6]

Also, according to a farmer from barangay Tamarindo in Almeria, Biliran:

Ang irigasyon. Kay sa una ang among pal-og naguba. Tungod nga na-miyembro ko sa IA, na-ayo ang among irigasyon unya ***nakatanom na mi og tarong unya kaduha na mi makatanom sa usa ka tuig***. *Importante ni namo tungod kay maayo na ang resulta sa among pananom. Kusog na ang tubig nga maka-sustain na sa among pag-uma. Og tungod ani, dili na mi mag ilugay og tubig ug nidako ang abot sa among basak*. (Irrigation. Because before, our irrigation canal was destroyed. When I became a member of the IA, our irrigation system was repaired so we were able to plant rice twice a year. This is important for us because rice farming now has good results. We already have adequate water to sustain our farms. And because of this, we do not anymore fight over water and the yield of our rice farms have increased.) [Story No. B-13]

Change in Farming Practice. There were two stories in this theme. One was narrated by a farmer from Biliran, and the other was narrated by a farmer from Southern Leyte. According to a farmer from Barangay Balaquid in Cabucgayan,

Biliran, because of the irrigation, they were able to convert a portion of their coconut area into a rice field. She said:

Ang irigasyon. Kay ang among kayuta-an sa una puros ra lubi unya pagka-miyembro na nako sa IA, ¾ sa amo area, amo gipaputol ang mga lubi unya amo sad gi donate ang mga lubi sa umaabot nga construction para sa library sa elementary. Og mao kini ang amo gihimo nga humayan…. Nakatabang usab ang among humayan sa mga tawo nga nanabang sa pag-atiman og pag-ani sa akong basakan tungod sa dako nga abot. (The irrigation project. Our land before was all planted to coconuts. When we became members of the IA, we cut the coconut trees in about ¾ of our area and we donated it for the construction of the library of the elementary school. This is the area that we converted into a rice field…. Our rice field was also able to help the people who helped in taking care of our rice farm because we were able to get high yield.) [Story No. B-8]

On the other hand, a farmer from Katipunan, Silago shared that the most important change that he experienced because of the irrigation project was when they were able to plant hybrid rice variety due to abundant water supply. He said:

Dakog kausaban kay tungod sa ARISP-III, ***nakatanom na mi og hybrid nga binhi****, gihatagan mi og importansiya sa gobyerno pinaagi ani nga project. Sa una wala pa ang project, puro lang inbred ang itanom. Importante kay dako man og abot ang hybrid kaysa sa inbred nga binhi. Maong mas modako pod ang among kita kay daghan man pod og abot.* (There was a big change because since the implementation of ARISP-III, we were able to plant hybrid variety; we were given importance by the government through this project. In the past, when the project was not yet there, we were able to plant inbred varieties only. It is important because hybrids have higher yield than inbred, that is why we also have bigger income because we have high yield.) [Story No. SL-7]

Improved Rice Growth. Only two stories represented this kind of change, and these were narrated by farmers from Southern Leyte. They said that when the irrigation water became available always, their rice plants grew well. For instance, according to a farmer from Hingatungan, Silago:

Importante para nako ang pag konkreto sa among kanal para sa irigasyon kay natabangan mig dako ani sa among pagpanguma. Importante ni nga kabag-ohan kay na ***nindot na ang tubo sa humay*** *hangtod sa pag ani nako. Dili na magkuwang sa tubig.* (Concreting of our irrigation canals is important for me because it has helped us a lot in our farming. This change is important because our rice plants are now growing well until harvest. We do not lack water anymore.) (Story No. SL-8]

4.5.4.1.3 Economic Changes

There were 65 stories under this domain (Table 100). These stories constitute nearly half (48%) of the 135 MSC stories about changes experienced by the beneficiaries of the irrigation project. These stories represent six kinds of change, namely: increase in yield (23 stories), increase in income (18 stories), increase in food availability (15 stories), improved living conditions (6 stories), improved livelihood (2 stories), and better-quality rice (1 story).

Table 100. Themes of change of the MSC stories under Domain 3 (economic changes)

Theme of Change	Number of Stories		Total	Percent
	Biliran	So. Leyte		
Increase in yield	14	9	23	35.4
Increase in income	11	7	18	27.7
Increase in food availability	7	8	15	23.1
Improved living condition	5	1	6	9.2
Improved livelihood	2	-	2	3.1
Better quality of rice	1	-	1	1.5
Total	40	15	65	100

Increase in Yield. There were 23 MSC stories with this theme (Table 101). Fourteen (61%) came from Biliran, and nine (39%) came from Southern Leyte. Generally, these stories narrated that because of the improved irrigation system (*i.e*. cemented canals) which made irrigation water sufficient for their farms, their rice yields also increased. To the story tellers, this kind of change was important because it provided them with enough food and even more income which they can use for their daily expenses.

Below are some examples of the stories about increase in yield due to the improved irrigation system. According to a farmer from Magbangon, Cabucgayan, Biliran:

Sa wala pa na semento nang among kanal sa basakan, mo abot lang mi og mga 30 ka sako pero tungod sa proyekto sa NIA, na sementohan ang kanal sa ubang basakan ug apil na ang ako, ug naka abot na akong ani og 50 ka sako. *Importante ni kay bisan damo mi nga nagpuyo diring balaya, ang among pang konsumo mi sobra na kini ug dakong kalipay nako sa nahitabo.* (Before the irrigation canals were cemented, we can only harvest up to 30 sacks, but when the canals were cemented, we were able to harvest up to 50 sacks. This is important because even if we are many who are living in this house, we already have more than enough rice for home consumption and I am so happy of what happened.) [Story No. B-41]

Table 101. Description of the MSC stories about increase in yield

Theme of Change	Description	Reasons for Considering the Change Important	Sites	No. of Stories
Increase in yield	According to the story tellers, they got higher rice yield when the irrigation canals were cemented since there was already sufficient, if not abundant and continuous supply of water for their farms.	They were assured of their food; some were even able to sell the extra harvest and earn income which they used to defray daily household expenses	Biliran Southern Leyte	14 9

Also, according to a farmer from Hingatungan, Silago:

Tungod sa tubig, mi taas gamay amo abot ug natilok amo basakan ug tanom kay matubigan na ang kilid kilid sa basakan. *Mas damo nakoy ma baligya tungod sa tubig nga maayo*. (Because of the water, our yield increased a little bit; we were able to plant all portions of our rice field because of the water availability. I was able to produce and sell more paddy rice from our farm.) [Story No. SL-13]

Increase in Income. There were 18 stories about this kind of change (Table 102). Eleven came from Biliran and seven (7) were from Southern Leyte. Based on the stories narrated by the project beneficiaries, there were at least five types of experiences related to the improved irrigation system that lead to increase in income. The most common were stories on how the sufficient irrigation water provided through the improved irrigation system enabled the farmers to get good harvest, the excess of which were sold, resulting to increase in income. For instance, according to a farmer from Magbangon, Cabucgayan, Biliran:

Ang cropping season year-round na, diri lang rainfed. Nakadugang han amon abot kay times two na gad. Increased harvest means ***increased yield which results to increased income*** *para namo. Amo na kini an ako pinagkaka-abalahan karon na retired na kami ng asawa ko. Tungod nitaas na ang abot, nakapagaling na mi og daghan, mas natabangan sad namo an amon mga silingan kay bugas na man an amon ginbaligya*. *Accessible para sa kadaghanan. Naa gihapon mi kapuslanan sa ako asawa kay nakatabang mi nila.* (Our rice cropping season is already twice a year, not just once. Our harvest has increased because we can plant two times a year now. Increased harvest means increased yield which results to increased income for us. Rice farming is occupying our time now that my wife and I are already retired. Since our yield has increased, we are able to mill more rice, and we are able to help our neighbors because we are now selling milled rice, making it accessible to more people. In this way, me and my wife feel that we are still useful because we are able to help other people.) [Story No. B-33]

A farmer from Hingatungan, Silago, Southern Leyte also shared:

Sa una, ang tubig kay arang ka hinay kaajo. Unya pag abot sa proyekto, kay ilaha man gi rehab ang mga kanal, mi bentaha na ang tubig sa among basakan. Tungod sa pag improve sa tubig, nakabaligya ko og ginagmay. *Mitaas gamay ako abot paghuman sa rehab ug* ***nakatabang sad ang akong ginagmay nga pagpamaligya sa akong pamilya kay naa na mi ma income para sa mga bayronon sa akong mga bata*****.** (Before, the water flow was very slow. When the project came, they rehabilitated the canals and the water flow to our farms has improved. Due to the improvement in water availability, I was able to sell some [of my rice harvest]. My harvest improved a little bit after the canals were rehabilitated, and the sale of some portion of my harvest was able to help my family because we already have income which we used to defray expenses for the education of my children.)

There were also farmers who shared that with the availability of abundant irrigation water, they were able to plant rice instead of corn or root crops. One was even saying that he was able to raise pigs, which also provided them additional income. For instance, according to a farmer from Balaquid, Cabucgayan, Biliran:

Table 102. Description of the MSC stories about increase in income

Theme of Change	Description	Reasons for Considering the Change Important	Site	No. of Stories
Increase in income	Based on the stories narrated by the project beneficiaries, there were five types of experiences related to the improved irrigation system that lead to increase in income. The most common stories were that due to sufficient irrigation water, the farmers were able to get good harvest, the excess of which were sold, resulting to increase in income. There were also farmers who shared that with the availability of abundant irrigation water, they were able to plant rice instead of corn or root crops, hence they earned higher income. Others said they were able to raise pigs, which also provided them with additional income. There was one farmer who said that the income they earned from selling their rice harvest was used by her wife as capital in her mat vending business, and again it provided them with additional income.	To the story tellers, this change is important because the additional income was used to defray their daily household expenses. One story teller even said that they were able to use their income to buy a second-hand motorcycle which they now use as their service vehicle.	Biliran Southern Leyte	11 7

Niadtong wala pay irigasyon, mais lang ako gitanom kay ang mais dili man matrabaho sa kabaw unya barato ra ugmaron kontra sa humay. Sa mais gamay ra ang among kita, mo abot ra og PhP 2,000. Kon humay, maskin mo pisar lang ka og duha ka sako, kapin na PhP 2,000. Bale gamay na lang pod ang among gasto sa pagkaon adlaw-adlaw tungod kay naa na man mi humay pangunsumo. (When there was no irrigation yet, I only planted corn [in my farm] because it does not require much cultivation by the carabao and is cheaper to cultivate than rice. But with corn, our income was only small: about PhP 2,000. When we plant rice, even if we sell only two sacks, we can already get a sale of more than PhP 2,000. Also, our expenses for food has been lessened because we already have rice for home consumption.) [Story No. B-48]

A farmer from Bagacay, Abuyog, Leyte, who is tilling a rice farm in Katipunan, Silago, Southern Leyte also shared:

Ang pinaka importante sa ako mao ang irigasyon kay sa una dili man ko magbasak, magtanom ra man kog duma. ***Karon basak na mas dako og kita na****. Importante ni nga kabag- ohan kay ang pagpanom og duma gamay rag kita. Dili jud maka sustinar sa akong pamilya. Karon naa na koy libre nga bugas, makapamaligya pa jud ko usahay og humay para panud- an*. (The most important change for me is the irrigation because in the past, I did not cultivate a rice field, I just planted rootcrops. Now that I am tilling a rice field, I have bigger income. This change is important because rootcrop production would just provide me with a small income. It cannot sustain the needs of my family. Now, aside from having rice for home consumption, I can also sell some rice to buy viand.) [Story No. SL-22]

Moreover, a farmer from Hingatungan, Southern Leyte narrated:

Ang importante nga kabag- ohan mao ang sa tubig jud kay diha man ming mga mag- uuma sa basakan nabuhi… Importante ni nga kabag- ohan kay sa tabang sa Ginoo, nidako ang akong abot sa akong pagpamasak. Sa una gamay ra man kay di pa man dako among basak tungod kay gamay pa man og tubig. Karon nga naa na mi irigasyon, na extendan akong basak tungod sa tubig. Unya ang irigasyon nakatabang pod sa akong ***baboyan*** *kay mao may ako ilimpyo ang tubig sa irigasyon* ***so doble ang income nako***. (The important change is on the [irrigation] water because our lives as rice farmers depend on it…. This change is important because with the help of God, our harvest has increased. Before, our harvest was low as we only had a small rice field because water was scarce. Now that we already have irrigation, we were able to expand our rice farm. I also used the irrigation water in cleaning my piggery, so my income sources doubled.) [Story No. SL-20]

There was also one farmer who said that the income they earned from selling their rice harvest was used by her wife in mat vending business, which provided them with additional income. According to the farmer from Hingatungan, Silago, Southern Leyte:

Tungod sa tubig, mi taas ang among abot kompara sa una nga pangkonsumo lang. Tungod sa abot nga mitaas, nanobra na ang among pangunsumo mao nga nakabaligya na sad mi og humay nga salin sa among gi bilin para pangunsumo. Og tungod kay nakabaligya man mi, ***may kakuhaan na ang akong misis para pangkapital sa iya ganahan nga business - ang pagbaligya ug banig****. Nakatabang ang among pamaligya ug banig sa among adlaw-adlaw nga panginahanglan; unya ang akong ubang*

bata nga tambay ***naka eskwela na tungod sa among ma income sa banig***. *Bahalag ginagmay ra na nga income sa banig, at least nakatabang sa akong pamilya*. (Because of the irrigation] water, our yield has increased compared to before, which was only enough for home consumption. Since our yield increased, we have more than enough for home consumption and so we are beginning to sell our surplus rice. Since we are able to sell rice, my wife has been able to get additional capital for her business on mats. Since we were already able to sell mats, the sale was used to defray our daily household expenses. My other children who had just been staying idle at home are now able to go to school because of our income from selling mats. The income from selling mats may be small only, but it was able to help my family.) [Story No. SL-14]

Increase in Food Availability. A total of 15 stories had this theme. Seven were narrated by project beneficiaries from Biliran, and eight were told by beneficiaries from Southern Leyte (Table 103). Generally, the storytellers were saying that the improved irrigation canals provided them with abundant and continuously available water for their farms, hence, they were able to plant rice twice a year, resulting to more harvest and increased availability of rice for home consumption. For them, this change is important because this provides them assurance that they will not go hungry because they have food until the next cropping season. Some emphasized that in the past when they were still dependent on rain, they could not plant rice always, so it was a problem for them to secure availability of rice for food. Sometimes they would borrow from their neighbors, or obtain rice on credit from the local sari-sari stores. Now that there is already abundant water, they can plant rice always and would not worry about their source of food anymore.

Table 103. Description of the MSC stories about increase in food availability

Theme of Change	Description	Reasons for Considering the Change Important	Site	No. of Stories
Increase in food availability	The story tellers were saying that because of the abundant and constantly available water, their rice harvest increased since they can already plant rice twice a year, so they already have more than enough rice for home consumption.	This change is important to them because it gives them assurance that they will not go hungry because they have food to last until the next cropping season. One was even saying that their budget to buy rice can now be used to buy his maintenance medicine.	Biliran Southern Leyte	7 8

Below are some examples of stories about increase in food availability as a result of the improvement in the irrigation system. According to a farmer from Balaquid, Cabucgayan, Biliran:

Dako kaayong kausaban para nako kay sa una, magsige kog palit og bugas. Karon, dili na. Makakaon nako sa among hinaguan…. Ang ako ipalit [og bugas], ako nalang ipalit og medisina sa akong maintenance maong dako jud og tabang ang ARISP-III namo. (It is an important change for me because before, I always buy rice [for our food]. Now I don't [buy rice anymore]. We are now able to produce food from our hard work. My previous budget allocated for rice is now used to buy my maintenance medicine. ARISP-III is really a big help to us.) [Story No. B-32]

Also, according to a farmer from Hingatungan, Silago, Southern Leyte:

Ang irigasyon man jud ang nakatabang namo kay syempre isip usa ka mambabasak, ang tubig man gajud ang among pinaka kinahanglan kay kung way tubig dili jud mi makapamasak. Kining naa tay kaugalingon nga bugas, dako jud nga tabang namo kay naa na mi seguridad nga makakaon jud ang among pamilya. Di na mi ma problema og asa mi og bugas kay naa na may among kaugalingon, maka income pa jud mi. (It is the irrigation that helped us because as rice farmers, we need water the most because when there is no water, we cannot cultivate our rice farms. Having our own rice is a big help for us because we are assured that our family will have food to eat. We won't have problem anymore on where to get milled rice because we already have our own, we can even earn more income.) [Story No. SL-25]

Improved Living Conditions. There are six stories about this kind of change; five came from Biliran, and one (1) was from Southern Leyte (Table 104). Generally, these stories were telling about farmers feeling that their lives are now becoming better as a result of the improvement of the irrigation system. They said that because of the abundant water, they have better harvest and more income. This enabled them to have their own rice for home consumption, buy some household assets, repair their house or send their children to school. According to a farmer-beneficiary from Tamarindo, Almeria, Biliran:

Ang pinaka importante nga kausaban nga mi resulta sa kahayahay sa akong kabutang karon kaysa sa una, kay tungod niini nga project, naka sideline nako kay di na man rotational ang tubig. Pinaagi niini, medyo ni hayahay akong kabutang. Gawas pa niana, tungod sap ag-usbaw sa amo ani, dili na mi mopalit og bugas para konsumo. (The most important change which resulted to an improvement of our living condition now than before, is that because of this project, I was able to have a sideline job because distribution of irrigation water is not anymore rotational. Because of this, our living conditions improved a bit. Besides that, because our harvest increased, we do not anymore buy rice for our food consumption.) [Story No. B-22]

A farmer from Balaquid, Cabucgayan, Biliran also narrated:

Importante ini nga kabag-ohan kay naka diskanso kami pagpinalit hin bugas para ha amon pangkonsumo. Maaram na ako han una pa mag- uma pero mas dumamo pa tak kaalam hin mga sugad nga pag-uma tungod han mga trainings. Pwerte ka importante kay tungod hini nga project ha ARISP-III, nakapa eskwela gehap ak tak mga anak ngan tungod ha amon income ha humay, nakapa repair ako hit akon balay. Bagan haruhay na gad man it amon kabutang. (These changes are important because now I can rest from buying rice for our food consumption. I already know how to farm before, but my knowledge in farming increased because of the trainings. Another very important effect of ARISP-III is that, I was able to send my children to school and have our house

repaired because of our income from rice. Our living condition seems better now.) [Story No. B-31]

Table 104. Description of the MSC stories about improved living conditions

Theme of Change	Description	Reasons for Considering the Change Important	Site	No. of Stories
Improved living conditions	According to the storytellers, the improved irrigation enabled them to have higher rice harvest and income which improved their living conditions as evidenced by their being able to have their own rice for home consumption, buy household assets, repair their house or send their children to school. The other storytellers were also saying that their living conditions got better because aside from having lesser conflict with other farmers over water, they were also able to have sideline jobs since they do not have to stay longer in their farms to monitor the irrigation water.	These changes were important to them because it made them feel better than before	Biliran Southern Leyte	5 1

Moreover, a farmer beneficiary from Hingatungan, Silago shared that because of the improved irrigation system, his life as a farmer has become easier or better since he does not get involved in conflicts over water anymore, he could plant rice twice a year, his yield has increased, he has more than enough rice for home consumption, and he need not monitor his farm always for water availability. According to him:

Irigasyon nga may sementadong mga kanal ang dakong tabang. Tungod kay dili na mo hunob ang tubig, maapod na ang tanan basak, dili na moabot sa tinigbasay tungod sa paglalisay ug pag- ilog- ilog sa tubig. Tungod sa ka abunda, kaduha na mi makatanom ug naa nay dugang nga konsumo. Importante jud ni nga kabag-ohan nako kay sa una gud tungang gabii o sa sayo sa kaadlawon ko mo tukad para lang magpatubig sa ako basakan. Unja na hulog nga ni doble sad ako abot kay kaduha nako makapatanom; sauna kausa ra. Unya karon gamay nga oras na lang akong ako igahin sa pagbantay sa patubig sa basakan. (Irrigation, with the cemented canals, are a big help for us because water is not wasted anymore, it could be distributed to all rice farms, and people need not

reach the point of hacking each other because of their quarrel over irrigation water. Because water is now abundant, we can already plant rice twice a year, resulting to more rice for consumption. This change is important for me because before, I had to go to my farm at midnight or dawn to irrigate my rice field. Also, my harvest has doubled because I can already plant twice a year, unlike before when I could plant rice once a year. Also, I now spend only a shorter time to watch over the irrigation of my farm.) [Story No. SL-9]

Improved Livelihood. There are only two stories with this theme, and all of these are from the beneficiaries in Biliran (Table 105). Generally, the storytellers were saying that because of the availability of irrigation water, they were able to cultivate rice in areas that were not planted rice before due to lack of water. Before the improvement of the irrigation canals, one of the storytellers was only planting rootcrops, while the other was driving a motorcycle for livelihood. Both obtained only a meager income. When they were able to cultivate their rice fields, they were able to have rice for home consumption, and even earn a little income from selling rice. For instance, according to a farmer from Balaquid, Cabucgayan, Biliran:

Table 105. Description of the MSC stories about improved livelihood

Theme of Change	Description	Reasons for Considering the Change Important	Site	No. of Stories
Improved livelihood	The storytellers said that because of the improved irrigation, they were able to cultivate a rice field which provided them with improved livelihood. One storyteller was just planting root crops before the irrigation water came, while the other was a motorcycle driver who just left his farms idle since he could not cultivate it due to lack of water.	The change [being able to cultivate of rice field] was considered important because the rice fields became their main source of livelihood	Biliran	2

Nausab ang among pangita ug panginabuhian *kay sa una, wala pa ang irigasyon, adto mi sa bukid magdala og bolo kay mananom og saging, camote, balanghoy, kay wala man tay irigasyon. Sa karon nga naka pasakay na, nausab na ang among gitanom. Karon, makabasak nami og kaduha sa usa ka tuig. Maka income na pod mi og dako kay makabaligya na man mi og humay ug moabot tag 80 ka sako among ma harvest sa usa ka tamnanan. Importante ni para namo nga maoy gisaligan ang pag- uma sa bukid alang sa pang adlaw- adlaw namo nga pagkaon. Importante ni nga kausaban para namo kay tungod ani maka kaon na mi og katulo sa usa ka adlaw. Dili na mi maglisod sa among pangunsumo*. (Our livelihood changed because before, when there was no irrigation yet, we would go to the upland areas bringing our bolo to plant banana, sweetpotato, cassava. Now that we have irrigation canals, the crops that we plant have

been changed. We now have rice fields and we can plant rice twice a year. We can also earn bigger income because we can already sell rice since our harvest in one cropping would already reach 80 cavans. It is important because we rely on farming for our daily food and household needs. This change is important because now we can already eat three times a day. It's not any more difficult for us to meet our food needs.) [Story No. B-30]

Better Quality Rice. There is only one story about this kind of change, and this came from a beneficiary in Biliran Province (Table 106). The storyteller said that because of abundant water, the quality of his rice harvest is now better. According to the farmer from Basud, Cabucgayan Biliran:

Tungod niini nga project, ni diritso na akong tanom tungod sa patubig. Maayo na ang kalidad sa akong humay. Tungod niining mga kabag-ohan, nakapa eskwela ko sa akong anak ug pag- umangkon….. (Because of this project, I could already plant rice continuously. The quality of my harvested paddy rice also became better. Because of these changes, I was able to send my child and nephew to school….) (Story No. B-24]

Table 106. Description of the MSC stories about better quality rice

Theme of Change	Description	Reasons for considering the change important	Sites/No. of Stories
Better quality rice	The storyteller said that because of the improved irrigation project, he could already plant rice continuously and that the quality of his rice harvest also became better.	Because of this change, the farmer was able to send his children to school	Biliran – 1

4.5.4.1.4 Social Changes

A total of 35 MSC stories were categorized under social changes (Table 107). These stories represent three kinds of change, namely: less irrigation hassle (51%), less conflict over water (37%), and more sufficient water due to less water wastage (11%).

Less Irrigation Hassle. There were 18 stories about this kind of change (Table 107). Most (14) of the stories came from the beneficiaries in Southern Leyte, and four came from Biliran. Generally, the storytellers were saying that because of the cemented irrigation canals, it became less burdensome for them to irrigate their rice farms because water is already abundant and is continuously available; as such, they need not stay in the farm for a long time to wait for the water to reach their farms. Also, they don't need to keep on going back to the farm to monitor if water is still available. Moreover, since the canal is already cemented, they do not need to clean it always unlike their earthen canal before which needed frequent weeding. Also, unlike earthen canals, the cemented canals are not easily destroyed during heavy rains so they need not repair it always. In short, there is less hassle on their part when they irrigate their rice farms now that the canals are cemented. To them this change is important because since they do not need to spend more time in their farms to monitor water availability, they have time to do other things like staying at home to take care of their children, attend to their responsibilities

as officers of their associations, or to look for other livelihood. For instance, according to a farmer beneficiary from Balaquid, Cabucgayan, Biliran:

Maayo na karon nga may tubig na kay dili na man mag ilugay ang mga tawo. Sa una obligado gyud nga mosaka sa bukid aron pag monitor sa tubig sa pasakay. Karon, bisag tagsa ra mosaka, okay ra kay ang tubig pirme na man. Importante ni kay dili na kinahanglan nga mosaka ko pirme sa bukid labi na og gabii kay pirme na man ang tubig. Nadugangan pod ang akong oras sa trabaho sa lain sama sa pagtrabaho sa construction kay dili na man kinahanglan gyud nga I monitor ang pasakay. Tungod ani, nadugangan pod ang akong kita. (It's good now that we already have enough water because the people are not quarrelling over water anymore. Before, I felt obliged to go to the farm to monitor the water in my rice field. Now, even if I visit my farm less frequently, it's okay because water is now available always. This is important because there is no need for me to go to my farm always, especially in the evening. Now I have more time for additional livelihood like construction because I don't need to monitor my rice field always.) [Story No. B-64]

Also, according to a farmer beneficiary from Katipunan, Silago, Southern Leyte:

Kining pal-og lang jud nga gipa semento na sa ARISP-III, mao kini ang dakong nabag- o kay tungod niini dili nako mamroblema ig ting- uwan na kung kusog ang uwan, magkina unsa man, dili na basta- basta maguba o mabungkag ang pal- og. Dili nako ura- urada mag sige og bantay sa basak, maghuwat na ayadon kay sementado na man. Tungod niini mas natagaan nako og oras ang akong mga anak ug nabantayan sab nako sila og sakto ilabi na nga wala diha ila inahan. Dili nako maproblema sa pagbantay sa basakan og mo uwan ug kusog ug wala nay hago ug gasto pagkub- kob pa. (Cementing the irrigation canals by ARISP-III has caused a very significant change because it eliminated the need for frequent repairs during the rainy season. I do not have to keep on watching my farm and waiting when the canals would be repaired because these are now cemented. Because of this, I am able to give more time for my children to take good care of them especially that their mother is not here. I do not anymore have to frequently check my rice field when it rains hard, and we need not spend so much effort and money to dig canals.)

Less Conflict Over Water. There were 13 stories about this change (Table 107). Six came from the beneficiaries in Biliran Province, and seven (7) were from the beneficiaries in Southern Leyte. The story tellers were generally saying that when their respective irrigation systems were rehabilitated (i.e., dams and canals were repaired and cemented), water became abundant and continuously available so it could be evenly distributed to the rice farmers. Because of this, farmers are not anymore quarreling over water. For the storytellers, this change is important because it brought peace and unity among farmers in the area.

Table 107. Themes of change of the MSC stories under Domain 4 (social changes)

Theme of Change	Description	Reasons for Considering the Change Important	Number of Stories		Total	Percent
			Biliran	So. Leyte		
Less irrigation hassle	According to the storytellers, because of the cemented irrigation canals, it becomes less burdensome for them to irrigate their rice farms because water is already abundant and continuously available, so they need not stay in the farm for a long time to wait for the water to reach their farms and to keep on going back to the farm to monitor if water is still available. Also, since the canal is already cemented, frequency of cleaning is lessened and the canals are not any more easily destroyed during heavy rains so they need not repair it always.	The change is important to the storytellers because it becomes easier for them to irrigate their rice farms and since they need not visit their rice farms always to check for water availability, they now have more time for other things like staying at home to take care of their children, attend to their responsibilities as officers of their associations, or to look for additional livelihood.	4	14	18	51.43
Less conflict over water	The story tellers were generally saying that when their respective irrigation systems were rehabilitated (i.e., dams and canals were cemented) water became abundant and continuously available so it could be evenly distributed to the rice farmers. Because of this, farmers are not anymore quarreling over water.	To the storytellers, this change is important because it brought peace and unity among farmers in the area. It also lessened farmers' burden in irrigating their farms, enabled them to plant rice during the planting seasons, get good yield and consequently enough rice for home consumption.	6	7	13	37.14
Less water wastage	The story tellers shared that because the irrigation canals have already been cemented there is less leakage and water does not seep easily in the soil, so there is now less water wastage.	This change is important because with less water wastage, water becomes sufficient so they can get better yield from their rice plants. Also, some said that with less water wastage, they do not need to stay in their farms always to monitor if water is available.	1	3	4	11.43
Total			11	24	35	100

An example of this kind of story is the one narrated by a farmer beneficiary from Sampao, Almeria, Biliran. According to him:

Mas nahimong organisado ang paagi sa among pagpatubig kay bahin- bahin man mi sa adlaw sa pagpatubig pinaagi sa rotasyon. Dili na ingon sa kaniadto nga mag-ilogay sa pagpatubig. Kusog- kusog naman hinuon ang tubig sa pagkakaron kumpara sa una… maskin og ting huwaw naa gihapon mi tubig para sa amo kabaskan ug maka- ani gihapon mi og dako- dako. Dili na pod mi mamalit og pangkonsumo tungod sa taas taas na ang ani. (Distribution of irrigation water to our rice fields became more systematic because we have prepared a rotational schedule of irrigation. It's not like before when people quarrel over irrigation water. There is more abundant water now... even during dry season; this enabled us to get more harvest. With the better harvest, we do not need to buy rice for home consumption.) [Story No. B-57]

Also, according to a farmer beneficiary from Hingatungan, Silago, Southern Leyte:

Pag abot sa irigasyon, dako og kausaban kay ang mga opisyales maayo ang ilang pagduma sa mga tawo. Nabahinan ang tanan sa tubig, wala na nagkagubot. Sa una samok ug daghan banha kay ilog- ilog pa man og tubig. Importante kaajo kay mas nagkahiusa naman ang mga tawo bahin sa pagpatubig. (When the irrigation [project] came, there was a big change because the officers were able to manage the project well. All the people received their fair share of the irrigation water, so there was no conflict anymore unlike before when it was chaotic and people had lots of complain because they were quarreling over water. This is very important because the people here had become united in the irrigation activities.) [Story No. SL-47]

Less Water Wastage. Four stories narrated about this kind of change (Table 107). Three came from Southern Leyte and one (1) came from Biliran. These stories were generally saying that because the irrigation canals have already been cemented, there is less leakage and water does not seep easily in the soil, so there is now less water wastage. For the storytellers, this change is important because they now have better yield since water is already sufficient for their farms. Also, they need not spend so much time monitoring if water is still available because the supply is already sufficient.

An example of this story is that narrated by a farmer beneficiary from Iyusan, Almeria, Biliran:

Dili na kaayo usik ang tubig kay sementado na ang kanal*, dili na pareho san una nga bisag asa lusot. Karon, di na kaayo ko mamroblema sa tubig. Dili na sad kaayo ko kinahanglan magbantay sa ako humay kung naa bay tubig or wala*. (There is not much wastage of water now because the canals are already cemented, unlike before when water would just sip anywhere. Now, I do not much problem about irrigation water. As such, I do not need to keep on checking if there is water in our rice field.) [Story No. B-58]

Another example is a story narrated by a farmer beneficiary from Hingatungan, Silago, southern Leyte. He said:

Dako dako na man ang gi improve pod aning irigasyon maong nakatabang jud ni namo. Ang kaning among irigasyon sementado na, ang tubig murag na control na

gajud dili parehas sauna nga dili maangay ang tubig. ***Wala nay mausik nga tubig tungod kay sementado na****. Mas grabe pa pod ang ilog- ilog sa tubig sa una. Karon nga na semento na murag dako dako na ang abot kay wa na man lagi mausik maong naka sustinar na jud ang tubig. Sa una gagmay ra jud ang amog abot, mga 10 ka sako ra jud. Maajo man karon kay na arang- arang na man*. (Our irrigation has improved a lot; that is why it was able to help us. Our irrigation canals are already cemented, and the water is already controlled, unlike before when distribution was not fair. Water is also not wasted since the canals are already cemented. Conflict over water was also more serious before than now. Now that the [irrigation canals] are already cemented, our harvest has improved because water is not anymore wasted such that it can sustain [our farm needs]. In the past, we had low harvest, about 10 sacks only. It better now because our yield is better.) [Story No. SL-34]

4.5.4.1.5 Other Changes

There were 11 stories about other changes. One (1) story was about improved attitude towards ARISP-III, nine (9) were about no significant changes, and one (1) was about a negative change (Table 108).

Table 108. Themes of change of the MSC stories under the Domain 5 (other changes)

Theme of Change	Number of Stories		Total	Percent
	Biliran	So. Leyte		
Improved attitude towards ARISP-III	-	1	*1*	9.1
No significant change				
No change in yield due to unpredictable weather (B-68)	1	-	1	
Conflicts still arise due to insufficient water (SL-59)	-	1	1	
Irrigation water is still insufficient (due to some reasons including unclear water distribution system, extension of canals, uncemented canals, reduction in the volume of water flowing in the canals, and non-observance of irrigation rules by some farmers (B-66, B-67, B-69, B-70, B-72, SL-60, SL-61)	5	2	6	
Sub-total	*6*	*3*	*9*	*81.8*
Negative changes				
Extension of canal brought more hassle (B-71)	1	-	1	
Sub-total	*1*	-	*1*	*9.1*
Total	7	4	11	100.0

Improved Attitude Towards ARISP-III. The story about improved attitude towards ARISP-III was shared by a farmer beneficiary from Hingatungan, Silago, Southern Leyte. He said:

Sa pagkahibawo na nako sa ARISP-III kung unsa ba gajud ni, na engganyo ko ug nang recruit kog mga farmers nga wala pa na miyembro ani nga proyekto ug sa sige nakog explain sa proyekto, nagpa miyembro sila paghuman sa duha ka adlaw. Damo nakoy kauban nga mga babae sa NIA. Tungod kay na miyembro na sila, nakatabang ko sa pagpanindot sa ilang kinabuhi ug sa ilang mga basakan ug tungod sad kini sa proyekto. (When I came to know about ARISP-III, I was encouraged, so I recruited other farmers who were not yet involved to also participate in the project. I explained the project to them and they decided to participate after two days. I already have more co-members of NIA who are women. Because they became members, I was able to help improve their lives and their rice fields.) [Story No. SL-58]

No Significant Change. There were nine stories about no significant change being experienced despite the improvement of their irrigation system. Six were narrated by beneficiaries from Biliran and three were narrated by beneficiaries from Southern Leyte. The stories about no significant change have three sub-themes, including the following: (1) no change in yield due to pest infestation and unpredictable weather conditions, (2) conflicts still arise due to insufficient water, and (3) irrigation water is still insufficient due to some reasons. Each of the sub-themes are discussed below.

No change in yield due to unpredictable weather. The lady farmer-beneficiary from Libertad, Cabucgayan, Biliran revealed that the irrigation project is good. But even with this improved facility provided through ARISP-III, she did not experience improvement in her crop yield due to pest infestation and unpredictable weather. She said:

Wala may ingon nga kausaban labi na kung abot ang hisgotan. Kay kung e kumpara nako sa una nga nananom pa mi og mga gulay sama sa repolyo, pechay ug sibuyas, mas maayo ang among abot kay gamay ra mi og gasto. Okay gad ang basak pero dako man ang gasto labi na sa karon, dili ka kasigurado sa panahon, mo kalit og bagyo ug mo atake ang mga mananap. Sa una mas maayo to nga nag- tanum pa mi og utanon kay kada nako biyahe makahalin ko og PhP3,000 ug mao pod ni ang nakapahuman sa pag- eskwela sa akong anak. (There is no change, especially when we talk about yield. If I compare it to the past when we were still planting vegetables like cabbage, pechay and onion, we had good income because we had lesser expenses. Rice farming is also okay but it incurs bigger expenses. Moreover, at present one cannot sure about the weather – typhoons would suddenly come and pests would attack the plants. It was better when I was still planting vegetables, because every time I market it, I could earn about PhP3,000. This has helped get my child to finish her education.) [Story No. B-68]

This story shows that there are other factors, aside from irrigation, that affect farmers' success in their farming ventures, such as pest infestation and adverse weather conditions.

Conflicts still arise due to insufficient water. A farmer from Hingatungan, Silago, whose farm is located in the downstream portion of the irrigation canal, said that

he experienced no significant change since farmers are still quarreling over the limited volume of water provided by the irrigation system. He said:

Kung about sa patubig, naa man sad nabag- o pero dili kaayo dako. *Oo naa bitaw patubig pero dili kaayo abunda kay hangtod karon mag ilog- ilog pa man gihapon sa tubig ang mga farmers unya ang mga semento na kanal kay dali ra maguba tungod sub-standard ang pagkabuhat*. (Talking about irrigation, there are changes but not that much. Yes, there is irrigation but the water is not that abundant because until now, the farmers would still haggle over water, and the cemented canals are easily damaged because of the sub-standard construction.) [Story No. SL-59]

Irrigation water is still insufficient. There were seven farmer beneficiaries – five from Biliran and two from Southern Leyte - who narrated that despite the irrigation project of ARISP-III, they still experienced insufficiency of irrigation water especially during dry season due to some reasons, including unclear water distribution system, uncemented canals, reduction in the volume of water flowing in the canals, and non-observance of irrigation rules by some farmers. For instance, according to a project beneficiary from from Balaquid, Cabucgayan, Biliran:

Mao man lang gihapon. Walay kabag- ohan sa amo kay sa panahon sa ting init maglisod man gihapon mi og tanom tungod kay dili sakto ang distribusyon para sa among basak. Ang resulta, gamay lang ang maani sa ting harvest kay ilog- ilog kung kinsay makatubig og una. *Sa una, mo abot og tag 40 ka sako ang among ma harvest. Pero karon ginagmay na laman tungod kay walay klaro ang distribusyon sa tubig nga mi resulta na mas naglisod na mi sa among pagpanguma kay ilog- ilog man*. (It's just the same. There is no change here because during dry season, we still find it difficult to plant rice because the distributed water for our rice farms is not enough. This results in a low harvest because we still had to haggle who can get water first. Before, we can harvest up to 40 sacks – now our harvest has decreased because of inadequate distribution of water which makes our farming more difficult.) [Story No. B-66]

A farmer from Hingatungan, Silago also shared that even with the irrigation system provided by ARISP-III, he still experienced insufficiency of water. He said:

Kadtong wala pa na semento ang among kanal sa basakan, okay o sakto man ang tubig sa tig init ug sa ting uwan. Unya kadtong na semento na ang kanal, dili mi mamroblema sa tubig sa ting ulan pero kung ting- init na, dili na man sakto ang tubig, magpawong-pawong na man hinuon. Wala may ayo ang proyekto kay abi man nako og kusog ang tubig pero nag pawong- pawong na man hinuon…. naglisod na ko og patubig sa akong basakan. Mas dako na ang oras nga akong gigahin sa pagsige nakog patubig. Na doble na hinuon ang akong trabahuon sa pagpatubig lamang na. (When our irrigation canals were not yet cemented, the water was enough both during dry and rainy season. When the canals were cemented, we still do not have problem with water during rainy season; however, during dry season the water becomes scarce as it goes off and on. I thought the project would be good, but it ended up that the water becomes lesser now than before… I find it difficult to irrigate my field because I have to increase the frequency of irrigation. The time spent to irrigate the farm has doubled.) [Story No. SL-61]

There were also two farmers from Biliran who narrated that the irrigation project's benefit was not sustained because of the abuses done by other farmers, especially those with farms located in the upstream and midstream sections of the area. They said that as of now, water is again lacking such that there are times that they could not plant rice in their farms since there is no water. For instance, according to a beneficiary from Iyusan, Almeria, Biliran:

Patubig unta kay para mo nindot ang kalidad sa humay. Maka ani na mi og ensakto. Kung ensakto na gani ang ani, unya gamay ra ang gastos nimo, dako imo kita. Ingon ana unta ang mahitabo. Pero ang dakong butang nga nahitabo diha kay ang mga buho nga gibuhat sa NIA nga sinukod aron sakto ra ang tubig nga mogawas sa outlet, gi utro sa mga tawo, ilang gipadak-an para mokusog ang ilang tubig. Sa ila basak na mo sulod ang tubig, dili na sa amoa. Kaming mga taga lower, luoy. Ang akong basak naapektohan, wa mi katanom. Ila man gipang silsilan, gipadak- an pa. Usa pa, lahi na ang panahon karon. Sa una, kaduha mi makatanom kay daghan gyud ang uwan panahon sa ting- uwan, ting uwan gyud. Sakto sa buwan. Karon, ang ting- uwan, ting- init na. (It should have been the irrigation so that the quality of our rice would improve and we can enough harvest. If we can harvest enough, and we only have little expenses, we can have big income. That was the intention. However, what is actually happening is that the water outlets made by NIA that had been properly measured so that the volume of water that would flow to the rice field would just be enough, were tampered by the people in the upstream and midstream portions. They increased the size of the outlets so that the water flowing to their rice fields would become strong. The water would flow to their farms, and none was left for our farm. We at the downstream are pitiful. My rice field has been affected – we were not able to plant rice. They tampered with the water outlets; making these bigger. Another thing is, the weather is different now. Before, we could plant twice a year because the rain occurs in the rainy season. Now, the supposed to be rainy season is already dry.) [Story No. B-70)

A project beneficiary from Balaquid, Cabucgayan, Biliran also said:

Wala may ingon nga maayong kausaban kay sa pagka karon ngani dili man pirmi ang tubig sa among pasakay hinungdan nga gamay na lang ang among ani. Usahay magpaabot ra ko sa uwan. Kon e kumpara san una, mas dako- dako pa to ang among ani kay mo abot pa og mga 50 sacks. Karon naa na lang sa mga 40 sacks. Naay ubang tawo sa ibabaw nga pakusgan ang ilang tubig mao nga dili na ko makagamit diri sa ubos. (There is no such thing as good change because now we still don't have permanent source of water for our rice fields, that's why we only have low harvest. Sometimes, I would just wait for the rain. Compared before, we had bigger harvest because it would reach up to 50 sacks. Now, we can harvest about 40 sacks only. Some people who have farms upstream would use more water that is why I can no longer use water here downstream.) [Story No. B-67)

Another project beneficiary from Iyusan, Almeria, Biliran also narrated that despite the presence of the irrigation system, he still experienced scarcity of water since the canal passing through his farm is not yet cemented. He said:

Ang irigasyon unta to, pero wala ko makabenepisyo tungod kay wala ma-semento ang kanal sa ako basak.... nigamay ang akong cultivated area para sa humay tungod kay wa na'y sakto nga tubig sa ako basak kay wala ma-apil og semento ang kanal. Karon, wa na ko makabaligya og humay. Pang-kunsumo nalang namo unya kuwang pa gani sa

pang-kunsumo namo ang among ma-ani. (It would have been the irrigation, but I was not able to benefit because the canal passing through my rice field has not been cemented…. my cultivated area for rice has been reduced because there is lack of water for my farm since the irrigation canal passing through my rice field was not cemented. Now, I am not able to sell rice and our harvest is not even enough for home consumption.) [Story No. B-69]

Negative change. One story related a negative change in terms of the hassle brought about by the extension of irrigation canal. It was shared by a farmer from Balaquid, Cabucgayan, Biliran. This farmer said that before ARISP-III, they had sufficient irrigation water. But when ARISP-III was implemented, they extended the irrigation canal to cover more area, so he began to experience conflicts over water. He said:

Sa wala pay irigasyon [sa ARISP-III], daghan ug abunda man mi sa tubig kay ang kanal kutob lang sa amo basakan. Karon na mi abot ang ARISP-III, ila gisumpayan ang amo kanal na mi resulta nga daghan na mi og kailog sa tubig. Tungod kay nag- agaw agaw na man sa tubig, daghan nako maka away. Dili nako makatarong og trabaho kay mag sige huna- huna sa basakan kay basin wa na ko maani ig ting- ani na kay walay saktong tubig. Sa una, dili mo suli ig patubig. Karon, kaduha or kadaghan na masuli- suli kay basin giilog na sad ako patubig (Before the irrigation project, we had abundant water supply because the canal was just up to our rice field. When ARISP-III came, they extended the irrigation canal which resulted to more users haggling over the water. Because we were already haggling over water, I gained more enemies. I could not work properly because I keep on thinking about our rice field, afraid that I may not have any harvest during harvest season because there is not enough water. Before, I would not check after irrigating the rice field. Now, I check the field several times because other may have stolen the water.) [Story No. B-71]

4.5.4.1.6 Levels of Changes and Indicators of Communal Irrigation System/ Project Impacts

To determine the levels of impacts from the irrigation project of ARISP-III, the themes of the significant changes narrated by the beneficiaries were classified based on Bennett's Hierarchy of Program Evidence. According to Sutherland and Leech (2007), in Bennett's Hierarchy of Program Evidence, levels 1 to 3 can provide information about the efficiency of a planned activity, but not about the intended results or effectiveness of the activity or program. If the purpose is to measure the impacts of the program, it is more important to measure evidences further up the ladder of the hierarchy (i.e., levels 4 to 7 in Bennett's Hierarchy).

Results of the analysis on the levels of impacts of the irrigation project are presented in Table 109. A great majority (92%) of the changes described in the stories shared by the Irrigation Project beneficiaries were about positive changes that belonged to the higher levels of Bennett's Hierarchy of Program Evidence (i.e., levels 4 to 7). This suggests that the Irrigation Project had already made positive impacts on the beneficiaries.

Table 109. Levels of program outcomes to which the changes experienced by the beneficiaries of the communal irrigation system projects correspond

Level of Outcomes	Theme of Change	Project Sites/Number of Stories		Total	Percent
		Biliran	So. Leyte		
4 - Reactions to ARISP-III	Improved attitude towards ARISP-III	-	*1*	*1*	*0.75*
5 – KASA Changes	Increase in knowledge about proper irrigation	*1*	-	*1*	*0.75*
6 – Behavioral changes	Improved irrigation services	7	5	12	
	Increase in cropping frequency	5	-	5	
	Change in farming practice	1	1	2	
	Sub-total	*13*	*6*	*19*	*14.28*
7 – End results (Changes in the conditions of the program clientele)	Improved rice growth	0	2	2	
	Better quality rice	1	0	1	
	Increase in yield	14	9	23	
	Increase in income	11	7	18	
	Increase in food availability	7	8	15	
	Improved living conditions	5	1	6	
	Improved livelihood	2	-	2	
	Less conflict over water	6	7	13	
	Less irrigation hassle	4	14	18	
	More sufficient water due to less water wastage	1	3	4	
	Sub-total	*51*	*51*	*102*	*76.12*
Other Changes	No significant changes (*no change in yield due to unpredictable weather, conflicts still arise due to insufficient water, still have difficulty irrigating the farms due to lack of water*)	2	2	4	
	Negative changes (*More burdensome to irrigate due to insufficient water; unable to plant, reduced harvest and reduction in area cultivated due to lack of water*)	5	2	7	
	Sub-total	*7*	*3*	*10*	*7.52*
Total		72	62	133	100

More than three-fourths (77%) of the stories were about changes in the conditions of the program beneficiaries, which correspond to the highest level of Bennett's Hierarchy of Program Evidence (i.e., level 7). This suggests that the irrigation project had contributed to the improvement in the farming, economic and social conditions of a great majority of the irrigation project beneficiaries in Biliran and Southern Leyte. Due to the improved irrigation system which provided farmers with abundant and

continuously available irrigation water, the project beneficiaries were able to experience increases in yield, income and food availability. Others were able to improve their sources of livelihood. Some were even saying that their living conditions improved because with their increased yield and income, they were able buy some household assets, repair their houses and send their children to school. The irrigation project was able to cause social changes including reduction in the farmers' burdens in irrigating their farms and the reduction in conflicts among farmers since water is already abundant, such that farmers are not already quarreling over water. To the storytellers, these changes are important because it enabled farmers to have more time for other things like taking care of their children and looking for additional livelihood activities. Abundance of water which lessened quarrel over water among farmers resulted in peace and unity among the people in the community.

While a great majority of the stories shared by the beneficiaries were about positive changes, there were few stories about no significant changes (7%) and one story about a negative change. Some farmers, especially those with farms located in the downstream portion of the community, narrated that despite the irrigation project of ARISP-III, they still experienced water insufficiency which led to some undesired consequences like being unable to plant rice, reduction in the area planted to rice, and conflict over irrigation water. Water insufficiency in their case was caused by some factors, including canals being not yet cemented, unclear water distribution policy, and abuses of some farmers with rice fields in the upstream and midstream portions of the community. One farmer was even sharing his experience about a negative change caused by the extension of the irrigation canals to include the rice fields of other farmers, resulting to insufficiency of water in his farm. This suggests that project implementers, or those who are now tasked to monitor the project, should also pay attention to the cases of the farmers who felt that they do not benefit from the projects so that necessary improvements can be done.

4.5.4.2 Changes Experienced by the Beneficiaries of the Farm-to-Market Road Project

There were 17 stories about the most significant changes experienced by the beneficiaries of the ARISP-III in relation to the Farm-to-Market Road component. Nine of these stories were shared by beneficiaries from Biliran Province, and eight were told by beneficiaries from Silago, Southern Leyte (Table 110). Results of the broad categorization revealed that the stories of change told by the beneficiaries of the FMR belonged to two domains, namely: economic changes (35%) and social changes (65%).

4.5.4.2.1 Economic Changes

As shown in Table 110, there were five stories about economics changes, and these were represented by two kinds of change, namely: (1) more livelihood opportunities and (2) reduced transportation cost.

Table 110. Domains and themes of the MSC stories about the farm-to-market road project

Domain/Theme	Description	No. of Stories		Total	Percent
		Biliran	So. Leyte		
Economics changes					
More livelihood opportunities	According to the storytellers, when the road was cemented, they had more livelihood opportunities, including selling of mineral water, being employed during the construction of the road, and driving of *habal-habal* (single motorcycle) to transport passengers. To them this change is important because it provided them with additional income that they used for their daily expenses.	3	0	3	
Reduced transportation cost	Since the road was already cemented, fare in going from one place to another has become cheaper. The other storyteller said that some buyers of their produce are the ones who would go to their place, so they need not spend for the fare in transporting their produce	1	1	2	
Sub-total		*4*	*1*	*5*	*29.4*
Social changes					
Reduced travel time	The storytellers were saying that since the road is already cemented, transport of their produce and farm tools became faster. Some also said that they can go to their farms at a shorter time because it is already easier to travel using the cemented road; some said that motorcycles have become available for faster travel.	4	3	7	
Easier transportation	According to the storytellers, cemented road has helped make transport of produce easier. Before, it was so burdensome because transport was done by manual hauling; they had to travel on foot, and the road was muddy and difficult. Now, it's easier to go from their place to another because of the cemented road.	1	4	5	
Sub-total		*5*	*7*	*12*	*70.6*
Total		9	8	17	100

More Livelihood Opportunities. There were three stories about this kind of change and all of these were shared by project beneficiaries from Biliran. Generally, the storytellers were telling that when the farm-to-market road was constructed, they gained more opportunities to do additional livelihood activities, including selling of mineral water, being employed during the construction of the road, and driving of *habal-habal* (single motorcycle) to transport passengers. To them this change is important because it provided additional income that they used for their daily expenses. For instance, according to a project beneficiary from Tamarindo, Almeria, Biliran:

Para nako ang FMR ang nakahatag og pinaka-maayong kalamboan karon kay nakagamit man pod ko niini sa akong sideline nga pamaligya og mineral water. *Maayo ni siya nga kausaban kay dinhi man ko sa akong pagpamaligya og mineral water nakakuha og gamiton sa among pang adlaw- adlaw nga pangkonsumo sa balay labi na kay dili man mi mamaligya sa among abot sa humay*. *Samtang naghulat ko sa 3 months sa akong humay para maka ani*, *naa gihapon koy income*. (…for me, the FMR was the one that was able to cause the most significant development because it enabled me to engage in a sideline job of selling mineral water. This is a good change because my mineral water vending allowed me to earn income for our daily consumption, especially because we do not sell our rice harvest. Because of the FMR, I still have income to sustain my family while waiting for the 3-month rice-growing period.) [Story No. B-73]

A project beneficiary from Iyusan, Almeria also narrated:

Sa una, wa pay ARISP-III, hago ig trabaho kay daghang buho sa dalan. Ang kalsada karon kay naa nay semento. Ug ang kalsada naa nay maintenance. *Usahay mag maintenance sa kalsada o irrigation unya usa ko sa maka trabaho. Katong pag construct, cash for work, nakakuha ko og PhP2,500. Mao nga makabuhi pod ko sa ako pamilya sa ingon ana nga paagi*. (Before, when there was no ARISP-III yet, it was so tiresome to work because the road had potholes. Now, our road is already cemented and there is already maintenance. Sometimes, when there is job for the maintenance of the road, I am one of those who are hired to work. During road construction, there was cash for work, and I was able to earn PhP2,500. I can also support my family through that livelihood activity.) [Story No. B-74]

Reduced Transportation Cost. There were two stories about this kind of change. One was narrated by a project beneficiary from Biliran, the other was told by a beneficiary from Southern Leyte. These stories were generally telling that since the road was already cemented, the cost in going from one place to another has become cheaper. The other storyteller said that some buyers of their produce are the ones who would go to their farm, so they need not spend for the fare in transporting their produce. According to a project beneficiary from Katipunan, Silago, southern Leyte:

Kining Farm-to-Market Road jud ang nakatabang naho kay sa una, problema man jud ning among kalsada kay rough road jud ni kaajo. Mao nga maglisod mi sa among pagbaligja sa among mga abot kay kaniadto wala juy mamalit. *Sa una kay sa Silago pa mi magbaligja sa among mga humay ug copras. Usahay dako lagi ang bayad kay mobayad pa mi sa hauling. Dako kaajo ang deperensya sa karon ug sa una nga plete kay kaniadto per kilo ang plete. Karon, sila nay mongari so di na mi mamilete*. (The Farm-to-Market road is the one that has helped us a lot. In the past, our road has

been a problem because this had been so rough such that it was a difficult time to sell our farm produce and nobody would come to our farm to buy. We had to sell our rice harvest and copra in Silago, but the transportation cost was big because we had to pay for hauling. There's a big difference in the transportation cost now. While in the past we had to pay for transport per kilo, now the buyers are the ones going to our place. As such, so we do not have to spend for the fare.) [Story No. SL-63]

4.5.4.2.2 Social Changes

There were 12 MSC stories about social changes. Five of these were narrated by beneficiaries from Biliran, while seven were from the beneficiaries in Southern Leyte (Table 110). These stories represent two kinds of changes, namely: (1) reduced travel time and (2) easier transportation.

Reduced Travel Time. A total of seven stories were told about this kind of change. Four were narrated by beneficiaries from Biliran, and three were told by beneficiaries from Southern Leyte. Generally, the storytellers were saying that since they already have a cemented road, it became faster for them to transport their farm produce and farm tools, or to go from one place to another. Some also said that they can go to their farms at a shorter time because it was easier to travel through a cemented road than through a footh path which easily becomes muddy when there is rain. Some even said they can already use motorcycles for transportation. For instance, according to a beneficiary from Balaquid, Cabucgayan, Biliran:

Ang dalan nga sementado nakabulig pag- ayo kay maka shortcut nami ug makadali dali ug pag- adto sa amo basakan … ang pag byahe sa amo abot kadali na lang kay dili na ipa karga sa tawo; ipasakay na lang sa habal- habal. Mas kadiyot lang ang oras sa trabaho. (…the cemented road was able to help us a lot because it allowed us to get to our rice fields at a shorter time…. in terms of transporting our produce, it will take a shorter time and effort because it's not anymore carried by people, but transported through single motorcycle. We spend shorter time for the trasport work.) [Story No. B-54]

Also, according to a project beneficiary from Hingtungan, Silago, Southern Leyte:

Kaning FMR jud nakatabang namo kay sa una lisod jud kaajo ang dan adto labi na sa pag- ambog sa among mga copras ug humay. Lisod jud makasod ang mga motor adto maong pas- anon pa jud to. Sa karon nga maajo na ang dan pwede na nga makasod ang mga motor maong dali na jud kaajo ang paghakot, kung sa una usa ra ka oras kapin maghakutay sa ani, karon pila na lang ka minuto human na. Maka ingon jud ko nga na gamay- gamayan ang among kahago. (The FMR has helped us a lot because in the past, it was so difficult for us to bring down our copra and rice. It was difficult for motor vehicles to reach our place, so we had to transport our produce manually. Now that the road is already good, the motor vehicles can enter into our place; as such it is easier to transport our produce. Before it would take us more than an hour to haul our harvest; now it would take us only few minutes. I can say the burden involved is already less). [Story No. SL-67]

Easier Transportation. There were five stories about this kind of change. One was told by a beneficiary from Biliran, and four were narrated by beneficiaries from Southern Leyte. In general, the storytellers were saying that the cemented road has helped them because it's not that difficult anymore for them to transport their produce. Before, it was so burdensome for them to transport their produce because they did it through manual hauling. They had to travel on foot, and the road was muddy and difficult. Now, it's easier to go from their place to another because of the cemented road. For instance, according to a beneficiary from Tamarindo, Almeria, Biliran:

… ang sementadong dalan… kung wala na maglisod pag- ayo og hakot sa abot. Sa una baktason ra jud na ug dugay kaayo ang paghakot pero karon wala nay hasol ang pagsaka- kanaog sa basakan. (…the cemented road because it's not that difficult for us anymore to transport our produce. Before, it would take a long time to transport our produce because we did it on foot but now, it's not any more difficult to go up and down our rice fields.) [Story No. B-34]

Also, according to a project beneficiary from Hingatungan, Silago, Southern Leyte:

Kaning FMR kay dali ra man mada ang among abot ron nga maajo na ang dan. Halimbawa, kanang among abot karon dili na namo pas- anon pangari sa bay namo. Sa una, nga wa pay kalsada, pas- anon na namo sinako gikan sa basak kutob sa among balay. Karon, didto ra ipadaplin sa karsada, unya hakuton sa habal- habal. Maski pa ingnon nga mamasahe gihapon mi, di na man pod mi hago. Sa una lisod kay dugay namo mahuman ang 46 sacks balik- balikan namong 12 og hakot. Usahay di namo mahuman. Kon mahuman mig ani alas dos sa hapon, mahuman pod namo og hakot na mga alas 5 sa hapon na. Ang karon inig human namo og thresher, mahuman pod namo og padaplin ang ani unja kausa ra hakuton, mahuman na. (The FMR made it easier to transport our produce due to the good road. For example, we do not anymore transport our harvest manually to our houses. Before, we had to carry sacks of rice from the farm to our houses. Now, we just place the sacks of rice along the road, and a motorcycle can transport these to our houses. Even if we still pay for the fare in transporting our produce, the burden is reduced. Before, it was difficult because it would take us a long time to finish transporting 40 sacks of rice; 12 of us had to take several trips on foot to finish transporting. Sometimes, we could not finish transporting. If we finish harvesting at 2:00pm, we finish transporting the harvest at 5:00 pm. Now, after threshing, we can group the sacks of rice together, then it can be transported one time by a vehicle, and we are done.) [Story No. SL-64]

4.5.4.2.3 Levels of Changes and Indicators of Impacts of the Farm-to-Market Road Project

To determine the levels of impacts of the FMR project, the themes of the significant changes narrated by the beneficiaries were classified based on Bennett's Hierarchy of Program Evidence (Sutherland & Leech, 2007).

Results of the analysis (Table 111) showed that all of the changes described in the 17 stories shared by the FMR beneficiaries were about positive changes that belonged to the highest level of Bennett's Hierarchy of Program Evidence (i.e., level

7). This suggests that the FMR project had contributed to the improvement in the economic and social conditions of the beneficiaries in Biliran and Southern Leyte. Because of the cemented road, some of the people in the project sites were able to do additional livelihood activities. The cemented road also contributed to a reduction in the travel time and cost incurred by the people in transporting their produce or in going to other places. It also made travel easier and less burdensome since the cemented road allows vehicles to enter their place, so they need not transport their produce through manual hauling.

Results of the focus group discussions done with the IA officials, some beneficiaries and officials of the implementing agencies, however, showed that there are still portions of the roads that remain uncemented. According to the FGD participants, this is discouraging to some of the people, as this has reduced the benefits that the roads are supposed to give to the people in the project sites.

Table 111. Levels of program outcomes to which the changes experienced by the beneficiaries of the farm-to-market road projects correspond

Level of Outcomes	Theme of Change	Project Sites/Number of Stories		Total	Percent
		Biliran	So. Leyte		
7 – End results (Changes in the conditions of the program clientele)	*Economic changes*				
	More livelihood opportunities	3	0	3	
	Reduced transportation cost	1	1	2	
	Sub-total	*4*	*1*	*5*	*29.4*
	Social changes				
	Reduced travel time	4	3	7	
	Easier transportation	1	4	5	
	Sub-total	*5*	*7*	*12*	*70.6*
	Total	9	8	17	100

4.5.4.3 Changes Experienced by the Beneficiaries of Potable Water System Project

4.5.4.3.1 Environmental Changes

There were only two stories about significant changes experienced by the beneficiaries of the Potable Water System (PWS) project (Table 112). All of these were shared by beneficiaries from Southern Leyte. These stories fall under the category on environmental changes, telling about two kinds of changes, namely: (1) easier access to potable water, and (2) improved quality of drinking water.

Easier Access to Potable Water. The story about this kind of change was told by a beneficiary from Hingatungan, Southern Leyte. He said:

Para naho, maajo jud nga gi ajo nila ang BAWASA kay mao man jud ni para naho ang pinaka importante sa tanan. Kay mag- unsa man nang ilang proyekto kung mangadaot mi kay way tubig nga maajo nga among magamit. Sa kadtong tubod pa ang among tubig lisod jud kaajo kay lajo mi og kab-an unja dugay pa jud makasanggab kay magpilahay pa. Karon maajo na kay sementado na among source unja naa na pod sa sud sa among balay ang faucet. Di na magpinilahay. (For me, it's really good that they improved BAWASA because this is very important. What would be the use of other projects if we just get sick because we do not have safe water to use? During the time when we were still getting our drinking water from a spring, it was very difficult because the source was very far. Moreover, it would take us a long time to fetch water because there was a long line. Now, it is better because our source is already cemented and the water goes to the faucet inside our house. We do not need to fall in line anymore.) [Story No. SL-71]

Table 112. Category and themes of change of the stories narrated by the beneficiaries of the potable water system projects

Domain/Theme	No. of Stories		Total	Percent	Level of Program Outcomes*
	Biliran	So. Leyte			
Environmental changes					
Easier access to potable water	-	1	1	50	7
Improved quality of drinking water	-	1	1	50	7
Total	-	2	2	100	

Improved Quality of Drinking Water. The story about this kind of change was also told by a beneficiary from Hingatungan, Silago, Southern Leyte. According to him:

Ang tubig sa kadtong ang barangay pa ang nag gunit, walay ayo ilaha serbisyo. Pero sa ang ARISP-III na ang nag gunit, ni bentaha na ang tubig nga among gipang inom kay kada buwan kay naa may mo check sa tubig dinhia. Sa ARISP-III na ang nag gunit sa tubig, gi paayo nila ang mga daot- daot sa linya sa sa mga tubo unya naa sad silay gi hire nga tig check sa kondisyon sa tubig. (… When our source of drinking water was still managed by the barangay, the service was not good. When it was managed by ARISP-III, the quality of water that we have been drinking has improved because there is already a person assigned to check our water here. ARISP-III repaired the destroyed pipes and also hired a person to check the condition of the water.) [Story No. SL-72]

4.5.4.3.2 Levels of Changes and Indicators of Potable Water System Project Impacts

To determine the levels of impacts for PWS project of ARISP-III, the themes of the significant changes narrated by the beneficiaries were classified based on Bennett's Hierarchy of Program Evidence (Sutherland & Leech, 2007). Results of the analysis showed that the changes revealed in the two stories correspond the highest level of Bennett's Hierarchy of Program Evidence (i.e., level 7). This suggests that the

PWS project had contributed to the improvement in the conditions of the beneficiaries in the project site. With the improvement of the potable water system in Hingatungan, Silago, the people in the area gained easier access to better quality drinking water.

The reasons why only few stories were told about signficant changes experienced by beneficiaries of the PWS project were revealed during the FGDs. In Hingatungan, some people were saying that the water could not reach the houses located in higher elevations; as such, not many households actually benefitted from the project. In Katipunan, the water supplied by the PWS put up by ARISP-III is not clear and not safe for drinking as verified by the results of the water testing done in a laboratory at the College of Veterinary Medicine in VSU.

In Almeria, Biliran, there were some problems in the management of the project. In Cabucgayan, the water reservoir was destroyed by Typhoon Urduja. Thus, no stories about significant changes were also shared by the ARISP-III beneficiaries.

4.5.4.4 Changes Experienced by the Beneficiaries of the Institutional Development Component

There were 22 MSC stories that were shared by the beneficiaries of the institutional development component of the ARISP-III Project. Results of the broad categorization revealed that the stories of change told by the beneficiaries of the Institutional Development Component of the ARISP-III project belonged to five domains, namely: (1) changes in knowledge, attitude and skills, (2) changes in practice and product or irrigation service quality, (3) economic changes, (4) social changes, and (5) negative changes. The highest number of stories was about changes in knowledge, attitudes and skills (68%) (Table 113).

4.5.4.4.1 Changes in Knowledge, Attitude and Skills

There were 15 stories under the domain on changes in knowledge, attitude and skills (Table 114). Twelve of the stories were shared by beneficiaries from Biliran, and three stories were told by beneficiaries from Southern Leyte. The 15 stories represented five themes or kinds of changes, namely: increase in knowledge about farming (73%), increase in knowledge about financial management, change in attitude towards farming, change in attitude towards information sharing, and change in attitude towards trainings.

Increase in Knowledge About Farming. There were 11 stories about this kind of change. Nine were shared by beneficiaries from Biliran, and two were told by beneficiaries from Southern Leyte. In general, the storytellers were saying that because of the trainings given by the ARISP-III implemeters, they learned better farming techniques or strategies which they applied in their rice farming venture. For them, this change is important because it helped them to increase their yields and be assured that they will have rice for home consumption. For example, according to a farmer beneficiary from Iyusan, Almeria, Biliran:

Table 113. Domains and themes of the most significant change stories shared by the beneficiaries of the institutional development component of the ARISP-III

Domain/Theme	No. of Stories		Total	Percent
	Biliran	So. Leyte		
Changes in knowledge, attitude and skills				
Increase in knowledge about farming	9	2	11	
Increase in knowledge about financial mgt.	-	1	1	
Change in attitude towards farming	1	-	1	
Change in attitude towards info sharing	1	-	1	
Change in attitude towards trainings	1	-	1	
Sub-total	*12*	*13*	*15*	*68.2*
Changes in practice and product quality				
Change in livelihood activity	*1*	-	*1*	*4.5*
Economic changes				
Increase in yield	*1*	*3*	*4*	*18.2*
Social changes				
Strengthened association	-	*1*	*1*	*4.5*
Other changes/negative change				
Stopped attending trainings because it is a waste of time	*1*	-	*1*	*4.5*
Total	15	7	22	100

Usa ko sa officers (secretary) sa Iyusan IA. Makahibawo ko dayon kung naay mga seminar ug training kabahin sa maayong panguma ug uban pa na pagahimuon. Siyempre mo tungha/ apil jud ko kay kana pa nga libre. Daghan ko og naantigohan na mga strategies nga na- apply nako sa ako basakan. Tungod niini, kampante na ko nga masulbad nako og may problema man gani sa pagpananom. Importanteng kausaban gyud ni para nako kay dili nako tantong mamroblema og unsay angay nga aksyon o solusyon nga buhaton para masulbad ang mga niabot na problema sa pag- uma sa basakan. Nadugangan sab ang abot nako sa kada ani. (I was an officer [secretary] of Iyusan IA. I would always know if there are seminars and trainings that will be conducted about good farming and others. I would participate because it is free. I learned many strategies which I was able to apply in my farm. This boosted my confidence to solve problems related to farming. This is an important change for me because I do not find it problematic anymore to identify proper action or solution to my farming problems. My harvest also increased.) [Story No. B-80]

Also, according to a farmer beneficiary from Katipunan, Silago, Southern Leyte:

Dakog kausaban para nako kay pinaagi niini, nakaapil ko og mga trainings kay officer man ko. Nakaabot ko og laing laing mga lugar ug nakakita mi sa mga basak sa laing lugar ug naka atubang og mga lain- laing personalidad. Importante kaayo ni nga pagbag- o kay mas ni lawak ang akong knowledge sa pag- uma kay sa una nga mag basak mi og amo amo lang. Tungod sa trainings, naka realize ko nga dili diay mao among pamaagi sa pagbasak. Naa pa diay mas sakto ug dali nga pamaagi. (The

increase in knowledge about farming was a big change for me. As an officer of this [project], I was able to participate in trainings. I was able to go other places where we see other rice fields and meet different personalities. This is very important because it has widened my knowledge about farming. In the past, we tilled our farms on our own. Because of the trainings, I realized that our usual ways of farming are not all correct – there are better and more appropriate ways.) [Story No. SL-74]

Table 114. Themes and description of the changes narrated by the stories of the beneficiaries of the institutional development component

Domain/Theme	Description	No. of Stories		Total	Percent
		Biliran	So. Leyte		
Increase in knowledge about farming	Because of the trainings, the story tellers said they learned better farming techniques or strategies. To them this change is important because it helped them to increase their yields and be assured that they will have rice for home consumption	9	2	11	73.3
Increase in knowledge about financial mgt.	According to the storyteller, because of the trainings, he learned how to handle the finances of the association. To him, this is important because if they do not know how to do it, the association would fail.	-	1	1	6.7
Change in attitude towards farming	The storyteller said that when he learned about farming strategies through the trainings, he learned to enjoy farming.	1	-	1	6.7
Change in attitude towards info sharing	When he learned new strategies in farming, he realized that it is his responsibility to share what he learned to other farmers	1	-	1	6.7
Change in attitude towards trainings	The storyteller used to ignore trainings because it would take away the time that he would have used to take care of his farm. Later he realized that trainings are useful when you would apply what you learned from there.	1	-	1	6.7
Total		12	13	15	100

Increase in Knowledge About Financial Management. There was only one story about this change which was told by a beneficiary from Hingatungan, Silago, Southern Leyte. He said:

Niapil ko og Training sa Strategic Planning aron mahimo og pamaagi sa pagpalambo sa management ug pinansya nga sistema. Sa wa pa ko ka seminar, wala ko nasayod unsaon pag maintain sa kanal ug unsaon pod pag dumala sa maayong panalapi. Kung dili ka kamao ana, malunod jud ang asosasyon. (I participated in a Training on Strategic Planning to develop strategies in improving the management and financial systemt. Before attending a seminar, I did not know how to maintain an irrigation canal and how to properly manage the finances. If we do not know how to do it, the association would fail.) [Story No. SL-73]

Change in Attitude Towards Farming. There was also only one story about this kind of change, and it was narrated by a beneficiary from Magbangon, Cabucgayan, Biliran. According to him:

Importante sa akoa ni nga project kay kun mayda sakit tak mga humay, nakadto ngan napabulig dayon ako han DA. Natutdo man hira hin mga idea kon anhon pag galam hin kahumayan. Tungod hini nga mga kausaban, maaram na ako hin mga techniques ug nag enjoy na ako pag- uma. (This project is important to me because when my rice plants are infected with diseases, I can go to the people in DA and seek for their help. They teach us about ways to take care of our rice farms. Because of this change, I learned about farming techniques and I now enjoy farming.) [Story No. SL-87]

Change in Attitude Towards Information Sharing. The story about this kind of change was shared by a beneficiary from Tamarindo, Almeria, Biliran. According to him:

Sa akong naagian, nausab ang mga kanal ug libre na ang irigasyon. Pero ang pinaka importante sa ako parte mao ang akong responsibilidad sa pagpa ambit sa ako nakat- onan gikan sa mga seminar ug training ngadto sa mga officer ug miyembro sa IA. Mga kaalam nga nagamit sad nako sa ako basakan hangtod karon. Sa una wala kaayo ko makastorya nga mga tawo pero karon, daghan na kay kinahanglan man. (As I experienced, the canals were improved and the irrigation became free. But the most important change on my part is the realization that it is my responsibility to share what I learned from the seminars and training to the officers and members of the IA. I was also able to use the knowledge in my rice farm until now. Before, I was not able to tell other people, but now [I have already shared to] many because it is needed.) [Story No. B-84]

Change in Attitude Towards Trainings. The story about this change was narrated by a beneficiary from Balaquid, Cabucgayan, Biliran. He used to think that trainings are just a waste of time, but he changed his mind when he attended his first training. According to him:

Dako jud ang nabag- o sa ako panlantaw mahitungod anang mga training-training sukad naka apil ko sa pinaka unang training nako. Maka iban gud unta kini sa oras nako na para unta pag- atiman sa basakan, apan maayo man sad ang resulta

kun magtarong og paminaw ug gamiton sa sakto ang mga nakat- onan sa training. Bisan wala pa mi nahuman sa training, na apply na man nako ang mga natudlo na mga pamaagi aron mas ma- atiman og sakto ang amo humay, ug para nako mas mapalambo pa nako ang nahibaw- an kay desidedo naman ko mo apil og mas daghan pa nga training kay kahibawo nako na para sa kaayohan namong mag- uuma ra man sad ni tanan nga tabang gikan sa gobyerno. (There was a big change on the way that I look at trainings after I attended my first training. I use to think that it was just a waste of time that would have been spent to tend to my rice field. But I found that there is a good result when you just listen attentively and when you use properly what you have learned from the training. Even if we were not done with the trainings yet, I was already able to apply what I learned to properly take care of our rice plants. For me, I can still increase my knowledge because I am now eager to attend more trainings since I now know that the assistance from the government are all for the good of us farmers.) [Story No. B-88]

4.5.4.4.2 Changes in Practice and Product Quality

There was only one story under this domain of change, and this story was about **change in livelihood activity** (Table 115). This was shared by a lady beneficiary from Iyusan, Almeria, Biliran. She narrated that she used to be a housewife tending to her small sari-sari store. After attending trainings organized by ARISP-III she started to engage into farming as well. She said:

… sa una, naa ra jud ko sa balay, mag tinambayon ra, bantay sad sa gamayng tindahan nako. Unya pagka apil nako ani [ARISP-III], nag apil apil dayon ko'g mga training. Sa sige nakog apil apil og training, nagtika-lawom sad ako nahibaw-an anang pag humayan… nakatabang man ni sa akoang panginabuhian. Sa una housewife lang ko, karon farmer na. (… In the past, I only stayed in our house, tending to my little store. When I became involved [in ARISP-III], I immediately participated in the trainings. As I attended the trainings, my knowledge about rice farming deepened…. this has helped my livelihood. Before I was only a housewife, now I am already a farmer.) [Story No. B-92]

4.5.4.4.3 Economic Changes

There were four stories (4) under this domain and all of these were about **increase in yield** as a result of the application of the knowledge they gained from the trainings (Table 115). One of the four stories was shared by a beneficiary from Biliran, and three stories were told by beneficiaries from Southern Leyte. In general, the storytellers were saying that because of their participation in the trainings organized by ARISP-III, their knowledge about farming increased resulting to increase in their rice yields. According to a lady farmer from Tamarindo, Almeria, Biliran:

Tungod sa ARISP-III, pirme ko maka apil og training, usa pa kay opisyal pud ko sa IA. Tungod ana mas nidako akong kaalaman sa pag- uma ug ako gi apply unya nidako akong abot... ang akong abot usa sa nakatabang pagpahuman sa akong anak nga karon seaman na. (Because of ARISP-III, I always join trainings as I was also an officer of the IA. Because of that, my knowledge about farming increased and when I

applied it, my yield increased… my increased yield is one of those that helped my son finish his schooling. He is a seaman now.) [Story No. -93]

Table 115. Themes and descriptions of the other stories narrated by the beneficiaries of the institutional development component

Domain/Theme	Description	No. of Stories		Total	%
		Biliran	So. Leyte		
Changes in practice and product quality					
Change in livelihood activity	According to the storyteller, she used to be a housewife tending to her small sari-sari store. After attending trainings organized by ARISP-III she started to engage into farming also.	*1*	*0*	*1*	*4.5*
Economic changes					
Increase in yield	Because of the trainings, their knowledge in farming increased resulting to increase in rice yield.	*1*	*3*	*4*	*18.2*
Social changes					
Strengthened association	Because of their trainings as officers of their association, they were able to formulate guidelines to follow which resulted to the development of harmonious relationships among officers and to better understanding among association members.	*0*	*1*	*1*	*4.5*
Negative change					
Stopped attending trainings because it is a waste of time	According to the storyteller, he used to attend trainings but he later realized that it was a waste of time so he stopped attending trainings.	*1*	*0*	*1*	*4.5*
Total		15	7	22	100

4.5.4.4.4 Social Changes

There was only one story under this domain, and this was about how the trainings **strengthened the project beneficiaries' irrigation association**. Because of their trainings as officers of their association, they were able to formulate guidelines to follow which resulted to the development of harmonious relationships among officers and better understanding among association members. This was narrated by a beneficiary from Hingatungan, Silago, Southern Leyte. He said:

Para nako ang pinaka importanteng nabag- o kay ang nahitabo karon sa amo asosasyon. Nagka uyon na mi ug nagkasinabtanay na ang mga opisyal ug mga miyembro tungod sa among mga patakaran na gisabutan. Gisunod man sa tanan kay para ra man sad sa amo kaayohan. Ka maayo lamang ani nga resulta kay bisan na kami ra gahimo sa mga patakaran, nilambo man jud mi. Kitaa lang sa mga award amo nadawatan ug ang sitwasyon namo karon na ma control ug ma apod apod na ang tubig sa mga basak na dili na magkasumpaki pa. (For me, the most important change is what is happening in our association. We already have harmonious relationship, and the officers and members already understand each other because of the guidelines that we have agreed. This has been followed by everyone since this is for the good of all. This is a very good result because even if we were the only ones who crafted the guidelines, we have improved so far. You can see this in the awards that we receive and our situation now where we can already control and fairly distribute the water in the rice fields without farmers getting into conflict.) [Story No. SL-79]

4.5.4.4.5 Negative Change

There was one story under this domain, and this was about how the storyteller **stopped attending trainings** because he realized it was just a waste of his time. According to a beneficiary from Balaquid, Cabucgayan, Biliran:

Kaniadto, mo tambong ko og mga training kay sa ako nasabtan, makatabang jud ang mga makat- onan sa training apan nadugay nabantayan man nako na makalangan na man. Usahay maibanan na ang ako oras na dapat igahin unta sa pagbantay o pagsuli- suli sa basakan. Ug usahay dili nako mahuman ang training kay ako huna huna toa sa basakan. Importante man gud unta ang mga training para sa amo nga mga mag- uuma apan wala lamang nako ni magamit sa saktong pamaagi ug wala sad nako ma balanse ang oras sa pagtambong ani ug pag atiman sa basak. (I used to attend trainings because I thought that what we could learn there can help us. But later, I noticed that it would take the time that was supposed to be spent to take care of my rice field. Sometimes, I would not finish the training because of the thinking that I had to be in my farm. Trainings are important for us farmers but I was not able to balance my time between attending trainings and taking care of my farm.) [Story No. B-94]

4.5.4.4.6 Levels of Changes and Indicators of Impacts of the Institutional Development Component

To determine the levels of impacts of the institutional development component of ARISP-III, the themes of the significant changes narrated by the beneficiaries were likewise classified based on Bennett's Hierarchy of Program Evidence (Sutherland & Leech, 2007).

Results of the analysis showed that 21 of the 22 stories (95%) about the changes experienced by those who participated in the trainings organized by ARISP-III were about positive changes that belonged to the higher level of Bennett's Hierarchy of Program Evidence (i.e., levels 5 to 7) (Table 116). This suggests that the institutional development component of ARISP-III was able to contribute to the improvement in

the economic and social conditions of the beneficiaries in Biliran and Southern Leyte. The trainings were able to improve the beneficiaries' knowledge about farming and some aspects of managing an association, which in turn improved their attitudes and practices. Some beneficiaries even experienced increases in yields when they applied what they learned from the trainings. The experience of one beneficiary about trainings as a waste of time, however, is an important eye opener for project implementers to always see to it that project interventions should not compete with the livelihood activities of the beneficiaries.

Table 116. Levels of program outcomes to which the changes experienced by the beneficiaries of the institutional development component of ARISP-III correspond

Level of Outcomes	Theme of Change	Project Sites/ Number of Stories		Total	Percent
		Biliran	So. Leyte		
5 – KASA Changes	Increase in knowledge about farming	9	2	11	
	Increase in knowledge about financial management	0	1	1	
	Change in attitude towards farming	1	0	1	
	Change in attitude towards info sharing	1	0	1	
	Change in attitude towards training	1	0	1	
	Sub-total	*12*	*3*	*15*	*68.18*
6 – Behavioral changes	Change in livelihood activity	1	0	1	
	Sub-total	*1*	*0*	*1*	*4.54*
7 – End results (Changes in the conditions of the program clientele)	Increase in yield	1	3	4	
	Strengthened association	0	1	1	
	Sub-total	*1*	*4*	*5*	*22.73*
Negative change	Stopped attending trainings because it's a waste of time	*1*	*0*	*1*	*4.54*
Total		15	7	22	100

4.5.4.5 Selection of the Most Significant Change Stories

To validate the data that were gathered during the surveys, FGDs and document reviews, seven validation meetings were conducted. These meetings were held in the following places and dates:

1. Kissbone Cove, St. Bernard, So. Leyte on August 14, 2019 – participated in by representatives of the implementers of ARISP-III in Southern Leyte (Department of Agrarian Reform, National Irrigation Administration, DPWH, and LGU San Ricardo).

2. Hingatungan, Silago, Southern Leyte on August 15, 2019 (AM) – participated in by ARISP-III beneficiaries from Hingatungan.

3. Katipunan, Silago, Southern, Leyte on August 15, 2019 (PM) – participated in by ARISP-III beneficiaries from Katipunan.

4. San Ricardo, Southern Leyte on August 16, 2019 – participated in by beneficiaries of the ARISP-III project in San Ricardo.

5. Naval, Biliran on August 19, 2019 – participated in by the ARISP-III implementers in Biliran (DAR, NIA, DPWH and LGUs of Almeria and Cabucgayan).

6. Almeria, Biliran on August 20, 2019 (AM) – participated in by the ARISP-III beneficiaries in Iyusan and neighboring villages.

7. Cabucgayan, Biliran on August 20, 2019 (PM) – participated in by the ARISP-III beneficiaries in Magbangon, Libertad and neighboring villages.

Among the activities during the validation meetings in Silago and Biliran were the presentation of the MSC stories collected during the surveys and the FGDs, and the selection of one story from among the MSC stories presented, which the beneficiaries/project implementers believed to represent the most significant change experienced by the project beneficiaries. Given the limited time and the large number of stories to review, the beneficiaries who attended the validation meeting were asked to select not a specific story but a theme of change which they considered as the most significant among the themes of stories presented.

The ARISP-III beneficiaries in Southern Leyte and Biliran confirmed that the changes described by the survey repondents and the FGD participants were actually happening in their respective places.

When asked which among the MSC stories presented that they considered as the most significant, the project beneficiaries in Hingatungan and Katipunan, Silago; and in Almeria and Cabucgayan, Biliran, chose "**Improvement of the Irrigation System**" as the most significant change among the changes presented. According to the beneficiaries, this change has provided them with sufficient water that enabled them to cultivate their farms more often. It has also increased their yield and income, and most importantly, provided them with more food stocks. The beneficiaries from Katipunan, provided more reasons which include the following: the availability of water passing through the irrigation canals enabled them to engage into additional livelihood activities like pig raising and vegetable farming. Those who were able to raise pigs said they were encouraged to do so because they now have water to clean

the pig pens and the surrounding areas. On the other hand, those who were able to raise vegetables said that they were encouraged to plant vegetables because they now have abundant source of water for their plants. Some women in Katipunan who were beneficiaries of 4Ps also revealed that they were encouraged to go into poultry egg production as their project because of the availability of water which they can use to clean the poultry houses.

Results of this study revealed that the ARISP-III beneficiaries chose the kind of change that enabled them to reap economic benefits including increases in yield, food availability and income, and their ability to engage into additional livelihood activities.

4.6 Net Benefits of the Communal Irrigation Systems/Projects

The ARISP-III introduced several interventions in the project sites that translated to positive impacts. Among the infrastructure projects, irrigation systems attributed more directly to improving productivity and income of the farmers. Changes in productivity and income over time have been quanitified and valued, warranting the estimation of net benefit from the irrigation projects. One limitation of the current evaluation was the lack of detailed quantification and valuation of both direct and indirect impacts of the FMR projects. Unavailability of sufficient data hindered the calculation of net benefits for all investments.

However, benefit-cost analysis was employed to determine worthiness of ARISP-III investments on the irrigation projects. The actual incremental benefits were obtained by getting the difference of net income *before* and *after* rehabilitation of the CIS/CIP. Aside from expressing benefits and costs in their real values, the amounts were also adjusted for the time value of money so that these were expressed in their present values. The present values of costs and benefits were estimated using two rates of interest: 6% (social rate) and 10%.

Table 117 presents the financial indicators for all CIS/CIP across provinces. Results of the benefit-cost analysis show that using a social rate of 6%, the investment of ARISP-III was worthwhile in four out the six CIS/CIP, namely: (1) Upper Iyusan CIS, (2) Balaquid CIS, (3) Hingatungan CIS & Extension, and (4) Katipunan CIS. The highest net present value (NPV) of PhP23.442 million and benefit-cost ratio (BCR) of 1.79 were recorded in the Hingatungan CIS & Extension from Silago, Southern Leyte and Balaquid CIS from Cabucgayan, Biliran, respectively. These two CIS were among the first projects to have been developed (2013 and 2011, respectively). The other irrigation projects were developed in 2014 and 2015.

The Hingatungan CIS covered two IAs: Hingatungan IA and San Isidro IA. The Hingatungan IA was recognized as 2nd Runner Up for Most Outstanding Irrigators' Association in Eastern Visayas in 2015 and 2016. Likewise, it was awarded the 7th Most Outstanding Irrigators' Association in the country during the same periods.

The robustness of the results was greatly affected by the change in interest rate. Increasing the rate of interest rate to 10% reduced the number of CIS/CIP with worthwhile investments to only two. Consistently, the Hingatungan CIS & Extension

and Balaquid CIS projects proved worthwhile investments. On the other hand, the investments in Jamorawon CIS and Cabucgayan CIS from Biliran were not worthwhile.

Table 117. Financial indicators of the communal irrigation systems/projects in Biliran and Southern Leyte

Name and Location of CIS/ CIP	Financial Indicator				
	NPV (in million pesos)		BCR		IRR
	6%	10%	6%	10%	
Upper Iyusan CIP – Almeria, Biliran	4.399	(0.965)	1.33	0.94	9.18%
Jamorawon CIS – Almeria, Biliran	(4.247)	(6.731)	0.58	0.41	1.04%
Balaquid CIS – Cabucgayan, Biliran	3.574	1.533	1.79	1.28	13.39%
Cabucgayan CIS – Cabucgyan, Biliran	(5.323)	(7.874)	0.52	0.36	0.10%
Hingatungan CIS & Extension – Silago, Southern Leyte	23.442	4.697	1.58	1.10	11.19%
Katipunan CIS – Silago, Southern Layte	1.797	(3.928)	1.11	0.77	7.09%

The expected benefits derived from the irrigation projects might not have been fully achieved despite the increased productivity and profitability of the palay farms over time across areas. As the results of technical efficiency analysis indicated, productivity of the palay farms can still be improved.

Results suggest that development projects should also focus on enhancing the access of farmers to better markets by removing barriers and also on enhancing the entrepreneurial skills of the farmers so that the increase in production can be translated to higher increase in net income. One of the goals of ARISP-III is to facilitate marketing of agri-based products through the provision of micro-finance and agricultural extension services through the Agrarian Information and Marketing Center (AIM-C). However, this was not achieved during its implementation because production of agri-based products was quite low and the Federation of Cooperatives in ARCs (FeCARB) was still weak. In 2017, efforts to realize the AIM-C particularly in Biliran was started. Funded with a loan from the Land Bank of the Philippines (LBP), DAR partnered with the Foundation for a Sustainable Society, Inc. (FSSI) and the FeCARB to address the needs of poor farmers in the province by strengthening their participation in local value chains. This can hopefully increase farmers' profitability from palay production.

4.7 Effectiveness of the Sustainability Mechanisms

Several mechanisms were put in place by the project in order to ensure the sustainability of construction/rehabilitation as well as the utilization and maintenance of infrastructure projects. These mechanisms include the preparation and submission of Operation and Management (O&M) Manual especially for communal irrigation sytems/projects (CIS/CIP), a Sub-Project Agreement (SPA) betweeen DAR and

concerned Municipal Local Government Units (MLGUs) for the develpoment of all infrastructure projects, and the conduct of sustainability monitoring and evaluation (SME) by DAR among its various development projects.

O&M Manual. Apart from information on the irrigation system and the respective IAs, the manual presents important documents like certificates of project completion, turn-over and system acceptance. More importantly, it highlights the operation and maintenance policies for the CIS/CIP.

Moreover, the duly signed and attested project completion document certified that a corresponding area of the concerned CIS/CIP "has been successfully completed in accordance with the NIA Engineering Standard and Specification." It further indicates the details of said project facilities that were accomplished. Meanwhile, the duly signed turn-over document certifies that NIA has turned-over the administration, operation and maintenance of the CIS/CIP to the respective IA. In addition, it certifies that the IA can operate and maintain the irrigation system and its facilities. Further, it indicates that NIA will provide technical services when needed in the future by the IA. On the other hand, the duly signed acceptance document certifies that the rehabilitation of a certain area of the CIS/CIP was fully completed, operational, and has been accepted by the IA from NIA. These relevant documents provide assurance that indeed the said ARISP-III project was completed (based on the specified standard), operational and fully accepted by the intended beneficiaries.

Several plans and policies are indicated in the O&M manual. These cover cropping calendar, water distribution and system maintenance. The cropping calendar provides schedule (during wet and dry seasons) of the various farming practices like land soaking, land preparation, seed sowing, transplanting, terminal drainage, and harvesting. However, some deviations in the cropping calendar were observed due to climate change.

Meanwhile, the water distribution policy outlines the rotational schedule of water distribution by sector. This is made possible through the supervision of a water tender per sector. The policy states that non-compliance (for three times within a cropping season) meant forfeiture of one's access to irrigation water during the next cropping season. This policy seems effective because the conflict on the use of water across sites has been reduced.

A system maintenance plan has also been put in place for the irrigation projects. It includes maintenance activities to be done per structure of the CIS/CIP (dam, main canal and steel gate), frequency of maintenance (varies from monthly, quarterly or per cropping) and the responsible person. Penalty for non-compliance is also indicated. Likewise, this mechanism is effective. On the side, regular maintenance activities in the form of clearing and desilting are usually done through *pintakasi* by the members across IAs. However, the irrigation systems across project sites were generally affected by the decreased volume of water from the source, diversion structures and canals damaged by typhoons and landslides. These resulted in insufficient water especially during the dry months. However, the overall observation showed that the existing irrigation systems were still better than before they got rehabilitated.

Assurance for the completion of the other infrastructure projects (*e. g.* farm-to-market road, potable water system and post-harvest facilities) based on approved plans and specifications was also realized with submission of duly signed and attested Project Completion Report (PCR). Only the FMR project in San Ricardo, Southern Leyte was not yet completed due to problems with the contractor. This is the only incomplete project of ARISP-III in Eastern Visayas. The contractor practically abandoned the project and the MLGU decided to take over. Unfortunately, the contractor was (allegedly) overpaid, hence the remaining amount was no longer sufficient to cover the unfinished scope of work. It is only about 83% completed, based on the personal assessment of the DAR Engineer assigned to the project.

There were several variation orders in the project, which resulted in a revised scope of work. The project had a portion that exceeded the allowable slope (per DPWH standards) and a considerable amount of work was done to meet this requirement. Following an additive-deductive scheme in the overall scope of work, the intended concrete-paved length of 3.74 km was reduced to only about 2.80 km and the remainder of the road was only gravel-surfaced. In addition, the portion of the constructed road (about 180-200m in length), which was so poorly constructed, such that the coarse aggregates were already exposed during the construction of the other portions of the road. Despite the DAR Engineer's recommendation to "remove and replace," this structure still remained in its sorry state. In some portions of the road, the concrete pavements were damaged because the road base was weakened by accumulated water that seeped under the ground after heavy rains. Culverts should have been constructed across these segments to drain the accumulated water immediately.

There are also issues with the PWS project. PWS under ARISP-III were intended to provide Level 2 connections only. However, what the beneficiaries needed were connections in every household. The project, however was able to improve the water system by construction of new intake structures and reservoirs as well as rehabilitation of existing lines (using new materials and larger pipes), generally resulting in sufficient potable water to the beneficiaries up to the tap stands. An exception is in one site where the water was no longer potable after some rains due to the location of the intake structure.

Some problems encountered during implementation included the fabrications of connections to the households that actually resulted in insufficient volume of water and low pressure during the dry months and during peak time of use. It was understandable since the designed system was not intended for household connections.

In one site, the reservoir is bypassed because the pressure would significantly drop if the water from the source was stored in it. That is why, it was located in a lower elevation that could provide enough pressure for tap stands use, but not for household connections. What was done here was to connect the main line directly from the source intake structure. With this setup, some pipes got busted as pressure was difficult to regulate, and compounding the problem was the (alleged) poor construction and substandard materials used in the main lines.

In another site, existing reservoirs and pipelines were rehabilitated. Since the volume and pressure of water were sufficient, part of the funds was used to buy hoses to provide water to the households. Thus, some tap stands still existed but the

beneficiaries had availed of the household connections. Some beneficiaries of the project even commented during the FGD that they could even use showers in their bath rooms.

Common management problems existed among PWS beneficiaries. One issue tackled which organization or group should manage the PWS. Under ARISP-III, a peoples' organization (water users association) was established in every site to manage the system after the turnover of the project. However, in most sites, the Barangay Council taking over the project management was considered an option, especially when collection of fees was concerned. Management and the users themselves found it difficult to even determine and agree on the amounts of monthly dues.

In another site, a new water users' association was organized to manage a portion of the service area of an existing water users' organization. The intention was to have a separate PWS since water service of the existing PWS could not reach the area. Unfortunately, just when the project was about to start, water from the supposed source for the new PWS ran out (the source could not provide the designed discharge) and it was agreed to tap the source used by the existing PWS. The project then consisted of two separate PWS sharing a common water source. The existing PWS was rehabilitated (existing old and dilapidated pipes were replaced with larger ones) so that it could provide sufficient potable water (up to the tap stands), to the concerned area under the 2nd organization. After turnover, some beneficiaries were able to obtain direct connections to the households. During the impact assessment, only the first water users' association was managing the PWS.

Another common problem is delayed action on repairs and maintenance. Busted or leaking main pipes or laterals that used to be repaired temporarily (using improvised rubber materials) remain unattended for some time due to the unusually large sizes of the pipes as well as unavailability of materials and trained personnel.

On the other hand, the PHF particularly in Southern Leyte has low utilization rate due to the defective pavement (with cracks and uneven surface that resulted from poor construction) and unestablished prioritization among users. In one site, the palay dried using the poorly constructed solar dryer (pavement) contain several small stones, which may have come from the defective pavement. It was also mentioned during the FGD that management gave undue priority to users in commercial quantities over the small-quantity users even if the latter were members of the association. In another site, the facility served as storage for farm machinery, equipment and supplies.

Sub-Project Agreement. Another sustainability mechanism that was put in place is the Sub-Project Agreement (SPA) between DAR and concerned Municipal Local Government Municipal Units (MLGUs) for the development of all infrastructure projects. The SPA articulates the roles and responsibilities of DAR and the respective MLGUs in the execution of the various projects. Those involved from DAR include the Central Project Management Office (CPMO), Regional Project Management Office (RPMO) and Provincial Project Management Office (PPMO).

One important highlight of the SPA was raising counterpart fund through equity (in kind or in the form of specific sub-projects or scope of work). This served as share of the MLGUs in project development. For irrigation projects, the counterpart

of the MLGUs was in the form of asistance to the IAs in the operation and maintenance of CIS/CIP as well as maintenance and protection of watershed areas. In general, these have been provided by the MLGUs. Tree planting in watershed areas was usually encouraged especially during the celebration of Earth Day.

The MLGUs across sites were able to provide in-kind equity in terms of detailed project design and materials for the construction of PWS. Apart from detailed project design, these MLGUs also provided lot for the post-harvest facilities. The MLGUs were expected to assist the ARBOs in the operation and maintenance of these infrastructure projects.

In general, the counterpart of the MLGUs for the FMR projects was either construction, or improvement/rehabilitation of roads within the municipality. This has been successful in Biliran but unfortunately not realized for all FMR projects from the municipalities of Silago and San Ricardo in Southern Leyte. The primary reason for non-compliance to this particular agreement was lack of funds. These MLGUs provided assurance to look for funds in order to materialize the projects.

Sustainability Monitoring and Evaluation. A more recent sustainability mechanism implemented by DAR is the conduct of sustainability monitoring and evaluation (SME) among its various development projects. The agency conducted SME three years after completion of projects. The ARISP-III projects were included in the SME starting 2019. The SME is conducted by an Inspectorate Team composed of the Provincial Agrarian Reform Program Officer (PARFO), Chief Agrarian Reform Program Officer – Beneficiaries Development and Coordination Division (CARPO BDCD), Rural Infrastructure Engineer (RIE), Institutional Development Coordinator (IDC), and Provincial Agrarian Reform Coordinating Committee (PARCOM) representative. The team provided report stating both numerical and qualitative ratings to the monitored projects as well as observations and recommendations.

4.8 Innovative Approaches in Project Implementation and Lessorns Learned

4.8.1 Innovative Approaches and Strategies to Project Implementation

The ARISP-III is a development initiative that adopted some approaches and strategies which contributed to its relatively successful implementation. It is an integrated development project that engaged inter-agency partnership/collaboration, promoted raising of counterpart funds and use of technical assistance partner institutions/individuals.

DAR, which is the lead implementing agency, partnered with related agencies/ institutions. It collaborated with NIA for the irrigation projects and DPWH for farm-to-market road projects. Moreover, it partnered with MLGUs for the infrastructure projects (including potable water system and post-harvest facilties) and for the Agriculture and Agribusiness Development (AAD) component. The partnership provided not only technical support but also additional resources for the development of said infrastructure projects.

The implementing agencies also developed the sub-project proposals (including details of program of work and specifications as well as budget). However, the proposals needed review and approval by the DAR CPMO and since processing took time, this caused delay in project implementation. There were times that the approved budget for the proposed projects was reduced. In the case of the FMR project in San Ricardo, the reduction in budget resulted to failure in bidding twice. This further caused delay in project development.

Another significant strategy employed by ARISP-III implementation is the promotion and raising of counterpart funds especially among LGU partners. This was in the form of equity in-kind or scope of work of specific sub-projects like securing right-of-way (particularly for CIS/CIP and FMR) and lot (for PHF), complementary sub-projects (for FMR), operation/ repair and maintenance of infrastructure projects as well as watershed management in support for the CIS/CIP. Aside from mobilization of resources, this strategy ensured completion of almost all the sub-projects and provided concerned LGUs opportunity to sustain support to the ARBO-recipients beyond project completion/phase-out.

The employment of a TAPI was another strategy that proved effective in terms of knowledge transfer. Sustainability in practicing what had been taught and learned from TAPI is very important. However, this was not achieved in a few ARBOs due to the turnover of officers and their failure to mentor younger members to do the responsibility especially the financial management practices. Follow-up trainings and other forms of capability building is needed to train younger generations to do the management tasks.

4.8.2 Lessons Learned

In general, the implementation of ARISP-III was successful. However, some lessons can be generated that would guide the implementation of similar future development projects.

1. Delay in the approval of detailed design (particularly FMR projects in Southern Leyte) due to time consuming detailed design preparation, slow completion of the revised detailed design after each review by CPMO at the provincial DPWH level and revision of the approved program of work (POW) caused delay in project implementation. Timeline must be provided and strictly implemented in accomplishing the revised project designs for speedy approval.

2. Reduction in the proposed budget for infrastructure projects further caused delay due to failure in bidding (particularly for the FMR project in San Ricardo, Southern Leyte). Contractors were discouraged by the lower approved budget for the said project. This problem can be avoided by establishing a price baseline from the Department of Trade and Industry that will be used as reference for costing. Prices of construction materials vary from one place to another, hence the current prices applicable to a certain locality must be adopted.

3. The FMR project in San Ricardo, Southern Leyte was abandoned by the contractor, hence remained incomplete until the time of impact evaluation. In addition, cracks, potholes and scaling on many portions of the constructed road was observed. This implies poor quality of work and deviation from standards. The initiative of the incumbent Municipal Mayor was commendable in taking over some portions of the unfinished project and doing the required repair on the cracks, potholes and scaling that could prevent further damages/deterioration.

   Regular monitoring by the implementing agencies (both DAR and DPWH) during project implementation could have been useful in detecting and possibly avoiding above-mentioned problems. However, the lack of manpower and relatively far distance of some project sites hindered the concerned agencies from doing so. In general, the provincial DAR offices which were responsible in the monitoring and evaluation of the sub-project construction were undermanned for the purpose. Installing a project implementing structure in each CARP implementing agency with complete staffing with delineated functions is deemed valuable. This can fast track project implementation and provide focus to the assigned technical staff.

4. Capacity-building activities were conducted alongside with infrastructure development. This generally helped develop the capability of officers and members in managing and sustaining their respective ARBOs as well as the infrastructure projects provided by the project. Training of second-line leaders for the beneficiary organizations can be valuable to sustain good management practices.

5. The design of FMR projects usually does not cater to heavy vehicles. But the construction of FMR project opens transportation opportunity not only to light but also to heavy vehicles to the sites. The latter haul not only farm inputs and products but also construction materials (for permanent houses and buildings) which can affect the lifespan of said projects. There is a need to review the standards for FMR.

6. In the AAD component, the choice of enterprise to recommend to the primary cooperatives is important. Situational analysis that can provide supply and demand information can help identify suitable enterprises. Sending the cooperative members and officers to many trainings on various investment opportunities can only spread their and government resources too thinly and results to lack of focus and failure. Training them on what is suitable to their situation and gain competitive advantage will help reduce cost and prevent wastage of cooperative and government resources. Although diverisifcation is important for growth and financial sustainability, strengthening one enterprise before venturing to another can help reduce the probability of failure.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

Evaluating the relationship between rural infrastructure and improvement in welfare among small-scale rice farmers is complex in nature. The potential of increasing rural productivity and profitability through improved rural infrastructure such as irrigation system, farm-to-market road and postharvest facilities is substantial. These infrastructure projects are among the interventions provided by the ARISP-III in the provinces of Biliran and Southern Leyte.

This study sought to evaluate the impact of ARISP-III interventions primarily on productivity and profitability of rice farmers across provinces using innovative quantitative approaches in addressing the questions of causality. Moreover, it employed qualitative techniques in further determining impacts. Considering the results of the study, the following conclusions and recommendations are drawn.

5.1 Conclusion

As an integrated development project, the ARISP-III has been generally successful in achieving its objectives. The interventions of the project in improving the irrigation systems of the beneficiary communities and in enhancing their technical capacities have led to the improvement in the farming conditions, as well as the economic and social conditions of a great majority of the beneficiaries. Moreover, the improvement in the irrigation systems caused an increase in cropping intensity, productivity of the rice farms and profitability of farmer-beneficiaries. It has also reduced conflict in the use of irrigation water. Among the ARISP-III components, the improvement of the irrigation systems is considered by the beneficiaries as the most significant change as it enabled them to reap both economic and social benefits.

Similarly, the other infrastructure projects have provided positive benefits to the beneficiaries. The farm-to-market road project has improved the efficiency of commodity flow and mobility of people. Apart from reducing the travel time and increasing the mobility of people, the FMR has also improved access to services and additional livelihood opportunities. Furthermore, the water system project has generally provided better access to and availability of potable water supply in the communities. It has significantly reduced time in fetching water. Meanwhile, the availability of properly constructed postharvest facilities significantly expanded the palay trading of most primary cooperatives. It also provided opportunities for diversification of agribusiness enterprises.

The ARISP-III was able to organize and strengthen people's organizations in the project sites as well as improved the entrepreneurial competencies especially of the primary cooperatives. This has led to increased patronage of members to their respective ARBOs and improved the financial performance and status of the primary cooperatives. However, sustainability was not developed in all of the beneficiary ARBOs. Meanwhile, the project has facilitated the development of additional agribusiness enterprises. However, only few of the developed agribusiness enterprises were sustainable. The sustainability of agribusiness activities has been affected by occurrence of calamities and choice of enterprises.

The ARISP-III has employed relatively effective sustainability mechanisms that facilitated the construction/rehabilitation, utilization and maintenance of infrastructure projects. It has also adopted some innovative approaches that contributed to its relatively successful implementation.

5.2 Recommendations

To further improve and sustain the gains and benefits from the implementation of the ARISP-III, regular monitoring and continuous improvement among beneficiaries are needed. Some lessons learned from the ARISP-III can also serve as guide in the implementation of future similar development projects. Specifically, the following recommendations are provided:

(a) The Department of Agrarian Reform, in cooperation with the concerned MLGUs should continuously provide capability-building activities in order to improve farmers' technical efficiency and entrepreneurial skills. Promotion of the use of hybrid seeds can further improve productivity of rice farms. In addition, the creation of Agrarian Information and Marketing Centers across provinces to help farmers on matters related to the marketing of their farm produce must be supported. Moreover, it is recommended that the National Irrigation Administration lead in the immediate rehabilitation of the damaged portions of the Jamorawon CIS due to Typhoon Urduja in Biliran. The Irrigators Associations should also perform regular repair and maintenance of the various CIS/CIP. Furthermose, DAR, NIA, MLGUs, and IAs should continuously engage in activities to maintain and protect the watershed areas in the project sites.

(b) The Department of Public Works and Highways needs to review the standards for FMR in terms of width and thickness to provide better and more lasting infrastructure to the people in the communities. Together with the MLGU, the DPWH should complete the construction of the FMR project in San Ricardo. In addition, compliance of MLGUs in Silago and San Ricardo to their equity in-kind of constructing/rehabilitating roads of the same scope as provided by the ARISP-III must be sought. Moreover, the concerned MLGUs across project sites are encouraged to conduct regular repair and maintenance of the FMRs.

(c) Regular monitoring by DAR and the MLGUs of the various water systems and the Water Users' Associations (WUAs) is recommended. The WUAs should be guided in collecting commensurate user fee and engaging in proper maintenance of the water facilities (especially immediate repair of busted/leaking pipes).

(d) Similar to the PWS, there is a need for proper maintenance of the postharvest facilities by the concerned ARBOs. Repair of the defective drying facility in Hingatungan is also recommended. The MLGU can support the primary cooperative in this endeavor.

(e) It is also recommended that DAR and the concerned MLGUs should institute mechanisms for the regular monitoring of the ARBOs to ensure that the recommended management practices that they have started to integrate into their operations will be continuously employed. Moreover, it is recommended for DAR and DA-LGU to conduct situational analysis as basis in choosing the enterprise to develop. Monitoring of the actual farm operations must be done to ensure that farmer beneficiaries are following recommended farm practices.

(f) The interventions provided by the ARISP-III can be replicated in other sites, incorporating the lessons learned in its implementation and innovative approaches employed.

CHAPTER VI

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ANNEXES

Annex 1. The Project Evaluation Team

Role	Name	Education	Specialization
Team Leader	Fe M. Gabunada	PhD in Agricultural Economics	Production Economics; Impact Evaluation
Asst. Team Leader	Moises Neil V. Seriño	PhD in Economics	Econometrics; Development Economics
Technical Expert	Nilda T. Amestoso	Doctor in Business Administration	Agribusiness Management; Project Feasibility Studies
	Editha G. Cagasan	PhD in Development Communication	Development Journalism; Participatory M&E
	Remberto A. Patindol	PhD in Statistics	Statistics; Agricultural Engineering
Research Assistant	Lendelle Editha G. Cagasan	BS in Economics	Economics
	Angenette R. Jugan	BS in Development Communication	Development Communication

Annex 2. Questionnaire for Farmer-Respondents

CONFIDENTIALITY: The Interviewer takes the responsibility in guarding the confidentiality of all the information generated through this instrument.	**Impact Evaluation of the Agrarian Reform Infrastructure Support Project – Phase III (ARISP III) in Eastern Visayas**

ID:		Enumerator:	Supervisor:
DATE:		Name and Signature	Name and Signature

I am _____, a researcher from the Visayas State University (VSU) in Baybay City, Leyte. Our research team has been commissioned by NEDA Regional Office VIII to evaluate the Agrarian Reform Infrastructure Support Project – Phase III (ARISP-III) which was implemented by the Department of Agrarian Reform in your area. Your household has been randomly selected as respondent to represent the (ARISP-III beneficiaries or non-beneficiaries). The information that will be obtained from this survey will provide insights on the outcomes and impacts of the project and will guide the policy makers in scaling up or approving future similar development project. Rest assured that all information will be kept confidential and will be used for research purposes only.

Standard Codes:	0 = No	1 = Yes	-66 = No Response
-77 = Do not know	-88 = none	-99 = Not Applicable	

SECTION I. RESPONDENT'S INFORMATION

1. Type of Respondent : [0 – Non-beneficiary; 1- Beneficiary [ ]
2. MSC Code : [0 – No; 1 – Yes] [ ]
3. Household Address

3.1 Purok/Sitio : _____

3.2 Barangay : _____

3.3 Municipality : _____

3.4 Province : _____

4. Name of Respondent

4.1 First Name : _____

4.2 Middle Name : _____

4.3 Last Name : _____

5. Age : _____
6. Gender : _____ (1 – Male; 2 – Female)
7. Civil Status : _____ (1 – Single; 2 – Married; 3 – Widowed; 4 – Separated/Divorce; 5 – Live-in)
8. Number of years in school : _____ (please refer to code for Education (18) found on page 2 on the household profile table)
9. Contact Number : _____
10. Household Size : _____
11. Number of Children : _____
12. Number of other HH member : _____

SECTION II. HOUSEHOLD CHARACTERISTICS

2.1 Household Profile

13	14	15	16	17	18	19	20	21	22
Who are the members of this household? (list in this order) Family Name, First Name	RELATIONSHIP TO HOUSEHOLD HEAD	AGE	SEX	CIVIL STATUS ENTER CODE 1 - Single 2 - Married 3 - Widowed 4 - Separated/ Divorce 5 - Live-in	EDUCATION	Presently Attending School? ENTER CODE 1 - Yes 2 - No	Type of School ENTER CODE 1 - Public 2 - Private	OCCUPATION	
								PRIMARY	SECONDARY
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
10.									

Codes to Relationship to HH (14)

0- Non Relative
1- Head
2- Spouse
3- Son
4- Daughter
5- Stepson
6- Step Daughter
7- Son-in-Law
8- Daughter-in-Law
9- Grandson
10- Granddaughter
11- Father
12- Mother
13- Brother
14- Sister
15- Uncle
16- Aunt
17- Nephew
18- Niece
19- Other Relative

Codes to Sex (16)
1 – Male
2 – Female

Codes for Education (18)

0- No Grade Completed
1- Pre-School

Elementary
2- Grade 1
3- Grade 2
4- Grade 3
5- Grade 4
6- Grade 5
7- Grade 6

High School
8- Grade 7 (1st Year)
9- Grade 8 (2nd Year)
10- Grade 9 (3rd Year)
11- Grade 10 (4th Year)
12- Grade 11
13-Grade 12

14- Vocational College
15- First Year
16- Second Year
17- Third Year
18- Fourth Year
19- College Grad
20-Post Grad

Codes for Occupation (21/22)

0- None
1- Farmer
2- Housewife/Housekeeper
3- Agricultural Worker
4- Labor, production and related worker
5- Service Worker
6- Sales Worker
7- Professional
8- Brgy. Officials/ Brgy. Worker
9- Self-employed/Own Business
96. Others (specify) _____

23	24	25	26
Code	Expenditure item	Average Amount in a given period (PhP)	Period
1	Food (kunsumo sa pagkaon)		In a week
2	Clothing (nagasto sa pangsinena sa mi-aging tuig)		In a year
3	Utilities (Electricity, signal, etc)		In a month
4	Water bills		
5	Household Facilities (Repair, maintenance, etc)		In a year
6	Non-food Items (Toiletries, soap, shampoo, toothpaste, etc.)		In a month
7	Health expenses (Medicine, hospital fees, etc)		In a year
8	Transportation (gasoline/ plete)		In a month
9	Communication (cellphone loads, telephone bills, etc.)		In a month
10	Recreation (Liquors, cigarettes, gambling, etc)		In a month
11	Education (Including tuition, books, allowance, transportation, etc)		In a semester
12	Special Occasions (birthdays, Christmas, New Year)		In a year
13	Other expenses please specify._____		

2.3 Income and Employment Profile

27	28
Sources of Income	Estimated Income per year
	Earnings/ Income
	2017
Farm Income	
Rice	
Vegetables	
Root crops	
Livestock and Poultry	
Coconut	
Others (specify)	
Total	
Off-farm Income	
Planting	
Plowing	
Weeding	
Other, specify _____	
Total	
Non-farm Income	
Salaries and wages	
Sari-sari store/Business	
Total	
Other sources:	
Remittance received (Domestic & Foreign)	
Pension, retirement & other similar benefits	
4Ps	
Other(s), specify _____	
Total	
GRAND TOTAL	

2.4 Information on dwelling place

29	30	31	32	33	34
Period	House ownership	Toilet Facility	Source of Water supply	Uses of water	Distance from the house of the water source (meter)
Before (2009)					
Now					

Code for house ownership (30) 1- Owned 2 – Rented 3- Living with others 4- Others, (specify)_____	Codes for toilet facility (31) 1- Flush 2- Pour 3- Antipolo type 4- None 5- Others (specify)_____	Codes for source of water supply (32) 1-Private water connection/piped-in 2-Water pipes/tanks provided by the government and other groups (including ARISP III) 3-Refilling Station 4-Mineral Water from Stores 5-Spring Water (Tubod) 6-Rain Water 7-Well water (Tabay)	Codes for uses of water (33) 1- Drinking only 2- Cooking only 3- Domestic used only 4- Drinking & Cooking 5- Drinking, cooking, and domestic used

SECTION III. LAND OWNERSHIP AND USE OF LAND

3.1 Parcel Information

35	36	37	38	39	40	41	42
Parcel No.	Period	Cultivated Area (ha)	Tenure	Year Tenure was acquired	Use of land parcel	Frequency of planting per year Only for rice parcels	Where is the parcel located in relation to the irrigation canal? Only for rice parcels
1	Before (2009)						
2	Before (2009)						
3	Before (2009)						
4	Before (2009)						
1	2017						
2	2017						
3	2017						
4	2017						

Codes for Tenure (38) 1 Owner Cultivator*(Tag-iya og nag tikad sa yuta)* 2 Share Tenant*(Saop)* 3 Leaseholder*(Nag-abang)* 4 Amortizing Owner*(Tag-iya sa yuta nga nagpadayon pa ug bayad)* 5 Claimant cultivator*(Nag tikad sa yuta nga gusto mo angkon sa yuta)* 6 Farm worker/Farm laborer *(Nagtrabaho sa luna)* 7 Mortgagee *(Giprindahan sa yuta)* 8 Free access/use 9 Others (specify)	Codes for Use of land parcel (40) 1 Rice Paddy 2 Use for growing vegetable 3 Use for growing coconut trees 4 Lease to other farmer 5 Fallowed (wala usa gamita) 6 Lease it to an agricultural enterprise 7 Lease it to whoever will pay the most 8 Lease it to private family farm 9 Give it away or exchange it for a different parcel 10 Don't know 11 Others (specify)	Codes for parcel location (42) 1 Upstream (duol sa irrigation source) 2 Midstream (tunga) 3 Downstream (ubos; layo sa irrigation source)

3.2 Irrigation (Last Dry Cropping Season) *[Only for parcels devoted to rice production.]*

43	44	45	46	47		48	49		50	51	52	53	54	55	56	57	58					
Parcel No.	Period	What is the primary source of irrigation water for this parcel?	Which was the primary means of irrigating the parcel?	What is the distance from the source to the parcel, following along the canal?		How many times did you irrigate this parcel during the Dry season?	For how many months was the water distribution system continuous or rotational in this season?		If ROTATIO-NAL, how many days per week did you have access?	If ROTATIO-NAL, for each day that you have access, how many hours per day did you have access?	What was the total amount paid to use this? (PHP) * (If in-kind payment, convert to PHP using prices for this season)	Was there sufficient water in the irrigation system of this parcel in this season? 0=NO (ANSWER 53) 1=YES (GO TO 57)	If NO, did you use any other sources of water for rice in this parcel in this season? 0=NO (GO TO 57) 1=YES	If YES, what was the second most important source of water for this parcel in this season?	Which was the secondary means of irrigating the parcel?	What was the total amount paid to use this? (PHP) * (If in-kind payment, convert to PHP using prices for this season)	If you are planting rice, to what depth was the parcel flooded? UNIT CODES 1=CENTIMETERS 2=INCHES					
																	Land Preparation Stage (including ploughing and transplanting)		Growing stage		Flowering Stage	
				Distance	Unit		Continuous	Rotational									Qty	unit	Qty	unit	Qty	unit
1	Before (2009)																					
2	Before (2009)																					
3	Before (2009)																					
4	Before (2009)																					
1	2017																					
2	2017																					
3	2017																					
4	2017																					

Note: * This refers to the seasonal fee paid to the IA for the water and the irrigation facility (e.g. pump), excluding the price of fuel.

Codes for primary source of irrigation water (45)	Codes for primary means of irrigating the parcel (46)	Answer codes for units (47)	Codes for 2nd most important source of water (55)	Codes for secondary means of irrigating the parcel (56)
1=IRRIGATION (EARTHEN CANAL) 2=IRRIGATION (CONCRETE CANAL) 3=POND/LAKE (PIPE/DRIP) 4=BORE WELL (TUBE WELL) 5=DUG WELL 6=NONE/RAINFED (Proceed to q.58 7=OTHER, SPECIFY	1=HAND PUMP 2=ELECTRIC PUMP 3=MOTOR-PUMP 4=GRAVITY 5=NONE 6=OTHER, SPECIFY	1=KM 2=METRES	1=IRRIGATION (EARTHEN CANAL) 2=IRRIGATION (CONCRETE CANAL) 3=POND/LAKE (PIPE/DRIP) 4=BORE WELL 5=DUG WELL 6=NONE/RAINFED 7=OTHER, SPECIFY	1=HAND PUMP 2=ELECTRIC PUMP 3=MOTOR-PUMP 4=NONE 5=GRAVITY 6=OTHER, SPECIFY

3.3 Irrigation (Last Wet Cropping Season) *[Only for parcels devoted to rice production.]*

59	60	61	62	63		64	65		66	67	68	69	70	71	72	73	74					
Parcel No.	Period	What is the primary source of irrigation water for this parcel?	Which was the primary means of irrigating the parcel?	What is the distance from the source to the parcel, following along the canal?		How many times did you irrigate this parcel during the Dry season?	For how many months was the water distribution system continuous or rotational in this season?		If ROTATIO-NAL, how many days per week did you have access?	If ROTATIO-NAL, for each day that you have access, how many hours per day did you have access?	What was the total amount paid to use this? (PHP) * (If in-kind payment, convert to PHP using prices for this season)	Was there sufficient water in the irrigation system of this parcel in this season? 0=NO (ANSWER 53) 1=YES (GO TO 57)	If NO, did you use any other sources of water for rice in this parcel in this season? 0=NO (GO TO 57) 1=YES	If YES, what was the second most important source of water for this parcel in this season?	Which was the secondary means of irrigating the parcel?	What was the total amount paid to use this? (PHP) * (If in-kind payment, convert to PHP using prices for this season)	If you are planting rice, to what depth was the parcel flooded? UNIT CODES 1=CENTIMETERS 2=INCHES					
				Distance	Unit		Continuous	Rotational									Land Preparation Stage (including ploughing and transplanting)		Growing stage		Flowering Stage	
																	Qty	unit	Qty	unit	Qty	unit
1	Before (2009)																					
2	Before (2009)																					
3	Before (2009)																					
4	Before (2009)																					
1	2017																					
2	2017																					
3	2017																					
4	2017																					

Note: * This refers to the seasonal fee paid to the IA for the water and the irrigation facility (e.g. pump), excluding the price of fuel.

Codes for primary source of irrigation water (45)	Codes for primary means of irrigating the parcel (46)	Answer codes for units (47)	Codes for 2nd most important source of water (55)	Codes for secondary means of irrigating the parcel (56)
1=IRRIGATION (EARTHEN CANAL) 2=IRRIGATION (CONCRETE CANAL) 3=POND/LAKE (PIPE/DRIP) 4=BORE WELL (TUBE WELL) 5=DUG WELL 6=NONE/RAINFED (Proceed to q.58 7=OTHER, SPECIFY	1=HAND PUMP 2=ELECTRIC PUMP 3=MOTOR-PUMP 4=GRAVITY 5=NONE 6=OTHER, SPECIFY	1=KM 2=METRES	1=IRRIGATION (EARTHEN CANAL) 2=IRRIGATION (CONCRETE CANAL) 3=POND/LAKE (PIPE/DRIP) 4=BORE WELL 5=DUG WELL 6=NONE/RAINFED 7=OTHER, SPECIFY	1=HAND PUMP 2=ELECTRIC PUMP 3=MOTOR-PUMP 4=NONE 5=GRAVITY 6=OTHER, SPECIFY

SECTION IV. FARMING PRACTICES

75. Number of years in general farming : _____
76. Number of years in rice farming : _____
77. Total farm area (ha) (sum of parcel) : _____
78. Total area planted to rice (ha) : _____

4.1 Planting Practices *[For the largest parcel devoted to rice.]*

4.1.1 Dry Cropping Season (Area of the largest parcel: _____ ha.)

79	80	81	82	83	84	85	86
What is the main type of seed/seed-ling that was planted ? (Variety) [Use code below]	What was the source of the seed/ seedlings? [Use code below]	What was the method employed in planting RICE seeds?	How old were the seed-lings at the time of planting ? (No. days)	If DIRECT SEEDING or TRANSPLAN-TED, how many SEEDS/seed-lings were planted per hill? [IF THERE IS A RANGE GIVEN (E.G 2-3), THE MAXIMUM AMOUNT SHOULD BE ENTERED]	If DIRECT SEEDING WITH PRE-GERMIN ATION or TRANSPL ANTED, were the seedlings in line? [Use code below] 0=NO 1=YES	If TRANS-PLANTED , what was the planting distance ? [Use code below]	Do you use any water saving technologies/tech niques on this parcel (including alternate/ intermittent wetting and drying)? [Use code below] 0=NO 1=YES [f yes, provide details]: _____ _____ _____ ___
Before:							
Now:							

Codes for main type of seedling (79/87):	Codes for source of seedling (80/88):	Codes for method employed (81/89):	Codes for planting distance (86/93):
1= Traditional 2= Certified/Registered (This includes in-bred and non-hybrid varieties) 3= Hybrid 4= Others, specify:	1= Saved from own harvest 2= Purchased from private seller 3= Purchased from government/DA 4= Others, specify	1= Direct seeding with pre-germination (Answer 81-83/89-91, then skip to 85/93) 2= Transplanting 3= Broadcasting dry (Skip to q. 85/93) 4= Broadcasting with pre-germination (Skip to q. 85/93) 5= Other, specify (Skip to q.85/93)	1= 10cm x 10cm (3.9in x 3.9 in) 2=15cm x 15cm (5.9in x 5.9in) 3=20cm x 20cm (7.9in x 7.9in) 4=OTHER, SPECIFY

4.1.2 Wet Cropping Season (Area of the largest parcel: _____ ha.)

87	88	89	90	91	92	93	94
What is the main type of seed/seed-ling that was planted? (Variety) [Use code below]	What was the source of the seed/ seedlings? [Use code below]	What was the method employed in planting RICE seeds?	How old were the seed-lings at the time of planting? (No. days)	If DIRECT SEEDING or TRANSPLAN-TED, how many SEEDS/seed-lings were planted per hill? [IF THERE IS A RANGE GIVEN (E.G 2-3), THE MAXIMUM AMOUNT SHOULD BE ENTERED]	If DIRECT SEEDING WITH PRE-GERMINATION or TRANSPLANTED, were the seedlings in line? [Use code below] 0=NO 1=YES	If TRANS-PLANTED, what was the planting distance? [Use code below]	Do you use any water saving technologies/techniques on this parcel (including alternate/ intermittent wetting and drying)? [Use code below] 0=NO 1=YES [f yes, provide details]: _____ _____ __
Before:							
Now:							

Codes for main type of seedling (79/87): 1= Traditional 2= Certified/Registered (This includes in-bred and non-hybrid varieties) 3= Hybrid 4= Others, specify:	Codes for source of seedling (80/88): 1= Saved from own harvest 2= Purchased from private seller 3= Purchased from government/DA 4= Others, specify	Codes for method employed (81/89): 1= Direct seeding with pre-germination (Answer 81-83/89-91, then skip to 85/93) 2= Transplanting 3= Broadcasting dry (Skip to q. 85/93) 4= Broadcasting with pre-germination (Skip to q. 85/93) 5= Other, specify (Skip to q.85/93)	Codes for planting distance (86/93): 1= 10cm x 10cm (3.9in x 3.9 in) 2=15cm x 15cm (5.9in x 5.9in) 3=20cm x 20cm (7.9in x 7.9in) 4=OTHER, SPECIFY

4.2 Farm Input Expenditures *[Using the same largest parcel.]* _____ ha.

4.2.1a Material Inputs for Rice Production, Before (Dry Cropping Season)

95	96	97	98	99
Material Inputs	2017			
	Unit	Qty/ unit	Price/ unit (PhP)	Total Cost (PhP)
Seeds				
Organic Fertilizers				
Chicken dung				
Vermicast				
Compost				
Commercial organic fertilizer				
Other (specify: _____)				
In-Organic Fertilizers				
Complete (14-14-14)				
Urea (46-0-0)				
Ammonium Phosphate (16-20-0)				
Ammonium Sulfate (21-0-0)				
Other (specify: _____)				
Foliar Fertilizers (specify: _____)				

Table 4.2.1a, continued. . . (Material inputs, before, dry cropping season)

95	96	97	98	99
Material Inputs	2017			
	Unit	Qty/ unit	Price/ unit (PhP)	Total Cost (PhP)
Herbicides (specify: _____)				
Molluscicide (specify: _____)				
Pesticides (specify: _____)				
Rodenticides				
Fuel and oil				
Food expense				
Sacks and tying materials				
Repair and maintenance				
Land Tax				
Rentals: (land, machine, animal, tools and equipment)				
Transportation cost (inputs and farm produce)				
Interest payment on crop loan				
Depreciation cost (to be computed)				
Other (specify: _____)				

4.2.1b Material Inputs for Rice Production, Now (Dry Cropping Season)

95	96	97	98	99
Material Inputs	2017			
	Unit	Qty/ unit	Price/ unit (PhP)	Total Cost (PhP)
Seeds				
Organic Fertilizers				
Chicken dung				
Vermicast				
Compost				
Commercial organic fertilizer				
Other (specify: _____)				
In-Organic Fertilizers				
Complete (14-14-14)				
Urea (46-0-0)				
Ammonium Phosphate (16-20-0)				
Ammonium Sulfate (21-0-0)				
Other (specify: _____)				
Foliar Fertilizers (specify: _____)				
Herbicides (specify: _____)				
Molluscicide (specify: _____)				
Pesticides (specify: _____)				
Rodenticides				
Fuel and oil				
Food expense				
Sacks and tying materials				
Repair and maintenance				

Table 4.2.1b, continued. . . (Material inputs, now, dry cropping season)

95	96	97	98	99
Material Inputs	2017			
	Unit	Qty/ unit	Price/ unit (PhP)	Total Cost (PhP)
Land Tax				
Rentals: (land, machine, animal, tools and equipment)				
Transportation cost (inputs and farm produce)				
Interest payment on crop loan				
Depreciation cost (to be computed)				
Other (specify: _____)				

4.2.2a Material Inputs for Rice Production, Before (Wet Cropping Season)

100	101	102	103	104
Material Inputs	2017			
	Unit	Qty/ unit	Price/ unit (PhP)	Total Cost (PhP)
Seeds				
Organic Fertilizers				
Chicken dung				
Vermicast				
Compost				
Commercial organic fertilizer				
Other (specify: _____)				
In-Organic Fertilizers				
Complete (14-14-14)				
Urea (46-0-0)				
Ammonium Phosphate (16-20-0)				
Ammonium Sulfate (21-0-0)				
Other (specify: _____)				
Foliar Fertilizers (specify: _____)				
Herbicides (specify: _____)				
Molluscicide (specify: _____)				
Pesticides (specify: _____)				
Rodenticides				
Fuel and oil				
Food expense				
Sacks and tying materials				
Repair and maintenance				
Land Tax				
Rentals: (land, machine, animal, tools and equipment)				
Transportation cost (inputs and farm produce)				
Interest payment on crop loan				
Depreciation cost (to be computed)				
Other (specify: _____)				

4.2.2b Material Inputs for Rice Production, Now (Wet Cropping Season)

100	101	102	103	104
Material Inputs	2017			
	Unit	Qty/ unit	Price/ unit (PhP)	Total Cost (PhP)
Seeds				
Organic Fertilizers				
Chicken dung				
Vermicast				
Compost				
Commercial organic fertilizer				
Other (specify: _____)				
In-Organic Fertilizers				
Complete (14-14-14)				
Urea (46-0-0)				
Ammonium Phosphate (16-20-0)				
Ammonium Sulfate (21-0-0)				
Other (specify: _____)				
Foliar Fertilizers (specify: _____)				
Herbicides (specify: _____)				
Molluscicide (specify: _____)				
Pesticides (specify: _____)				
Rodenticides				
Fuel and oil				
Food expense				
Sacks and tying materials				
Repair and maintenance				
Land Tax				
Rentals: (land, machine, animal, tools and equipment)				
Transportation cost (inputs and farm produce)				
Interest payment on crop loan				
Depreciation cost (to be computed)				
Other (specify: _____)				

4.2.3a Labor Inputs for Rice Production, Before (Dry Cropping Season)

105	106	107	108	109	110	111
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Seedbed Preparation *(Pag andam sa saboran/taguran)*	MD					
Land Preparation *(Pag andam sa tamnanan)*						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					
Irrigating *(Pagpatubig)*	MD					
Plowing *(Pagdaro)*						
Man and animal	MAD					
Man and machine	MMD					
Rotavating *(Pagkaras/Pagdugmok sa gi-daro)*						
Man and machine	MMD					
Harrowing *(Pagkaras)*						
Man and animal	MAD					
Man and machine	MMD					
Leveling *(Pag sapla o pag patag sa tamnanan)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Lining *(Pagbadlis sa basakan)*	MD					
Pulling and bundling of seedlings *(Pag-ibot og pag-bangan sa binhi)*	MD					
Hauling of seedlings *(Paghakot og pagkatag sa binhi)*	MD					
Planting *(Pagtanom)*						
Direct seeding (broadcasting)	MD					
Direct seeding (drum seeder)	MD					
Transplanting	MD					
Replanting	MD					
Care of Crops						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					

Table 4.2.3a continued. . . (Labor inputs, before, dry cropping season)

105	106	107	108	109	110	111
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Fertilizer application *(Pag-abono)*	MD					
Weed Control *(Pagsumpo sa sagbot)*						
Manual	MD					
Weeding using rotary weeder	MD					
Chemical spraying	MD					
Pest Control	MD					
Irrigating *(Pagpatubig)*	MD					
Harvesting / Reaping *(Pag-ani)*						
Man	MD					
Threshing *(Paggiok)*						
Man	MD					
Man and machine	MMD					
Combined harvesting and threshing (use of combine harvester)	MMD					
Other permanent employee salary	MD					
Hauling of Produce *(Paghakot sa produkto)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Drying *(Pagbuwad/Pagpa-uga)*						
Solar						
Mechanical	MMD					
Other (s): specify _____						

Note: *Units: MD = Man-day
MAD = Man-Animal Day
MMD = Man-Machine Day

4.2.3b Labor Inputs for Rice Production, Now (Dry Cropping Season)

105	106	107	108	109	110	111
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Seedbed Preparation *(Pag andam sa saboran/taguran)*	MD					
Land Preparation *(Pag andam sa tamnanan)*						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					
Irrigating *(Pagpatubig)*	MD					
Plowing *(Pagdaro)*						
Man and animal	MAD					
Man and machine	MMD					
Rotavating *(Pagkaras/Pagdugmok sa gi-daro)*						
Man and machine	MMD					
Harrowing *(Pagkaras)*						
Man and animal	MAD					
Man and machine	MMD					
Leveling *(Pag sapla o pag patag sa tamnanan)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Lining *(Pagbadlis sa basakan)*	MD					
Pulling and bundling of seedlings *(Pag-ibot og pag-bangan sa binhi)*	MD					
Hauling of seedlings *(Paghakot og pagkatag sa binhi)*	MD					
Planting *(Pagtanom)*						
Direct seeding (broadcasting)	MD					
Direct seeding (drum seeder)	MD					
Transplanting	MD					
Replanting	MD					
Care of Crops						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					

Table 4.2.3b continued. . . (Labor inputs, now, dry cropping season)

105	106	107	108	109	110	111
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Fertilizer application *(Pag-abono)*	MD					
Weed Control *(Pagsumpo sa sagbot)*						
Manual	MD					
Weeding using rotary weeder	MD					
Chemical spraying	MD					
Pest Control	MD					
Irrigating *(Pagpatubig)*	MD					
Harvesting / Reaping *(Pag-ani)*						
Man	MD					
Threshing *(Paggiok)*						
Man	MD					
Man and machine	MMD					
Combined harvesting and threshing (use of combine harvester)	MMD					
Other permanent employee salary	MD					
Hauling of Produce *(Paghakot sa produkto)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Drying *(Pagbuwad/Pagpa-uga)*						
Solar						
Mechanical	MMD					
Other (s): specify _____						

Note: *Units: MD = Man-day
MAD = Man-Animal Day
MMD = Man-Machine Day

4.2.4a Labor Inputs for Rice Production, Before (Wet Cropping Season)

112	113	114	115	116	117	118
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Seedbed Preparation *(Pag andam sa saboran/taguran)*	MD					
Land Preparation *(Pag andam sa tamnanan)*						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					
Irrigating *(Pagpatubig)*	MD					
Plowing *(Pagdaro)*						
Man and animal	MAD					
Man and machine	MMD					
Rotavating *(Pagkaras/Pagdugmok sa gi-daro)*						
Man and machine	MMD					
Harrowing *(Pagkaras)*						
Man and animal	MAD					
Man and machine	MMD					
Leveling *(Pag sapla o pag patag sa tamnanan)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Lining *(Pagbadlis sa basakan)*	MD					
Pulling and bundling of seedlings *(Pag-ibot og pag-bangan sa binhi)*	MD					
Hauling of seedlings *(Paghakot og pagkatag sa binhi)*	MD					
Planting *(Pagtanom)*						
Direct seeding (broadcasting)	MD					
Direct seeding (drum seeder)	MD					
Transplanting	MD					
Replanting	MD					
Care of Crops						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					

Table 4.2.4a continued. . . (Labor inputs, before, wet cropping season)

112	113	114	115	116	117	118
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Fertilizer application *(Pag-abono)*	MD					
Weed Control *(Pagsumpo sa sagbot)*						
Manual	MD					
Weeding using rotary weeder	MD					
Chemical spraying	MD					
Pest Control	MD					
Irrigating *(Pagpatubig)*	MD					
Harvesting / Reaping *(Pag-ani)*						
Man	MD					
Threshing *(Paggiok)*						
Man	MD					
Man and machine	MMD					
Combined harvesting and threshing (use of combine harvester)	MMD					
Other permanent employee salary	MD					
Hauling of Produce *(Paghakot sa produkto)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Drying *(Pagbuwad/Pagpa-uga)*						
Solar						
Mechanical	MMD					
Other (s): specify _____						

Note: *Units: MD = Man-day
MAD = Man-Animal Day
MMD = Man-Machine Day

4.2.4b Labor Inputs for Rice Production, Now (Wet Cropping Season)

112	113	114	115	116	117	118
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Seedbed Preparation *(Pag andam sa saboran/taguran)*	MD					
Land Preparation *(Pag andam sa tamnanan)*						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					
Irrigating *(Pagpatubig)*	MD					
Plowing *(Pagdaro)*						
Man and animal	MAD					
Man and machine	MMD					
Rotavating *(Pagkaras/Pagdugmok sa gi-daro)*						
Man and machine	MMD					
Harrowing *(Pagkaras)*						
Man and animal	MAD					
Man and machine	MMD					
Leveling *(Pag sapla o pag patag sa tamnanan)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Lining *(Pagbadlis sa basakan)*	MD					
Pulling and bundling of seedlings *(Pag-ibot og pag-bangan sa binhi)*	MD					
Hauling of seedlings *(Paghakot og pagkatag sa binhi)*	MD					
Planting *(Pagtanom)*						
Direct seeding (broadcasting)	MD					
Direct seeding (drum seeder)	MD					
Transplanting	MD					
Replanting	MD					
Care of Crops						
Clearing and repair of dikes *(Paglimpyo sa semento og kanal)*	MD					

Table 4.2.4b continued. . . (Labor inputs, now, wet cropping season)

112	113	114	115	116	117	118
Farm Activities	Unit*	Qty Hired labor	Qty Family labor	Qty Exchange labor	Price/ unit (PhP)	Total Cost (PhP)
Fertilizer application *(Pag-abono)*	MD					
Weed Control *(Pagsumpo sa sagbot)*						
Manual	MD					
Weeding using rotary weeder	MD					
Chemical spraying	MD					
Pest Control	MD					
Irrigating *(Pagpatubig)*	MD					
Harvesting / Reaping *(Pag-ani)*						
Man	MD					
Threshing *(Paggiok)*						
Man	MD					
Man and machine	MMD					
Combined harvesting and threshing (use of combine harvester)	MMD					
Other permanent employee salary	MD					
Hauling of Produce *(Paghakot sa produkto)*						
Man	MD					
Man and animal	MAD					
Man and machine	MMD					
Drying *(Pagbuwad/Pagpa-uga)*						
Solar						
Mechanical	MMD					
Other (s): specify _____						

Note: *Units: MD = Man-day
MAD = Man-Animal Day
MMD = Man-Machine Day

4.3 Rice production and disposal *[For the same largest parcel.]*

4.3.1 Dry Cropping Season

119	120	121	122	123	124	125	126	127	128	129	130
Area planted	Quantity harvested	Unit	Conversion Factor (unit to kg)	Harvester's Share	Thresher's Share	Land owner's Share/Rental	Quantity Consumed	Quantity sold	Total output sold in kg	Farm Gate Price (PhP)	Gross Income (Php)*
Before:											
Now:											

4.3.2 Wet Cropping Season

131	132	133	134	135	136	137	138	139	140	141	142
Area planted	Quantity harvested	Unit	Conversion Factor (unit to kg)	Harvester's Share	Thresher's Share	Land owner's Share/Rental	Quantity Consumed	Quantity sold	Total output sold in kg	Farm Gate Price (PhP)	Gross Income (Php)*
Before:											
Now:											

Note: * To be computed based on total quantity harvested and farm gate price.

Codes for Unit (121/133):

1= Kilograms; 2= Sacks; 3= Can; 4= Cavans; 5= Others, specify _____

4.4 Marketing Practice for Palay Production *[Note: For Non-beneficiaries, answer only "Now"]*

143	144	145	146	147	148	149	150	151
Crop	What was the primary outlet?		Reason for choice of market outlet		How did you package the product sold?		How far is this market from production point or farm (km)	
	Before ARISP III (2009)	Now	Before ARISP III (2009	Now	Before ARISP III (2009)	Now	Before ARISP III FMR Construction	Now
Rice								
Coconut								
Vegetables								

Codes for Primary Outlet (144/145)		Codes for Reason for Choice of Market Outlet (146/147)	Codes for Packaging of Product (148/149)
1- Traders	7- Cooperatives	1-High Buying Price	1-sacks
2- Market	8- Interlinked Market Outlet	2-Regular Buyer	2-kaings
3-Buying Station	9- Store	3-Lots of buyer w/n the barangay	3-basket
4- Input Dealers	10-Neighbors/ Relatives	4 – Others (specify)	4-net bags
5- Moneylenders	11—Others		5-wooden crates
6-Regular Buyer (Suki)			6-others (specify)

4.5 Transport and Delivery *[Note: For Non-beneficiaries, answer only "Now"]*

152	153	154	155	156	157	158	159	160
Crop	How did you bring your produce to marketing outlet?		Travel time (in minutes)		Mode of transportation		Transportation Cost (PhP/unit)*	
	Before ARISP III FMR Construction	Now	Before ARISP III FMR Construction	Now	Before ARISP III FMR Construction	Now	Before ARISP III FMR Construction	Now
Rice								
Coconut								
Vegetable								

Codes for product delivery (153/154)	Codes for Mode of Transport (157/158)	Note: * Indicate unit (e.g. cavans, sack)
1-Pick up (on farm)	1-Truck	
2-Pick up on road side/pick up point	2-Jeep	
3-Delivered to buyer	3-Tricycle	
4-Others (specify	4- Motorcycle / Habal-habal	
	5- Hand carry/ walking	
	6- Others (specify)	

4.6. Problems encountered in marketing Palay *[Note: For Non-beneficiaries, answer only "Now"]*

161	162	163
Are any of the following an issue that may hinder or dissuade you from selling at the market(s)? 0=NO; 1=YES	Before ARISP III FMR Project (2009)	Now
Distance to crop market		
Availability of a suitable vehicle		
Lack of information on market prices		
Lack of demand from market buyers due to their feeling goods are of low quality		
Lack of demand from market buyers due to the quantity of the goods being too small		
More convenient/cheap to sell to buyer who comes to you		
Tied to a buyer who is not at the market		
Other, specify		

4.7 Assets

4.7.1 Farm Assets

164	165	166	167	168
Asset Code	Farming Assets owned and used in Palay production	Quantity	How much did you buy or acquire this (asset)? PhP	Estimated life span (Years)
1	Tillage Equipment- Conventional			
1.1	Plow *(Daro)*			
1.2	Harrow *(Karas)*			
2	Tillage Equipment- Mechanical			
2.1	Tractor *(Traktor)*			
2.1	Power Tiller			
3	Water Pump			
4	Tractor			
4.1	Hand tractor			
4.1	4–wheel tractor			
5	Agricultural/Garden Tools			
5.1	Hoe *(Bunglay/basok)*			
5.2	Saddle *(Garab)*			
5.3	Axe *(Atsa)*			
5.4	Shovel *(Pala)*			
6	Mechanical Harvester			
6.1	Reaper			
6.2	Combined Harvester			
7	Livestock			
7.1	Carabao			
8	Other, specify _____			

169. Total annual depreciation cost (2017): to be computed _____

4.7.2 Household Assets and Vehicles

170	171	172	173	174	175
Code	Item name	Quantity	Value(Purchase price in PhP)	Year purchased	Where did you obtain the money used to buy this item?
	Household				
1	Radio/stereo				
2	Tape recorder				
3	Television				
4	Refrigerator				
5	Electric fan				
6	DVD Player/Karaoke				
7	Microwave oven				
8	Gas stove/Gas range				
9	Computer				
10	Cellular phone				
11	Kerosene stove/ Butane Gas stove				
	Vehicles				
12	Bicycle				
13	Pedicab				
14	Motorcycle or Scooter				
15	Tricycle				
16	Car/Jeep				
17	Pick-up/Truck				
18	Pumpboat				
19	Non-motorized Banca				
20	Others, specify				

SECTION V. ASSISSTANCE AND LOAN OPPORTUNITIES FROM GOVERNMENT AGENCIES AND NON-GOVERNMENT ORGANIZATIONS

5.1 Government Agencies

176. Did you receive cash assistance from government for productive purposes? _____ (0 - No;1 - Yes)

177	178	179	180	181
Cash Assistance (Amount)	Year	National	Provincial	Local
1				
2				
3				
4				
5				

182. Did you receive non-cash assistance from the government for productive purposes? _____ (0 - No;1 - Yes)

183	184	185	186	187
Noncash Assistance (Form)	Year	National	Provincial	Local
1				
2				
3				
4				

5.2 Private/Non-government Organizations

188. Did you receive cash assistance from NGOs for productive purposes?_____
(0 - No; 1 - Yes)

189	190	191
Name of NGO	Amount	Year
1		
2		
3		
4		

192. Did you receive non-cash assistance from NGOs for productive purposes? _____
(0 - No; 1 - Yes)

193	194	195
Name of NGO	Form of Assistance	Year
1		
2		
3		
4		

5.3 Credit access before and after ARISP III

196. Did you avail loans intended for productive purposes from government, non-government, and other organizations before ARISP III (2009)? _____ (0 – No; 1 – Yes)

197	198	199
Name of Source	Amount	Year
1		
2		
3		
4		

200. Did you avail loans intended for productive purposes from government, non-government, and other organizations (including ARB Cooperatives) after ARISP III (2017)? _____ (0 – No; 1 – Yes)

201	202	203
Name of Source	Amount	Year
1		
2		
3		
4		

SECTION VI. INFORMATION ON ORGANIZATIONAL MEMBERSHIP AND TRAINING/SEMINARS ATTENDED

6.1 Organizational Membership

204	205	206
Organization	Have you or any member of your household been a member of any of the following organizations? CODES: 0 – No 1 – Yes	How would you describe you or your household member's participation in this organization? CODES: 1 – Adviser/Officer/Board Member 2 – Active Member 3 – Non-Active member 4 – Others, specify _____
Irrigators' Association		
Cooperatives (specify: _____)		
Water Users' Association		
Agricultural		
Labor		
Religious		
Youth		
Women's' Association		
Political		
Organization for seniors/ elderly		
Health-related		
Patrol/ peace and order		
Others, specify _____		

For ARISP III Beneficiaries only.

207. Benefits obtained from joining the Irrigators' Association:

Before ARISP III	Now

208. Current problems encountered within the Irrigators' Association:

_____
_____
_____

209. Benefits obtained from joining the Agrarian Reform Beneficiaries Cooperative:

Before ARISP III	Now

210. Current problems encountered within the ARB Cooperative:

_____
_____
_____

6.2 Support received and social capital – Training, extension information and other support services received

211	212	213	214	215	216	217		
Item Code	Type of training, extension information and other support services	Has anyone in your household received this support since 2009? 0=NO (GO TO NEXT ROW) 1 = YES	In which year, did you first receive this support?	In which year did you receive the latest support?	How many times did you receive this support since 2009?	Who provided the MOST RECENT offer/services? [INSERT ALL PROVIDERS IF SUPPORT IMPLEMENTED BY MULTIPLE SOURCES] 1=ARISP III 2=LOCAL NGO 3=INTERNATIONAL NGO 4=NATIONAL GOVERNMENT AGENCIES (DA, NIA, etc) 5=LOCAL GOVERNMENT UNIT 6=IRRIGATORS' ASSOCIATION 7=OTHER, SPECIFY		
						Provider 1	Provider 2	Provider 3
	Support Services							
1	Repair to damages to an irrigation system that you use							
2	Concrete lining of an irrigation canal that you use							
3	Extension of the area covered by an irrigation system that you use							
4	Provision of post-harvest facilities, including solar dryers and storage warehouses							
5	Provision of Certified Seeds							
6	Subsidies for other agricultural inputs							
7	Other (specify)							
	Trainings							
8	Training of members of the Irrigators' Association that is linked to an irrigation system that you use, on skills relating to the management of the system?							
9	Training and technology support relating to the Palay Check system							
10	Training of Cooperative members on Basic Cooperatives Management							

Table 6.2, continued. . .

211	212	213	214	215	216	217		
Item Code	Type of training, extension information and other support services	Has anyone in your household received this support since 2009? 0=NO (GO TO NEXT ROW) 1 = YES	In which year, did you first receive this support?	In which year did you receive the latest support?	How many times did you receive this support since 2009?	Who provided the MOST RECENT offer/services? [INSERT ALL PROVIDERS IF SUPPORT IMPLEMENTED BY MULTIPLE SOURCES] 1=ARISP III 2=LOCAL NGO 3=INTERNATIONAL NGO 4=NATIONAL GOVERNMENT AGENCIES (DA, NIA, etc) 5=LOCAL GOVERNMENT UNIT 6=IRRIGATORS' ASSOCIATION 7=OTHER, SPECIFY		
						Provider 1	Provider 2	Provider 3
	Trainings							
11	Training of Water Users' Association members on skills relating to the management of the system?							
12	Rice Productivity Enhancement Techno Demo Project cum Season-Long Training							
13	Vegetable Production Season-Long Training							
14	Coconut-based Diversified Integrated Farming System							
15	Training on Organic Agriculture/Organic Banana Production							
	Extension Information							
16	Access to market price information							
17	Access to weather information/natural calamity early warning system							
18	Access to early warning information on pest infestation, crop disease, etc.							
19	Other, please specify							

218. What benefits have you experienced in having a Farm to Market Road (FMR) in your community? You can encircle more than one number/code as long as it is applicable to you. *[For affected beneficiaries only.]*

1. Reduced transportation cost

1.1 Cost per person before ARISP III FMR (2009): _____

1.2 Cost per person now: _____

2. Reduced travel time

2.1 Travel time (in minutes) before ARISP III FMR (2009): _____

2.2 Travel time (in minutes) now: _____

3. Increased mobility

3.1 Frequency of travel (in a week) before ARISP III FMR (2009): _____

3.2 Frequency of travel (in a week) now: _____

4. Employed during construction of FMR

4.1 Total earnings/income generated: _____

5. Ease in transporting goods

5.1 Rate ease in transporting goods (1 is the lowest and 5 is the highest): _____

6. Sense of security

6.1 Provide details: _____

7. Supports tourism in the locality

7.1 Number of tourists before ARISP III FMR: _____

7.2 Number of tourists now: _____

8. Others, please specify: _____

219. Potable Water System (PWS) Benefits:

219.1	219.2	219.3	219.4
Questions	Before ARISP III / 2009	During Implementation (2012-2014)	Now
Do you have access to safe water? (1= YES, 0= NO)			
What is the source of this safe water?			
Travel time to fetch water (in minutes)			
Sufficiency of water supply			
How many times did you or your family members had water borne diseases?			

220. Problems encountered in the PWS:

220.1	220.2	220.3
Have you encountered these following problems in your Potable Water System? (1= YES, 0= NO)	Answer	Details
Water pressure from the source is low		
Water is not clean		
Collection of Water Users' fee		
Insufficient water supply		
Mismanagement of BAWASA/RUWASA		
Others, specify:		

221. Questions on the usage of solar dryer: Ask if beneficiary is using the solar dryer provided by ARISP III

221.1	221.2	221.3
Mga Pangutana	Sauna	Karon
Pamaagi sa pagbuwad		
Gidaghanon sa ibuwad		
Gidugayon sa pagbuwad		
Gasto sa pagbuwad		
Kantidad sa nausik sa pagbuwad *(Drying losses)*		
Kalidad sa nabulad nga palay (describe)		

222. Questions on the usage of storage warehouse: Ask if beneficiary is using the storage warehouse provided by ARISP III

222.1	222.2	222.3
Mga Pangutana	Sauna	Karon
Pamaagi sa pagtipig sa humay		
Gidaghanon sa itipig nga humay		
Didugayon sa pagtipig sa humay		
Gasto sa pagtipig sa humay		
Kantidad sa nausik sa pagtipig sa humay *(Storage losses)*		
Pila ka-porsyento ang nausik? *(% storage loss)*		
Kalidad sa stored palay (describe)		

SECTION VII. ADDITIONAL INFORMATION FOR FARMER-BENEFECIARIES OF ARISP III

226. When did you get involved with the ARISP III? _____

227. Do you think that the project implementers of ARISP III from DAR, NIA, DPWH, and other partner-agencies perform well in delivering their services? _____ (0 – No; 1 – Yes)

227.1 Why do you say so? _____

_____

Note: Ask *Questions 228* to *231* if the *MSC Code* in *2* for the respondent is *1*.

228. How did you become involved with the ARISP III? What is your involvement?

_____

_____

_____

229. What services have you accessed from the project (i. e. infrastructure, training, technical assistance, institutional and market development, micro-financing, etc.)?

_____

_____

_____

230. From your point of view, describe the most significant change that has resulted from your involvement with the ARISP III.

_____

_____

_____

230.1 Why is this change significant to you?

_____

_____

_____

231. Would you recommend implementation of this kind of project to other areas?_____ (0 – No; 1 – Yes)

231.1 If yes, explain _____

_____

_____

231.2 If no, explain_____

_____

_____

232. How do you assess the success of the ARISP III? _____

232.1 High, explain _____
_____
_____

232.2 Moderate, explain _____
_____
_____

232.3 Low, explain _____
_____
_____

233. Do you have any suggestion(s) to further improve the implementation of ARISP III? ____ (0 – No; 1 – Yes)

233.1 If yes, explain _____
_____
_____

Thank You Very Much!

Annex 3. Questionnaire for Organizations

CONFIDENTIALITY: The Interviewer takes the responsibility in guarding the confidentiality of all the information generated through this instrument.	**Impact Evaluation of the Agrarian Reform Infrastructure Support Project – Phase III (ARISP III) in Eastern Visayas**

ID:		Enumerator:	Supervisor:
DATE:		Name and Signature	Name and Signature

I am _____, a researcher from the Visayas State University (VSU) in Baybay City, Leyte. Our research team has been commissioned by NEDA Regional Office VIII to evaluate the Agrarian Reform Infrastructure Support Project – Phase III (ARISP-III) which was implemented by the Department of Agrarian Reform in your area. You have been randomly selected as respondent to represent your (ARBO). The information that will be obtained from this survey will provide insights on the outcomes and impacts of the project and will guide the policy makers in scaling up or approving future similar development project. Rest assured that all information will be kept confidential and will be used for research purposes only.

Standard Codes:	0 = No	1 = Yes	-66 = No Response
-77 = Do not know	-88 = none	-99 = Not Applicable	

Name of the Association: _____

Address: _____

I. GENERAL INFORMATION AND PROFILE OF THE ORGANIZATION

1. What type of organization is your association?

( ) Irrigators' Association

( ) Agrarian Reform Beneficiaries' Cooperative

( ) Water Association

( ) Barangay Council

2. In what year was your association/cooperative organized? _____

3. What were the types of projects your association/cooperative had been involved under ARISPIII?

( ) Construction of New Irrigation system

( ) Post Harvest Facilities

( ) Rehabilitation of irrigation system

( ) Farm to Market Road

( ) Potable water

( ) Institutional Development and Agriculture and Agribusiness Development

4. What were/are the assets your association/cooperative owned?

	Before ARISPIII	During ARISPIII	Present
Total Number of members Male Female			
Capital Build Up			
Land			
Machineries and equipment			
Furniture and fixture			
Vehicle			
Others, specify			

5. What were the projects/activities your association/cooperative had undertaken before ARISPIII and what agencies provided the needed assistance?

Project/Activity	Source of Assistance				
	MLGU	MLGU	NIA	DAR	Others _____

II. INPUTS FOR ARISPIII PROJECT

6. What were the assistance your association/cooperative received from each participating agency under the ARISPIII project? Please provide details.

Agency/Source	Irrigation Project			
	Cash	In-Kind	Training	Counterpart
BLGU				
MLGU				
PLGU				
DAR				
NIA				
Association's Equity				
Total				
	Farm to Market Road			
BLGU				
MLGU				
PLGU				
DAR				
DPWH				
Association's Equity				
Total				
	Post- Harvest Facilities			
BLGU				
MLGU				
PLGU				

Previous table continued. . .

Agency/Source	Post- Harvest Facilities			
	Cash	In-Kind	Training	Counterpart
DAR				
NIA				
Association's Equity				
Total				
	Institutional Development and Agriculture and Agribusiness Development			
BLGU				
MLGU				
PLGU				
DAR				
NIA				
TAPI				
Association's Equity				
Total				

III. ARISPIII PROJECT CONCEPTUALIZATION AND IMPLEMENTATION ACTIVITIES AND RESPONSIBLE AGENCIES

7. What were the activities that your association/cooperative conducted and what agencies provided the needed assistance during the conceptualization and implementation of the ARISPIII project?

Activity	Irrigation Project				
	BLGU/MLGU/ PLGU	NIA	DAR	DPWH	TAPI
1. Planning meeting					
2. Project site Selection					
3. Fund accessing and follow up					
4. Purchase of materials and supplies					
5. Project construction					
6. Project monitoring					
7. Conduct of seminars/trainings					
8. Meetings					
9. Evaluation and approval of completed project					
	Farm to Market Road				
1. Planning meeting					
2. Site visitation					
3. Fund sourcing and follow up					
4. Construction					
5. Monitoring					
6. Meetings					
7. Evaluation and approval					
	Post-Harvest Facilities				
1. Planning meeting					
2.Site visitation					
3. Fund sourcing and follow up					
4.Construction					
5. Monitoring					
6. Evaluation and approval					

Previous table continued. . .

Activity	Potable Water				
	BLGU/MLGU/ PLGU	NIA	DAR	DPWH	TAPI
1. Planning meeting					
2. Site selection					
3. Fund sourcing and follow up					
4. Construction					
5. Monitoring					
6. Meetings					
7. Project evaluation and approval					
	Institutional Development and Agriculture and Agribusiness Development				
1. Planning meeting					
2. Project selection					
3. Site selection					
4. Fund sourcing and follow up					
5. Purchase of materials and supplies					
6. Trainings/ Seminar Workshops					
7. Project monitoring					
8. Project evaluation					

IV. PROJECT OUTPUT

Criteria	Irrigation Project		
	Before ARISPIII	During ARISPIII	Present
What was the total area (in ha.) of irrigated rice field?			
What was the total area of rice field planted (ha.)?			
Scope of irrigation system provided by ARISP III (service area in ha)			
How long was the cemented irrigation canal (m.)?			
How long was the earth irrigation canal (m.)?			
How was the water from the irrigation canal used aside from watering the ricefields?			
Was there any policy crafted and implemented about the use of water from the irrigation canals? Provide details.			
	Farm to Market Road		
How long was the constructed farm to market road (FMR in km)?			
How long was the cemented part of the FMR (km)?			
How long was the unpaved/dirt part of the FMR (km)?			

Previous table continued. . .

Criteria	Farm to Market Road		
	Before ARISPIII	During ARISPIII	Present
How many barangays benefited from the FMR?			
How many residents were served by the FMR project?			
What are the other uses of the road? Other benefits provided by the FMR?			
	Post- Harvest Facilities		
What is the floor area (capacity in cavans of palay or sq. m.) of the storage warehouse constructed by ARISP III for your association/ cooperative?			
What is the building made of?			
How is the building used?			
What are the equipment and facilities present in the building?			
What furniture and fixtures are present in the building?			
What is the total area of the solar dryer (sq. m.) provided by ARISP III?			
How big is the area with finished cement (sq. m.)?			
How big is the area with rough cement (sq. m.)?			
What are the other uses of solar dryer?			
	Potable Water		
What organization was tasked to manage the potable water system?			
How big are the pipes used?			
How many households are served by the potable water system?			
Is the water supply consistently available?			
Is the water available in good quality?			
How else is the potable water used by the residents?			
Is there any policy crafted and implemented on the management of the potable water system?			

Previous table continued. . .

Criteria	Institutional Development and Agriculture and Agribusiness Development		
	Before ARISPIII	During ARISPIII	Present
Is the association/cooperative newly organized or revived?			
Is the association registered with DOLE, CDA or SEC?			
What were the projects undertaken by the association?			
How many farmer-members were involved in the association?			
What are the products produced by the association/ cooperative?			
What are the trainings, seminars and workshop attended by the officers and members?			
How many of the officers and members attended the trainings, seminars and workshops?			
What are the other products produced from the projects identified?			
Was there a policy crafted and implemented?			

V. PROJECT OUTCOMES

Criteria	Irrigation Project		
	Before ARISPIII	During ARISPIII	After ARISPIII
How many farmers were served by the irrigation project? (specify total no. of farmers, no. of Agrarian Reform beneficiaries, no. of non-Agrarian Reform beneficiaries)			
Number of cropping's per year			
Average harvest per cropping (cavan per ha)			
Average quantity sold per cropping			
Average quantity consumed			
Other crops harvested			
Sales from other crops harvested (PhP) that utilized irrigation water			
Existence of conflict between or among the farmers served by the irrigation (Provide details)			
Awards earned (specify type and level of awards – local, regional, national)			
What are the problems in irrigating palay farms? Rank the problems.			

Previous table continued. . .

Criteria	Farm to Market Road		
	Before ARISPIII	During ARISPIII	After ARISPIII
Mode of transportation			
Average transportation cost per trip • Motorcycle • Carabao • Laborer			
Average income of the construction workers hired during the road construction (no. of man-days x rate per day)			
Average number of tourists per month (specific to Balaquid FMR)			
Average income earned by neighboring establishments/ projects (e.g. tourists spots) due to increased accessibility			
Time of the day that people travel • Along the road			
Other uses of the farm to market road			
What are the problems encountered in the use of FMR? Rank the problems.			
	Post- Harvest Facilities		
Means of drying palay in the area			
Means of storing palay in the area			
On average, how many farmer-members are able to store palay in the storage warehouse/ building facility per cropping season?			
On average, how many sacks of palay (quantity) are stored per cropping season?			
Quality of rice stored in the storage facility			
Quantity of rice dried in the solar drier			
Quality of rice dried in the solar drier			
Daily revenue from storage services From members From non-members			
Daily revenue from drying services From members From non-members			
Annual income from the storage facility			
Annual income from solar dryer			
Quantity of drying losses			
Quantity of storage losses			
Percentage of storage losses			

Previous table continued. . .

Criteria	Post- Harvest Facilities		
	Before ARISPIII	During ARISPIII	After ARISPIII
Duration of drying			
Duration of storing			
Problems encountered in the use of ARISP III storage warehouse and solar dryer. Rank the problems.			
	Potable Water		
Efficiency in the collection of water service fee (collection period in days)			
Existence of conflict among water users (provide details)			
Incidence of illnesses due to water Quality			
Water service level provided			
Other uses of water			
Problems encountered in the use of potable water system. Rank the problems.			
	Institutional Development and Agriculture and Agribusiness Development		
Name of the association/ cooperative			
Number of members Male Female			
Amount of Capital Build Up (PhP)			
Efficiency in the collection of Irrigation Service Fee?			
Members' cooperation			
Improved financial management			
Annual net profit of the organization			
Total value of available assets (P)			
Awards earned			

Knowledge, Attitude and Practice Questionnaire

I. Management Knowledge

Instruction: Using the scale provided below, please rate the level of knowledge you have about the requirements and/or activities involved in managing an association like your association. Please encircle the number corresponding to your rating. It is important that you respond to every statement and that you only have one rating per statement. Rest assured that all information would be treated confidential. Please do not leave any space unanswered.

Rating Scale:
4 – High knowledge
3 – Moderate knowledge
2 – Low knowledge
1 – Very low knowledge or no knowledge at all

A. Planning	Before ARISP III				Present			
1. How to set the association's Vision, Mission, Goals and Objectives (VMGO).	4	3	2	1	4	3	2	1
2. How to make strategies to improve business performance.	4	3	2	1	4	3	2	1
3. How to prepare budget for the association's activities.	4	3	2	1	4	3	2	1
4. How to set production targets	4	3	2	1	4	3	2	1
5. How to identify resources needed for your association.	4	3	2	1	4	3	2	1
6. How to establish goal-related tasks.	4	3	2	1	4	3	2	1
7. How to prioritize goals and tasks	4	3	2	1	4	3	2	1
8. How to create member assignments and timelines.	4	3	2	1	4	3	2	1
9. How to establish evaluation methods.	4	3	2	1	4	3	2	1
10. How to identify alternative courses of action.	4	3	2	1	4	3	2	1
B. Organizing								
1. How to elineate duties and responsibilities of the association's officers and members	4	3	2	1	4	3	2	1
2. How to promote efficient use of the association's resources.	4	3	2	1	4	3	2	1

3.	How to adjust association's objectives to fit current situations	4	3	2	1	4	3	2	1
4.	How to identify activities required to achieve the association's objectives	4	3	2	1	4	3	2	1
5.	How to group similar activities for efficient operation of the association	4	3	2	1	4	3	2	1
6.	How to define responsibilities of each association member	4	3	2	1	4	3	2	1
7.	How to assign tasks to association's employees and/or co-members	4	3	2	1	4	3	2	1
8.	How to define authority relationship between superiors and subordinates	4	3	2	1	4	3	2	1
9.	How to provide members and/or employees all requirements for achieving the association's objectives	4	3	2	1	4	3	2	1
10.	How to coordinate efforts of all for achieving the association's objectives	4	3	2	1	4	3	2	1
	C. Leading								
1.	How to set incentive or motivation schemes for the association.	4	3	2	1	4	3	2	1
2.	Understanding the role of association leaders in the implementation of activities for the association's benefit	4	3	2	1	4	3	2	1
3.	How to provide guidance and build confidence in performing tasks among association members.	4	3	2	1	4	3	2	1
4.	How to receive and follow instructions from association officials.	4	3	2	1	4	3	2	1
5.	How to conduct meetings using parliamentary procedures	4	3	2	1	4	3	2	1
6.	How to mobilize resources of the association's activities	4	3	2	1	4	3	2	1
7.	How to double-check if the association's environment is suitable for the planned activity or project	4	3	2	1	4	3	2	1
8.	How to communicate properly.	4	3	2	1	4	3	2	1

9.	How to give instructions to team members in relation to the completion of the planned activity or project of the association	4	3	2	1	4	3	2	1
10.	How to supervise and coach association members or employees and adjust during activity execution if needed	4	3	2	1	4	3	2	1
	D. Controlling								
1.	How to devise strategies to be able to adhere to the association's plans.	4	3	2	1	4	3	2	1
2.	How to make schedule of activities that must be followed by association members.	4	3	2	1	4	3	2	1
3.	How to discipline self and co-members of the association.	4	3	2	1	4	3	2	1
4.	How to keep records of the association's activities and finances	4	3	2	1	4	3	2	1
5.	How to set performance standards for the association and its officers and members	4	3	2	1	4	3	2	1
6.	How to measure actual performance of the association, its officers and members	4	3	2	1	4	3	2	1
7.	How to compare actual performances with the standards	4	3	2	1	4	3	2	1
8.	How to analyze deviations of the association's performances against the standards being set.	4	3	2	1	4	3	2	1
9.	How to take corrective actions in case of deviations.	4	3	2	1	4	3	2	1

III. MANAGEMENT ATTITUDE

Instruction: Using the scale provided below, please indicate your level of agreement or disagreement to the statements listed below. Please encircle the number corresponding to your rating. It is important that you respond to every statement and that you indicate only one rating per statement. Rest assured that all information would be treated confidentially.

Rating Scale:

4- Strongly agree

3- Agree

2- Disagree

1- Strongly disagree

A. Planning	Before ARISP III				Present			
1. During its formative stage, it is important that an association sets its Vision, Mission, Goals and Objectives.	4	3	2	1	4	3	2	1
2. To improve the association's business performance, it is important that the association members should be familiar about the strategies that the association plans to implement.	4	3	2	1	4	3	2	1
3. Since the business of the association is only small, there is no need to prepare activity budget.	4	3	2	1	4	3	2	1
4. If the association's business project is just small, there is no need to set sales quotas.	4	3	2	1	4	3	2	1
5. Before the association starts an activity or project, it is necessary to identify resources that are available and those that still need to be sourced out.	4	3	2	1	4	3	2	1
6. Establishing goal-related tasks is important both for big and small associations.	4	3	2	1	4	3	2	1
7. For small associations, there is no need to prioritize goals and tasks.	4	3	2	1	4	3	2	1
8. For efficient and effective operation, associations should create member assignments and timelines of activities.	4	3	2	1	4	3	2	1
9. There is no need to establish evaluation methods for the operation of a small association.	4	3	2	1	4	3	2	1
10. As part of the planning process, it is important that associations should identify alternative courses of action for its activities or projects.	4	3	2	1	4	3	2	1
B. Organizing								
1. Knowing your responsibilities and that of your co-members is important.	4	3	2	1	4	3	2	1
2. Specifying tasks of workers or association members is not necessary for small associations.	4	3	2	1	4	3	2	1

3. Ensuring good relationships among association members and employees is important for the success of the association's business.	4	3	2	1	4	3	2	1
4. It is important that the procedure to be followed in operating the association's business is clearly spelled out.	4	3	2	1	4	3	2	1
5. It is just okay if the association keeps changing its objectives.	4	3	2	1	4	3	2	1
6. It is important to identify the activities that are needed achieve the association's objectives.	4	3	2	1	4	3	2	1
7. Operation of the association's project would be more efficient of similar activities are grouped and conducted as one activity.	4	3	2	1	4	3	2	1
8. It is okay for association officers to delegate authority to the members.	4	3	2	1	4	3	2	1
9. In a small association, there is no need to define authority relationship between officers and members.	4	3	2	1	4	3	2	1
10. To achieve the objectives of the association, there is a need for the association officers to coordinate the efforts of all association members.	4	3	2	1	4	3	2	1
C. Leading								
1. It is important for an association to select a capable set of leaders.	4	3	2	1	4	3	2	1
2. There is no need to give incentives to association workers or members.	4	3	2	1	4	3	2	1
3. Association leaders must be able to to initiate actions or projects for the good of the association.	4	3	2	1	4	3	2	1
4. Association leaders should be able to provide guidance and build confidence among the association members.	4	3	2	1	4	3	2	1
5. Association members should know how to follow instructions from the officers.	4	3	2	1	4	3	2	1
6. There is no need for association leaders and members to make a tentative plan before implementing an activity.	4	3	2	1	4	3	2	1
7. It is imperative that association leaders and members should be able to mobilize resources for the association's activities or projects.	4	3	2	1	4	3	2	1
8. It is important that association leaders and members should double-check the association's environment to see if it is suitable to the association's activities or projects.	4	3	2	1	4	3	2	1
9. Association leaders and members should be able to complete a plan that is initially made	4	3	2	1	4	3	2	1
10. Association leaders should be able to properly supervise and coach members on what to do to improve business performance of the association.	4	3	2	1	4	3	2	1

11. It is important that association officers and members should be able to make adjustments during plan execution if needed.	4	3	2	1	4	3	2	1
D. Controlling								
1. It is important that the association should be able to stick to its plans.	4	3	2	1	4	3	2	1
2. There is a need to properly scheduling the activities that the association will conduct.	4	3	2	1	4	3	2	1
3. There is a need to discipline the association's members and/or workers if they do not perform as they are expected.	4	3	2	1	4	3	2	1
4. Keeping records of the association's activities and finances is tedious and time consuming, so it's not necessary to do it.	4	3	2	1	4	3	2	1
5. Measuring actual performance of the association is important.	4	3	2	1	4	3	2	1
6. There is no need to compare actual performance of the association with the standards that have been set.	4	3	2	1	4	3	2	1
7. It is important to analyze deviations being committed by the association.	4	3	2	1	4	3	2	1
8. Taking corrective actions to deviations that are discovered during monitoring should be made an integral part of the association's activities.	4	3	2	1	4	3	2	1

IV. MANAGEMENT PRACTICES

Instruction: Using the scale provided below, please rate the extent to which your association has been performing the management practices listed below. Please encircle the number corresponding to your rating. It is important that you respond to every statement and that you only have one rating per statement. Rest assured that all information you will share with us will be treated confidentially. Please do not leave any space unanswered.

Rating Scale:

4 - Practiced to a great extent (always practiced)
3 - Moderately practiced (oftentimes practiced)
2 - Slightly practiced
1 - Not practiced at all

A. Planning	Before ARISP III				Present			
1. Setting the association's Vision, Mission, Goals and Objectives.	4	3	2	1	4	3	2	1
2. Orienting association members with the strategies to be employed by the association in implementing its activities/ projects.	4	3	2	1	4	3	2	1

3. Making activity or project budget.	4	3	2	1	4	3	2	1
4. Setting sales quotas for the products produced by the association.	4	3	2	1	4	3	2	1
5. Identifying of resources that are available and those that still need to be sourced out.	4	3	2	1	4	3	2	1
6. Establishing goal-related tasks.	4	3	2	1	4	3	2	1
7. Prioritizing goals and tasks.	4	3	2	1	4	3	2	1
8. Creating assignments for association members and setting activity timelines.	4	3	2	1	4	3	2	1
9. Establishing methods of evaluating performance of the association and its members.	4	3	2	1	4	3	2	1
10. Identifying alternative courses of action.	4	3	2	1	4	3	2	1
B. Organizing								
1. Orienting the members about the responsibilities and privileges of the association's officers and members.	4	3	2	1	4	3	2	1
2. Assigning specific tasks to association members and/or workers.	4	3	2	1	4	3	2	1
3. Fixing the objectives of the association.	4	3	2	1	4	3	2	1
4. Identifying specific activities to achieve the objectives of the association	4	3	2	1	4	3	2	1
5. Grouping of similar activities to optimize efforts and resources	4	3	2	1	4	3	2	1
6. Establishing clear procedures to follow in operating the association's business.	4	3	2	1	4	3	2	1
7. Defining responsibilities of each member or employee involved in the operation of the association's business.	4	3	2	1	4	3	2	1
8. Delegating authority to association members or employees	4	3	2	1	4	3	2	1
9. Defining authority relationship between association officers and members.	4	3	2	1	4	3	2	1
10. Providing association members or employees with all the requirements (i.e., resources, clear	4	3	2	1	4	3	2	1

directions, etc.) needed to achieve the association's objectives								
11. Coordinating efforts of all members or employees to achieve the association's objectives.	4	3	2	1	4	3	2	1
C. Leading								
1. Selecting capable set of leaders.	4	3	2	1	4	3	2	1
2. Providing motivations or incentives to association members or workers.	4	3	2	1	4	3	2	1
3. Association officers initiate actions pertaining to the implementation of the association's projects and/or activities.	4	3	2	1	4	3	2	1
4. Providing guidance and building of members' self confidence	4	3	2	1	4	3	2	1
5. Receiving instructions openly	4	3	2	1	4	3	2	1
6. Making a tentative plan before implementing an activity	4	3	2	1	4	3	2	1
7. Mobilizing of resources to ensure full implementation of a planned activity	4	3	2	1	4	3	2	1
8. Double-checking the environment to see if it is suitable to the project or activity to be implemented	4	3	2	1	4	3	2	1
9. Giving clear instructions to association members or employees on what to do to effectively implement the association's project/activity/business	4	3	2	1	4	3	2	1
10.Clear supervision and coaching by association officers	4	3	2	1	4	3	2	1
11.Making necessary adjustments in the execution of association activities when needed	4	3	2	1	4	3	2	1
D. Controlling								
1. Seeing to it that the plans are being adhered to by the association officers and members/workers.	4	3	2	1	4	3	2	1
2. Proper scheduling of the association's activities	4	3	2	1	4	3	2	1
1. Disciplining the members if they do not perform as expected.	4	3	2	1	4	3	2	1

2. Setting performance standards	4	3	2	1	4	3	2	1
3. Measuring or assessing actual performance of the association and its officers and members	4	3	2	1	4	3	2	1
4. Comparing actual performances with the standards	4	3	2	1	4	3	2	1
5. Analyzing deviations of the association's and its members' performance from that of the standards	4	3	2	1	4	3	2	1
6. Taking corrective actions to the deviations	4	3	2	1	4	3	2	1

Personal Entrepreneurial Competencies (PEC) Questionnaire

Instructions

1. This questionnaire consists of 55 brief statements. Read each statement and decide how well it describes you. Be honest about yourself. Remember, no one does anything very well, nor is it even good to do everything very well.
2. Select one of the numbers below to indicate how well the statement describes you:

5 - Always
4 - Usually
3 - Sometimes
2 - Rarely
1 - Never

3. Write the number you select on the line to the left of each statement. Here is an example:
__2__ - I remain calm in stressful situations
The person who responded to the item above wrote a "2" to indicate that the statement describes him very little (the person is rarely calm in stressful situations).
4. Some statements may be similar but no two are exactly alike.
5. Please answer all questions without exception!

PEC Self Rating Questionnaire

_____1. I look for things that need to be done.

_____2. When faced with a difficult problem, I spend a lot of time trying to find a solution.

_____3. I complete my work on time.

_____4. It bothers me when things are not done very well.

_____5. I prefer situations in which I can control the outcomes as much as possible.

_____6. I like to think about the future.

_____7. When starting a new task or project, I gather a great deal of information before going ahead.

_____8. I plan a large project by breaking it down into smaller tasks.

_____9. I get others to support my recommendations.

_____10. I feel confident that I will succeed at whatever I try to do.

_____11. No matter whom I'm talking to, I'm a good listener.

_____12. I do things that need to be done before being asked to do so by others.

_____13. I try several times to get people to do what I would like them to do.

_____14. I keep the promise I make.

_____15. My own work is better than that of other people I work with.

_____16. I don't try something new without making sure I will succeed.

_____17. It's a waste of time to worry about what to do with your life

_____18. I seek the advice of people who know a lot about the tasks I'm working on.

_____19. I think about the advantages and disadvantages or different ways of accomplishing things.

_____20. I do not spend much time thinking about how to influence others.

_____21. I change my mind if others disagree strongly with me.

_____22. I feel resentful when I don't get my way.

_____23. I like challenges and new opportunities.

_____24. When something gets in the way of what I'm trying to do, I keep on trying to accomplish what I want.

_____25. I am happy to do someone else's work if necessary to get the job done on time.

_____26. It bothers me when my time is wasted.

_____27. I weigh my chances of succeeding or failing before I decide to do something.

_____28. The more specific I can be about what I want out of life, the more chance I have to succeed.

_____29. I take action without wasting time gathering information.

_____30. I try to think of all the problems I may encounter and plan what to do if each problem occurs.

_____31. I get important people to help me accomplish my goals.

_____32. When trying something difficult or challenging, I feel confident that I will succeed.

_____33. In the past I have had failures.

_____34. I prefer activities that I know well and with which I am comfortable.

_____35. When faced with major difficulties, I quickly go on to other things.

_____36. When I'm doing a job for someone, I make a special effort to make sure that the person is happy with my work.

_____37. I'm never entirely happy with the way in which things are done; I always think there must be a better way.

_____38. I do things that are risky.

_____39. I have a very clear plan for my life.

_____40. When working for a project for someone, I ask many questions to be sure I understand what the person wants.

_____41. I deal with problems as they arise rather than spend time to anticipate them.

_____42. In order to reach my goals, I think of solutions that benefit everyone involved in the problem.

_____43. I do very good work.

_____44. There have been occasions when I took advantage of someone.

_____45. I try things that are very new and different from what I have done before.

_____46. I try several ways to overcome things that get in the way of reaching my goals.

_____47. My family and personal life are more important to me than work deadlines I set for myself.

_____48. I do not find ways to complete tasks faster at work and at home.

_____49. I do things that others consider risky.

_____50. I am as concerned about meeting my weekly goals as I am for my yearly goals.

_____51. I go to several different sources to get information to help with tasks or projects.

_____52. If one approach to a problem does not work, I think of another approach.

_____53. I am able to get people who have strong opinions or ideas to change their minds.

_____54. I stick with my decisions even if others disagree strongly with me.

_____55. When I don't know something, I don't mind admitting