IMPACT EVALUATION OF THE AGRI-PINOY LIVESTOCK PROGRAM (A-PLP) IN SAMAR ISLAND

FINAL REPORT






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PALO, LEYTE

APRIL 2020

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ACRONYMS

4Ps	Pantawid Pamilyang Pilipino Program
ACIAR	Australian Center for International Agricultural Research
ADC	Animal Dispersal Contract
AEW	Agricultural Extension Worker
AFMA	Agriculture and Fisheries Modernization Act
AI	Artificial Insemination
AIRP	Animal Infusion and Restocking Program
AMAD	Agribusiness Marketing and Assistance Division
A-PLP	Agri-Pinoy Livestock Program
ATT	Average Treatment Effect on the Treated
BCA	Benefit-Cost-Analysis
BCR	Benefit-Cost Ratio
CGE	Computable General Equilibrium
DA	Department of Agriculture
DA RFO8	Department of Agriculture Regional Field Office 8
DENR	Department of Environment and Natural Resources
DID	Difference-In-Difference
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
FAO	Food and Agriculture Organization
FMD	Foot and Mouth Disease
FSTP	Farmer-Scientists Research, Development and Extension Training Program
ESETS	Extension Support, Education and Training Services
Hemosep	Hemorrhagic Septicemia
HLPE	High Level Panel of Experts
IE	Impact Evaluation
IRP	Invoice-Receipt for Property
IRR	Internal Rate of Return
IEC	Information, Education and Communication
ISS	Information Support Services
KASA	Knowledge, Attitude, Skills and Aspirations
LAM	Livestock Auction Market
LIS	Livestock Information System
LGU	Local Government Unit
LN2	Liquid Nitrogen
LPC	Livestock Production Center
MBC	Municipal Breeding Center
MBLP	Male Breeder Loan Program
MFO	Major Final Output
M&E	Monitoring and Evaluation
MSC	Most Significant Change
NDA	National Dairy Authority
NEDA	National Economic and Development Authority
NGP	National Greening Program
NPV	Net Present Value

OMAS	Office of the Municipal Agricultural Services
PAIC	Provincial Artificial Insemination Coordinator
PAO	Provincial Agriculture Office
PCAARRD	Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development
PCC	Philippine Carabao Center
PCIC	Philippine Crop Insurance Corporation
PEC	Personal Enterpreneurial Competencies
PFPAS	Policy Formulation, Planning and Advocacy Services
PIDS	Philippine Institute for Development Studies
Phil-AHIS	Philippine Animal Health Information System
PhP	Philippine Pesos
PSA	Philippine Statistics Authority
PSM	Propensity Score Matching
PSS	Policy Support Services
PVO	Provincial Veterinary Office
RADDL	Regional Animal Disease Diagnostic Laboratory
RFAL	Regional Feed Analysis Laboratory
R&D	Research and Development
RMFP	Rural Microfinance Project
SAIS RED	Samar Island Small Ruminant Enterprise Development
SAIS REGAIN	Samar Island Rural Enterprise Goat Association Integrated Network
SJES	San Jorge Experiment Station
SMES	Salcedo Municipal Experiment Station
STBF	Science and Technology-Based Farms
TGP	Techno-Gabay Program
UMMB	Urea-Mollases Mineral Blocks
UNAIP	Unified Artificial Insemination Program
VBAIT	Village-Based Artificial Insemination Technician
VSU	Visayas State University

EXECUTIVE SUMMARY

This report presents the results of an impact evaluation of the Agri-Pinoy Livestock Program (A-PLP) that was implemented by the Department of Agriculture Regional Office VIII (DA-RFO8) in Samar Island. The impact evaluation was done to achieve the following objectives: (1) examine how A-PLP projects have: (a) ensured food security, (b) affected livestock farmers'/households' income and productivity, (c) improved livestock and poultry production, (d) supported market development and competitiveness of livestock farmers, and (e) capacitated DA-RFO8 in the delivery of market-oriented and productivity-enhancing services; (2) assess the attainment of the program development objectives, results components and major final outputs; (3) determine the economic, social and environmental impact of the A-PLP, including production and market development of the livestock industry; (4) appraise the status of adoption and/or modification of delivery services as well as implementation covenants by DA-RFO8; and (5) examine the effectiveness of DA-RFO8 in undertaking joint investments, market-oriented infrastructure and upgraded livestock technology projects with LGUs and private companies.

Mapping of the project inputs to project benefits was done following the impact assessment framework of Davis *et al*. (2008). Both primary and secondary data were utilized. Primary data were collected through focus group discussions with project implementers, key informant interviews, site visitation/ocular inspection, and in-depth survey of both project beneficiaries and non-beneficiaries across provinces using pre-tested interview schedule. The evaluation dealt primarily with the four major components of the A-PLP, namely: Unified National Artificial Insemination Program (UNAIP), Male Breeder Loan Program (MBLP), Samar Island Small Ruminant Enterprise Development (SAIS RED) Project, and Animal Infusion and Restocking Program (AIRP). The non-beneficiaries served as the control/counterfactual group. A total of 132 UNAIP beneficiaries and 120 non-beneficiaries (carabao raisers) were included in the survey. From these respondents, 50 randomly selected samples from each group participated in providing input-output data and other information *before* UNAIP implementation. For SAIS RED, a total of 117 goat raisers were randomly surveyed (58 beneficiaries and 59 non-beneficiaries). In addition, 21 MBLP and 50 AIRP beneficiaries were surveyed.

Innovative quantitative and qualitative approaches were employed in estimating the impact of the A-PLP in Samar Island. The quantitative techniques included propensity score matching (PSM), difference-in-difference (DID) method and benefit-cost analysis (BCA). On the other hand, analysis of most significant change (MSC) stories was employed to identify qualitative indicators of project outcome/impact.

The A-PLP engaged in activities aimed at developing the livestock industry in Samar Island. These activities involved achieving two Major Final Outputs (MFOs) of providing: (1) technical support services, and (2) agricultural equipment and facilities. To attain these outputs, the A-PLP implemented the following services and interventions: (a) production support services, (b) marketing development services, (c) extension support, education and training services (ESETS), (d) research and development, (e) regulatory services, (f) information support services, and (g) policy formulation, planning and advocacy services. The DA-RFO8 invested about PhP117 million (nominal value) in implementing the various A-PLP strategies for Samar Island from 2011–2016. This is

equivalent to PhP127 million and PhP160 million in real and present values, respectively. The bulk of investment (more than 92%) was incurred on technical support services, about half of which was devoted to production support services.

The production support services included operation of two Livestock Satellite Stations, genetic improvement program, pasture development, and animal health program. The genetic improvement program aimed to improve the production and reproduction potential of local animals. This was done by the introduction of superior quality genetic materials through the UNAIP and MBLP. Meanwhile, the AIRP was implemented by the A-PLP to increase livestock inventory in Samar Island. Two schemes were involved: (1) regular program that usually consisted of direct distribution of animals by DA-RFO8 to the recipients and (2) fund transfer for LGUs to procure the animals for distribution to identified beneficiaries. The A-PLP also introduced and distributed improved pasture and forage materials. Moreover, the A-PLP aimed to prevent and control animal diseases/parasites to assure attainment of improved animal production and reproduction performance by providing drugs and biologics, animal disease surveillance and disease diagnosis.

Another strategy employed in the implementation of the A-PLP was the provision of Marketing Development Services in the form of: (a) market assessment, survey and matching; (b) upgrading of livestock auction markets; (c) agribusiness investment forum; (d) seminar on livestock production/slaughter house operation; and, (e) provision of digital weighing scale. It also supported capability building for Agricultural Extension Workers (AEWs), distributed information, education and communication (IEC) materials and provided incentives to devolved AEWs.

The research and development initiative of the A-PLP in Samar Island centered on the SAIS RED project. Aside from capacity-building activities, the project introduced a basket of technology options on goat production to farmer-partners. These included housing, stall feeding, use of improved forage/pasture, urea-molasses mineral block (UMMB)/salt/concentrate supplementation, strategic deworming, and upgrading. It also facilitated the formation of farmer-partners into goat raisers' organizations and training on the operation and management of goat and allied enterprises.

Through its regulatory services, the A-PLP provided registration, licensing and accreditation as well as monitoring of groups and individuals engaged in the manufacture, distribution and sale of veterinary drugs, feeds, livestock and poultry products. In addition, it provided information support services that involved the installation and maintenance of two Livestock Information Systems (LIS): (1) Philippine Animal Health Information System (Phil-AHIS) and (2) UNAIP e-Reporting System. Moreover, through the A-PLP, the DA-RFO8 engaged in Quick Response to Emergencies and consultation with stakeholders.

The A-PLP supported the animal multiplier facilities established in various LGUs across Samar Island by infusing and restocking these with animals. Aside from animal infusion and restocking into multiplier facilities, the A-PLP also provided some LGUs with equipment needed in the implementation of some aspects of the program.

The A-PLP has addressed the issue of ensuring food security by improving the productivity of existing livestock that contributed to ensuring the availability, accessibility and affordability of livestock products. It has also increased the farm income of livestock raisers, improved farmers' knowledge on livestock raising, and contributed to improved efficiency of feed utilization thereby reducing input waste and environmental pollutants. Moreover, the program has provided learning opportunities to the DA-RFO8 in the delivery of market-oriented and productivity enhancing services. Furthermore, it allowed the DA-RFO8 to demonstrate considerable effectiveness in undertaking joint investments and upgraded livestock technology projects with LGUs and private companies.

Table 1 summarizes the major findings on program outcomes and impacts, conclusion and recommendations to sustain the gains and benefits from the A-PLP. Agencies and entities that are concerned with the recommendations are also cited.

Table 1. Major findings, conclusions and recommendations based on the impact evaluation of A-PLP in Samar Island

Finding	Conclusion	Recommendation	Concerned Agency
The A-PLP provided technical support services and agricultural equipment and facilities in order to support the development of the livestock industry in Samar Island. One of its main technical support services was production support services. The production services primarily engaged in genetic improvement and production farm development. Genetic improvement activities involved two practical methods for improving production potential among livestock, namely through: (1) natural breeding through the Male Breeder Loan Program (MBLP), and (2) artificial breeding through the Unified Artificial Insemination Program (UNAIP). The production farm development through the Livestock Production Centers (LPCs) in Salcedo and Gandara enabled availability of vital inputs not only for the animal infusion and pasture development program, but also for the male breeder loan and artificial insemination programs.	The production support services has addressed the issue of food security by improving productivity of existing livestock through genetic improvement and production farm development activities. The LPCs have served to assure sustained availability of quality breeder animals and AI skills (through the farm workers taking the lead in AI services provision and capability building of local technicians). The production farms have also served as vital sources of planting materials for pasture development, which was undertaken to assure availability of adequate feed to support increased animal number and production potential.	Sustain the operation of the LPCs and provide adequate support (financial and manpower) to the reactivation of LPCs in Samar Island.	Dept. of Agriculture RFO8 Provincial Local Government Units (PLGUs) Provincial Agriculture Offices Provincial Veterinary Offices

The UNAIP demonstrated benefits to the carabao raisers. Successful artificial AI produced better quality offspring (better growth and milk production), resulting to significantly higher net income by PhP11,000 per carabao. The increase in income and productivity due to AI was supported by the most significant change stories of the beneficiaries. Success of AI services was positively and significantly influenced by education of carabao raisers, use of natural heat, process of insemination, and follow up visits by AI technicians. However, there was low participation rate of LGUs in the UNAIP (36% of total number of LGUs) that resulted to a low proportion of the carabao population being inseminated (2.7%) and low success rate (7% of inseminated animals). Despite this, the program was found to be a profitable investment by the A-PLP in Samar Island. The major constraints to sustained adoption of AI were heat detection as well as availability of AI technician and semen.	AI in carabaos demonstrated significant positive impact on farmers' farm income and productivity. Such impact was also recognized by the carabao raisers as a significant change brought about by the project. AI enabled increase in productivity of individual carabaos. This indicates that the AI activity improved efficiency of farm and household resource utilization. Despite the low adoption and success rates of AI due to inadequate participation of stakeholders, the UNAIP has been a profitable investment in Samar Island.	Scale up adoption and implementation of AI services by involving more stakeholder raisers, LGUs and agencies (by expanding the reach of advocacy activities and other strategies like clustering of adjacent localities). Improve and assure proper implementation of protocols for availment of AI services (e.g. follow-up visits). Provide support for training and mentoring of more Village-Based AI Technicians (VBAIT).	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal – Barangay Agriculture and Veterinary Service Offices – Provincial – City/Municipal Philippine Carabao Center (PCC) National Dairy Authority (NDA)

Another program that aimed to support genetic improvement of livestock was the MBLP. However, compliance of the procedure in the availment of male breeder loan was very low. Only a third of the 21 male breeder animals were able to serve female animals. Most of the animals were either sold, slaughtered or died.	The MBLP was not able to demonstrate considerable impact due to some implementation issues.	Review and improve the procedure in identifying the right beneficiaries and ensuring adequate understanding of roles/responsibilities by stakeholders of the program. Implement regular monitoring and provide necessary follow-up support to MBLP beneficiaries.	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal – Barangay Agriculture and Veterinary Service Offices – Provincial – City/Municipal
The A-PLP's research and development activity in Samar Island activity focused on the Samar Island Rural Enterprise Development (SAIS RED) project. The project significantly increased by four heads the number of animals raised by the goat raisers. Emergence of positive outcomes in terms of adoption of new goat raising technologies, production of better-quality offspring, increased volume of milk produced from crossbred goats, emergence of goat enterprises, and improvement in some personal entrepreneurial competencies (PEC) of beneficiaries. Less than half (44%) of the SAIS RED organizations monitored were active. The inactivity of most organizations was due to absence of sustaining activities after project implementation.	The SAIS RED R&D activity has been a modality that helped address food security issues by building up entrepreneurial capability among goat raisers. The project has enabled goat raisers to increase the number of animals raised in their farms. The project has started to demonstrate improvement in productivity and competitiveness of livestock farmers in Samar Island. Moreover, it has demonstrated improvement in capability of goat raisers both in terms of production and entrepreneurial skills.	Revive/capacitate the organizations as they can provide support in enhancing the emergence of goat enterprises and further developing the PEC of goat raisers. Involve more stakeholder raisers, LGUs and other agencies.	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal – Barangay Agriculture and Veterinary Service Offices – Provincial – City/Municipal National Dairy Authority

Aside from animal infusion and restocking program (AIRP) of multiplier farms, the A-PLP also engaged in animal infusion to livestock farmers affected by Super Typhoon Haiyan. The livestock species infused included carabao, cattle, goat, chicken, and swine. Implementation of the program was delayed due to procurement issues. Implementation issues (e.g. beneficiary selection and preparation) affected performance of some infused animals. Emergence of positive outcomes (e. g. 181 beneficiaries of re-dispersal of swine, significantly higher income by PhP11,000 per household generated from swine production). This increase in income was also supported by the most significant change stories of the beneficiaries.	The AIRP has likewise addressed food security by providing replacement animals after the massive animal losses brought about by a major calamity that affected Samar island (Typhoon Haiyan). This activity of the A-PLP has enabled significant increase in the net income from swine production of swine raisers. Such increased income was considered a significant change experienced by the swine raisers.	Evolve policies to facilitate procurement of inputs (mainly animals) and assure timely as well as proper implementation of AIRPs. Revive/reactivate and provide adequate support to the LPCs in Samar Island and Eastern Visayas.	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal – Barangay Agriculture and Veterinary Service Offices – Provincial City/Municipal

Only a limited number of market development services in Samar Island were implemented because the scale of livestock production in Samar Island was considered inadequate to warrant successful market development. In terms of market-oriented infrastructure, the DA-RFO8 has provided LGUs with three digital weighing scale. However, the agency was not able to evaluate and influence the LGUs on matters related to ensuring functionality of all the units after provision. Hence, only one digital weighing scale was functional. The other was functional for only a year and was damaged during the renovation of the slaughter house. The remaining unit was unutilized.	The A-PLP has provided limited activities to support market development and competitiveness of livestock farmers in Samar Island. The main reason was that the scale of livestock production in the island was still low (almost totally backyard or subsistence). In this case, the most appropriate intervention was to first increase the scale of production, coupled with a few relevant market development activities. The A-PLP has provided market-oriented infrastructure in terms of digital weighing scales to help raisers obtain a fair market value of their animals. However, inadequacy of support mechanisms for the proper utilization of the weighing scales was experienced, hence effectiveness of said infrastructure has not been fully demonstrated. Addressing these would provide considerable impact to this intervention, and serve as preparation/transition point for the increased scale in production.	Evolve appropriate services and activities that support market development opportunities for smaller-scale production systems and enhance competitiveness of livestock farmers in Samar Island. Immediate repair of the digital weighing scale in Dolores, Eastern Samar and installation of the unit in Calbayog City.	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal Agriculture and Veterinary Service Offices – Provincial – City/Municipal Department of Trade and Industry (DTI)

The animal health program of A-PLP was successful in maintaining the FMD-free status in the Region, in general and in Samar Island, in particular. However, it was not able to demonstrate its impact on mortality and morbidity rates due to other diseases.	The animal health program needs to be more responsive to emerging issues and problems.	Increase involvement of stakeholders to strengthen animal health monitoring system, enabling timely identification of disease/parasite occurrence and appropriate animal health interventions. Strengthen advocacy on the prevention and control of common economically important diseases like Foot and Mouth Disease (FMD) and Hemorrhagic septicemia (HemoSep).	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal – Barangay Agriculture and Veterinary Service Offices – Provincial City/Municipal
The A-PLP provided capability-building activities to the Agricultural Extension Workers (AEWs). The AEWs considered the trainings provided as effective and adequate; however, the incentives provided were considered effective but inadequate.	Trainings and incentives for AEWs provided by A-PLP were effective; however, the AEWs felt that the incentives were inadequate.	Sustain provision of training/capability building for AEWs. Improve incentive system for AEWs.	Dept. of Agriculture RFO8 Local Government Units (LGUs) – Provincial – City/Municipal Agriculture and Veterinary Service Offices – Provincial – City/Municipal

The implementation by the DA-RFO8 of A-PLP activities was facilitated by partnership with Local Government Units (LGUs) and private entities. The implementation covenant was covered by a Memorandum of Agreement (MOA) between the DA-RFO8 and concerned LGUs/organizations. The DA-RFO8 has generally performed its roles and responsibilities. However, it was found weak in monitoring and evaluation of project activities. This was attributed to lack of manpower considering the scope of coverage and distance of project sites. Aside from the issue on adequate and timely project monitoring, selection of beneficiaries by the LGUs and assuring commitment of stakeholders were critical.	The DA-RFO8 has generally performed its roles and responsibilities in terms of adoption of delivery services and implementation covenants. However, improvement is needed in the monitoring and evaluation of most collaborative undertakings with LGUs. Adequate manpower and skills are required to cater to the scope of coverage and area covered by project sites.	Invest on manpower and other resources needed to assure adequate monitoring and evaluation of project activities.	Dept. of Agriculture RFO8

The main partners of the DA-RFO8 in implementing the A-PLP were the LGUs at the provincial, city or municipal level. Its involvement with agriculture and veterinary offices has allowed the DA-RFO8 to acquire considerable skill in partnering with these entities. The sustainability of partnerships with LGUs especially with the implementation of long-term projects has been challenged when a different set of LGU officials get elected. Although quite limited, the A-PLP through its R&D activity provided the DA-RFO8 to engage with private entities. Said partnership was effective.	The DA-RFO8 has also demonstrated considerable effectiveness in undertaking joint investments and upgraded livestock technology projects with LGUs and private entities during the A-PLP. Given the diverse environment and circumstances among LGUs and private companies, most of the undertakings still have room for improvement. A major need is to identify and implement undertakings that have relevance at the local, provincial, regional and national levels.	Invest on manpower and other resources needed to assure sustainability of partnerships with LGUs.	Dept. of Agriculture RFO8
Most of the technologies and activities implemented by the A-PLP have demonstrated benefits to adopters. However, the accomplishment in terms of adoption rate in relation to the whole Island has considerable potential to increase. Attainment of program development objectives, results components and major final outputs are still modest in relation to the whole Samar Island.	There is considerable potential and need for DA-RFO8 to scale-up/increase the adoption rate of its livestock technologies and activities.	Increase capacity to assume a coordinative role in scaling-up beneficial technologies and activities.	Dept. of Agriculture RFO8

CHAPTER I
INTRODUCTION

1.1 Project Background

Poverty and food insecurity are prevalent problems that beset developing agricultural countries like the Philippines. These problems are usually attributed to low farm productivity, which lead to low income of farm households. To help address these problems, the government implements programs that aimed to achieve growth and development. Among these is the Agri-Pinoy Livestock Program (A-PLP).

Livestock plays an important role in achieving sustainable agricultural development, poverty reduction and food security (FAO 2009) as well as adequate nutrition (HLPE 2016). Other than that, livestock production provides food, employment or livelihood, and income to farmers (Parente & Van de Weerd 2012; FAO 2009; Sinclair 2014). In addition, livestock serves as valuable asset, store of value, collateral for credit, and safety net during times of crisis (FAO 2009; Baltenweck &Galie 2015). Moreover, livestock provides manure, which plays an important role in soil fertility amendment for crop production (Parente & Van de Weerd 2012; Baltenweck &Galie 2015).

Livestock contributes 16% to 17.5% to the gross output in agriculture of the Philippines from 2011 to 2018 (PSA, 2016; PSA, 2019). In the Eastern Visayas Region, however, the contribution of livestock may be underestimated because these species are raised in backyard systems and for purposes other than commercial meat production. The major livestock species in the region is carabao, followed by hogs and goats, as indicated by their contribution to the country's livestock production in the last 10 years (2009 to 2018) (PSA, 2010 to 2019). Carabaos are used mainly to provide draft for crop production, while hogs and goats are raised in small scale, low-input systems and for local consumption.

Livestock development programs and policies have been implemented in Eastern Visayas in an effort to achieve change outcomes. These come mainly in the form of improving profit, raising incomes, improving learning/competence on production or increasing access to basic services. Whether or not these changes are actually achieved is a crucial policy question.

A relevant method of determining whether or not changes have been achieved by development programs and policies is impact evaluation (IE). IE is vital in determining whether a 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 provides 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. Results of IE studies are used by policy makers and funding/donor agencies for scaling up existing projects and approval of future similar developmental projects. Moreover, impact evaluations are part of a broader agenda of evidence-based policy making.

The National Economic and Development Authority (NEDA) recognizes the importance of monitoring and evaluation (M&E) as a vital tool in governance. M&E are at the heart of evidence-based policy making. They provide a core set of tools that stakeholders as well as decision/policy makers can use to verify the quality, efficiency and effectiveness of any development project or policy. With this, NEDA has facilitated the conduct of impact evaluation on the Agri-Pinoy Livestock Program (A-PLP).

The A-PLP was implemented by the Department of Agriculture Regional Field Office VIII (DA-RFO8) in all six provinces of Eastern Visayas. This study focuses on assessing the outcomes/impacts of the A-PLP only in Samar Island. It covers the program components/services implemented from mid–2010 to 2016 in the cities and municipalities within the provinces of Samar, Eastern Samar and Northern Samar.

This report presents the findings relative to the inputs and outputs of A-PLP, program impacts as revealed by the beneficiaries' stories of change, as well as quantitative data analysis of project outcomes and impacts.

1.2 Objectives of the Impact Evaluation

Following the Terms of Reference with NEDA Regional Office VIII (NRO8), this project aimed to conduct an impact evaluation of the A-PLP in the Island of Samar. Specifically, it aimed to:

1. Examine how A-PLP projects: (a) ensured food security, (b) affected livestock farmers'/ households' income and productivity, (c) improved livestock and poultry production, (d) supported market development and competitiveness of livestock farmers, and (e) capacitated DA-RFO8 in the delivery of market-oriented and productivity-enhancing services;
2. Assess the attainment of the program development objectives, results components and major final outputs;
3. Determine the economic, social and environmental impact of the A-PLP, including production and market development of the livestock industry;
4. Appraise the status of adoption and/or modification of delivery services as well as implementation covenants by DA-RFO8; and
5. Examine the effectiveness of DA-RFO8 in undertaking joint investments, market-oriented infrastructure and upgraded livestock technology projects with LGUs and private companies.

CHAPTER II
REVIEW OF LITERATURE

Impact assessment is important in determining the effects and impacts of a program or project intervention. These can be in terms 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 choice of methods and design of impact evaluation depends on the availability of resources and constraints, nature of project being evaluated and intended use of the evaluation (Rogers *et al*., 2015). Analytical methods employed can be quantitative, qualitative or both.

This section presents some of the impact assessment studies conducted and methods used in evaluating programs, projects or policies. 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. Meanwhile, 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 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 majority of the existing clients and the incoming clients were found to be not poor. For their part, Yorobe, Rejesus and Hammig (2011) controlled for endogeneity and selection problems by using instrumental variable procedures in assessing the insecticide use impacts of the Integrated Pest Management Farmer Field Schools among onion farmers in the Philippines. Moreover, Yorobe and Smale (2012) applied instrumental variable estimation in evaluating the impact of Bt maize adoption. Taking into account for self-selection and endogeneity, they found that adoption of Bt maize increased net farm income, off-farm income and household income.

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 on 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).

Other impact assessment studies employed propensity score matching. For example, Rejesus *et al*. (2011) used propensity score matching and regression-based approaches in evaluating the impacts of a controlled irrigation technique in rice production. In addition, Tutor (2014) assessed the impact of the conditional cash transfer program, also known as the *Pantawid Pamilyang Pilipino Program* (4Ps), on

consumption using average treatment effect on the treated (ATT) through propensity score matching methodology. Results showed that the program provided significant positive impact on education and clothing expenditures; however, it had no impact on health spending. The impact was more pronounced among the poorest (fifth class households.

Moreover, 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.

Other than these, 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 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 scenarios (Vista *et al.*, 2016). In addition to 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.

Meanwhile, the studies conducted by the Australian Centre for International Agricultural Research (ACIAR) and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) in assessing impacts of some research and development interventions in the Philippines employed economic surplus (welfare) and cost-benefit analyses. These are exemplified in the studies of Francisco *et al*. (2009) on stored grain pest management, Montes *et al*. (2008) on the management of parasites in goats, Gabunada *et al*. (2014) on environmentally-sound aquaculture techniques for prawn/shrimp, and Gabunada *et al*. (2011) on bamboo technology packages and production system. These studies found that the various research investments have been profitable and worthwhile. Using benefit-cost analysis, Zapata *et al*. (2014) further determined that the investments in the Rural Enterprise Development (RED) Through Innovative Goat Production System Project Phase I provided positive returns to the investments of PCAARRD and the participating LGUs. Similarly, Gabunada *et al*. (2019) found the investments of PCAARRD in the Science and Technology-Based Farms in the Visayas as worthwhile. The adoption of S&T innovations resulted to increased yield and higher income of farmers.

Furthermore, a farm-level impact assessment of PCAARRD's Techno-Gabay Program (TGP) across regions in the Philippines 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 in selected municipalities of Leyte (Gabunada *et al.* 2011), Central Luzon (Aveno *et al.* 2011), Western Mindanao (Narvaez and Narvaez

2011), Ilocos Region (Alimbuyuguen and Julian 2011), Catanduanes, Bicol (Mascariñas *et al.* 2011), Misamis Oriental (Laureto *et al.* 2011), Southern Mindanao (Bayacag *et al.* 2011), and Philippines (Aquino, Ani and Bandoles 2011).

In order to supplement the quantitative measures of impact, some studies also determined qualitative indicators using the stories of most significant change (MSC). Zapata *et al*. (2014) found that the RED project has benefitted the goat farmers through changes in knowledge and skills, management of goat farms and goat marketing. Meanwhile, Gabunada *et al.* (2015) showed that the analysis of the farmer-scientists' stories of significant change showed that the National Corn-Based Farmer-Scientists Research, Development and Extension Training Program has contributed to the improvement not only in the economic but also in the social conditions of the farmer-clients.

The aforementioned studies indeed reveal the relevance and effectiveness of doing Impact Evaluation in monitoring and evaluating developmental programs and policies. Hence, the current study is also using Impact Evaluation to assess the progress of A-PLP in Samar Island. With this, it hopes to add to the scholarship of Impact Evaluation in the national and international research discipline.

CHAPTER III
METHODOLOGY

3.1 Impact Assessment Framework

An impact assessment framework describes 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 out the evolution from project inputs to outcomes is necessary before quantifying the impacts.

Similar to the impact evaluation of the Agrarian Reform Infrastructure Support Project – Phase III, this study adapted the impact assessment framework of Davis *et al*. (2008). The first component of the impact assessment framework is the identification of project 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 can 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.* 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 second component is the determination of project outputs. These outputs are specific 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 adopted, project outputs would result in project outcomes. These outcomes can be in the form of changes in practice, product and policy. In identifying outcomes, the adoption pathways, levels of adoption and reasons that facilitated this adoption is assessed. This is important in order to explain that the achieved outcomes are really due to the technology adoption/project intervention.

Consequently, project outcomes would result 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, on the other hand, can be seen in the improvements or reduction in health and security conditions of the community. Meanwhile, environmental impact is observable in the changes in air, water quality and biodiversity. 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 by 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 adopted from Davis *et al.* (2008) and used in this study. The inputs of A-PLP include both cash and in-kind expenditures provided by the government through the Department of Agriculture Regional Office VIII (DA-RFO8) and counterpart investments of partner/collaborating agencies such as local government units (LGUs) that implemented the project and Philippine Carabao Center (PCC) in the implementation of the Unified National Insemination Program (UNAIP). In terms of outputs, the A-PLP was expected to generate three types: (1) technology/services, (2) capacity built, and (3) policy (regulatory) services. The A-PLP tried to achieve two major final outputs (MFOs): (a) technical support services and (b) provision of agricultural equipment and facilities. The technical support included the following services: (i) production support (engaged in genetic improvement, animal health and pasture development); (ii) market development; (iii) extension support, education and training; (iv) research and development; (v) regulatory; (vi) information support; and (vii) policy formulation, planning and advocacy.

Meanwhile, the capability development activities might have resulted to improved technical and entrepreneurial skills of livestock farmers and AEWs. Moreover, these could have translated to the formation of livestock raisers' associations. On the other hand, the regulatory services provided by the program enabled the registration, licensing and accreditation of feed establishments as well as outlets of veterinary drugs and products.

These program outputs were brought forward for the benefits of intended users/farmer-beneficiaries. For the A-PLP, these have been facilitated with various adoption pathways that included the following: (a) provision of breeder animals, semen straws, technical and entrepreneurial services; (b) partnership with LGUs, conduct of agribusiness investment forum, production and/or distribution of information, education and communication (IEC) materials, and conduct of farmers' field day; (c) capacity building through technical and entrepreneurial trainings, educational tour/*Lakbay-aral* and organizational development; and (d) enforcement of regulatory laws, inspection and quarantine services.

The adoption of program outputs resulted to outcomes. These outcomes are in the form of the following: (1) changes in practice and product, (2) social, and (3) policy. The program interventions and services improved the livestock management systems. These in turn were translated into higher birth and weaning weight of animals, faster growth rate, and improved quality of offspring. Meanwhile, capability development led to the empowerment of livestock farmers and AEWs, strengthening of farmers' organizations and improvement in the personal entrepreneurial competencies of farmers. On the other hand, the enforcement of regulation is expected to translate to availability of quality feeds and veterinary supplies in the market.

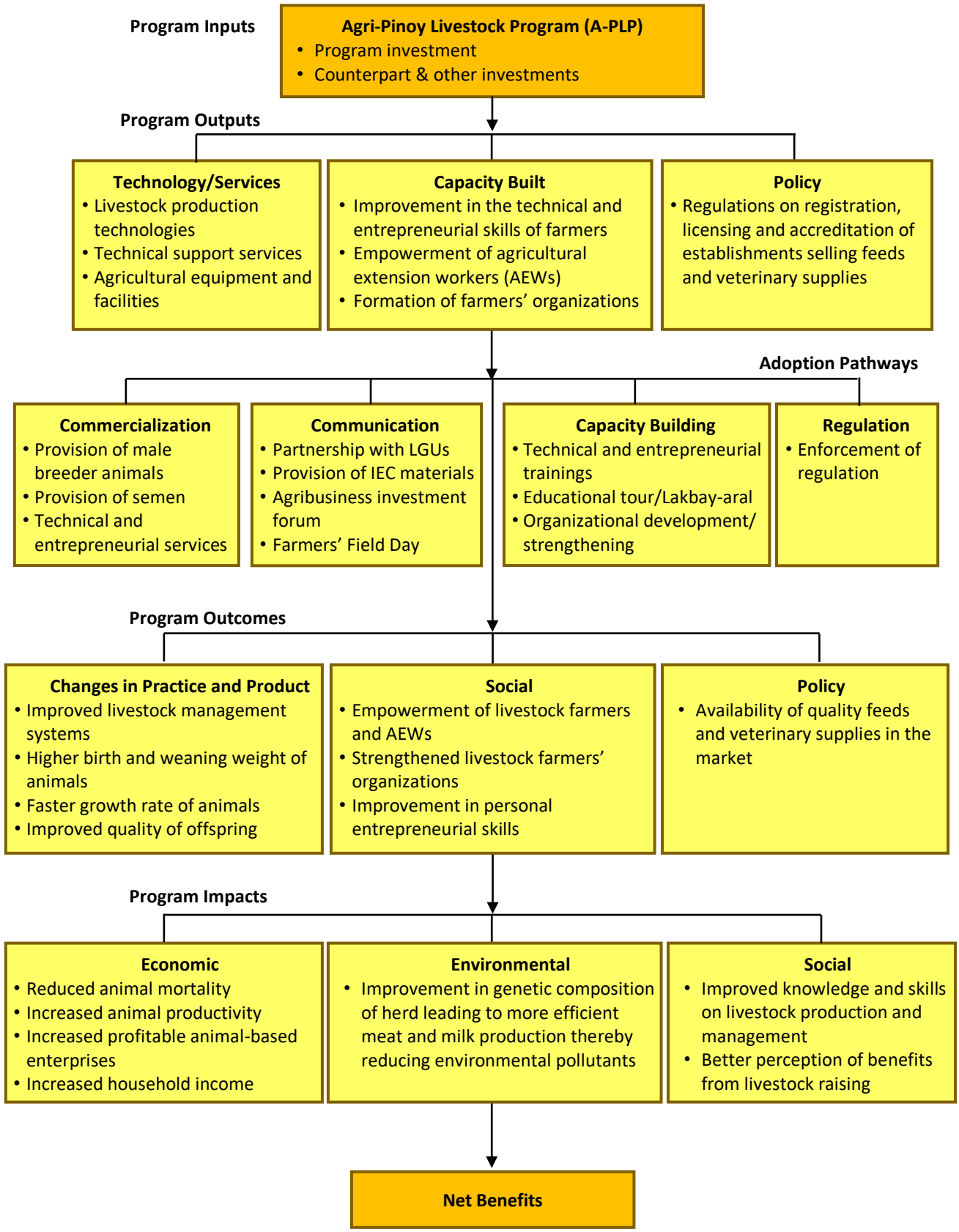


Figure 1. Conceptual framework for the impact evaluation of the A-PLP

The program impacts are results from changes in practices and products as well as social and policy outcomes. These are classified as follows: (1) economic, (2) environmental, and (3) social impacts. The economic impacts are in terms of reduced animal mortality and increased productivity, increased number of profitable animal-based enterprises, and increased household income. Meanwhile, the social impacts relate to improved knowledge and skills on livestock management and better perception of the benefits from livestock raising. On the other hand, the environmental impact is identified in terms of improvement in genetic composition of herd leading to the more efficient meat and milk production thereby reducing environmental pollutants.

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 project implementers, key informant interviews (KII), site visitations/ ocular inspection, and in-depth survey of both project beneficiaries and non-beneficiaries 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 in 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 A-PLP beneficiaries and non-beneficiaries of the following programs/projects: (1) Unified Artificial Insemination Program (UNAIP) on carabaos and (2) Samar Island Small Ruminant Enterprise Development (SAIS RED) Project. In addition, it was also conducted for the beneficiaries of the Male Breeder Loan Program (MBLP) and Animal Infusion and Restocking Program (AIRP). Hence, four sets of survey instruments were designed to collect primary data from sample farmer-respondents.

The survey made use of pre-tested interview schedules which were 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 study employed varying sampling procedures depending on the A-PLP component that was evaluated. These included both probabilistic and non-probabilistic sampling as well as complete enumeration.

3.3.1 Sampling Procedure for the UNAIP

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:

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

In this formula, 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 95% confidence interval, which suggests that the sample allows for certainty 95% of the time. The established Z-value for the 95% confidence interval is 1.96. Since there was no prior information available with regards to the population variance (σ^2), it 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 7.5% 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:

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

$$n_o = \frac{1.96^2(0.5)*(1-0.5)}{0.075^2} = 171 \text{ respondents}$$

Using the formula, the result suggests to survey 170 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:

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

In this formula, 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. It was assumed that the total number of UNAIP beneficiaries in the study sites is 847. Using the equation above, the estimated sample size for the study area was computed as follows:

$$n = \frac{171}{1+\frac{171}{847}} = 142 \text{ respondents}$$

Random sampling procedure was adopted using the MS Excel randomization scheme to make sure that everyone is given equal chance to be chosen as respondent.

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 142 beneficiary-respondents. However, upon initial data tabulation there were respondents with missing information and outlier values. To reduce the clutter in the survey, data cleaning was done to remove outliers (both extremely high and low values). After data cleaning, a total of 132 UNAIP beneficiaries were included in the analysis. In addition, a survey among non-beneficiaries was also conducted to serve as a comparison group. The randomly selected non-beneficiaries serve as a *without project scenario* or a proxy on what would have happened *without* the UNAIP interventaion. A random sample of 120 non-beneficiaries were interviewed across project sites. Figure 2 shows the map of the sites covered in this study.

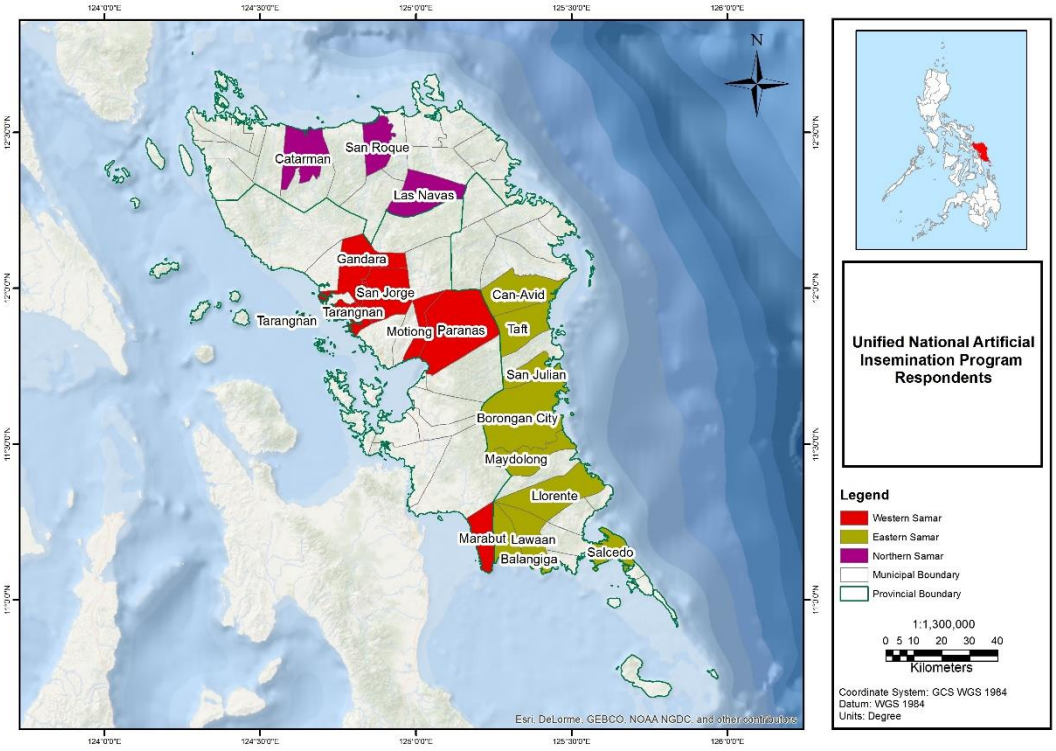


Figure 2. Map showing the location of the UNAIP respondents

In addition, input-output data and other information *before* and *after* A-PLP implementation were elicited from randomly selected 50 UNAIP beneficiaries and 50 non-beneficiaries included in the full survey.

3.3.2 Sampling Procedure for the SAIS RED Project

For the SAIS RED project, the number of listed beneficiaries was relatively few, hence, non-probabilistic sampling using Slovin's formula was adapted. With a total population of 135 SAIS RED beneficiaries and a margin of error at 10%, the computed sample size for the SAIS RED project was 58 respondents. A comparable sample size of

non-beneficiary respondents was also randomly selected to serve as comparison group. The beneficiaries were goat raisers who were directly or indirectly trained through the SAIS RED project while the non-beneficiaries were goat raisers who were not involved in said project.

Similarly, random sampling procedure was adopted using the MS Excel randomization scheme to make sure that everyone in the list was given equal chance to be selected as respondent. Alternative farmers were drawn in cases where the first selected respondent was not available or refused to participate in the survey. A total of 117 respondents were randomly surveyed for assessing the impact of the SAIS RED project in Samar Island. Figure 3 shows the municipalities covered in the survey across provinces in Samar Island.

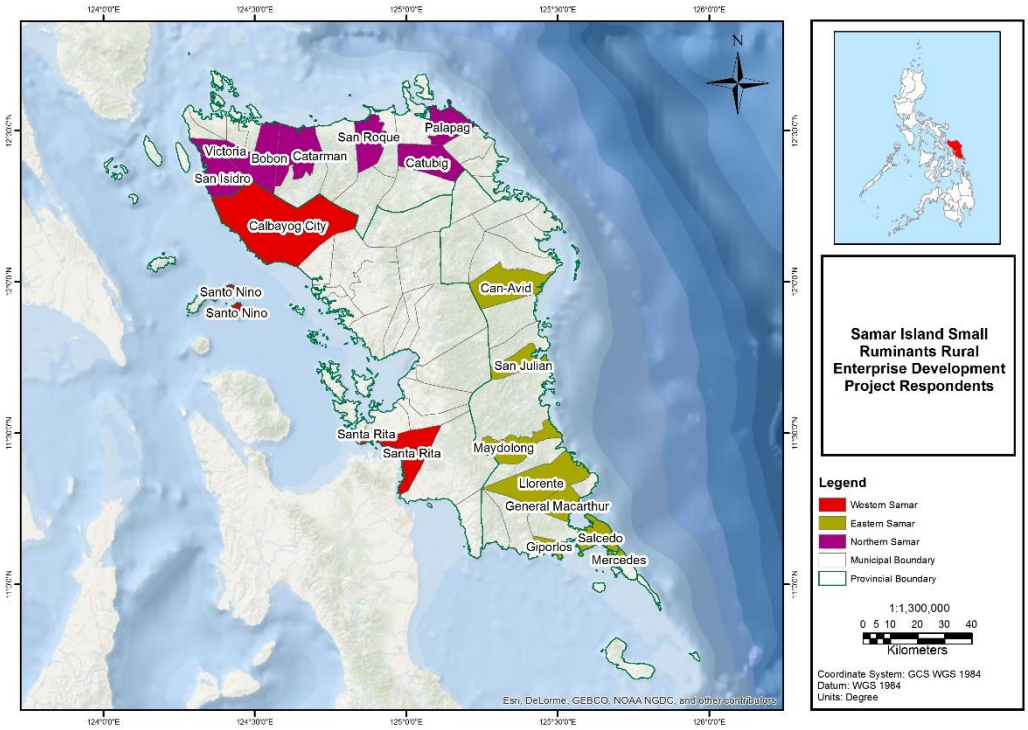


Figure 3. Map showing the location of the SAIS RED respondents

3.3.3 Complete Enumeration for the MBLP

No further sampling was employed in choosing the respondents for the Male Breeder Loan Program. This was due to the very limited number of available beneficiaries. Complete enumeration of the beneficiaries was done. From the list provided by DA-RFO8, only a total of 21 MBLP beneficiaries included in the survey were confirmed to have received male breeder animals. Figure 4 shows the municipalities covered in the survey across provinces in Samar Island.

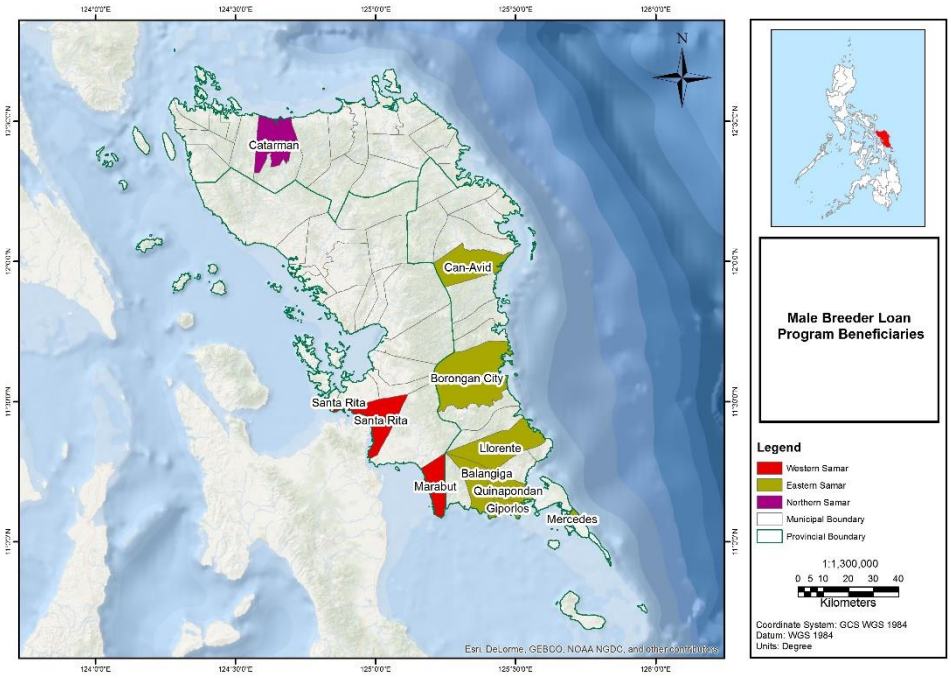


Figure 4. Map showing the location of the MBLP beneficiaries

3.3.4 Sampling Procedure for the AIRP

Funds for the AIRP were released by DA-RFO8 to the concerned LGUs across provinces in Samar Island from 2014-2015. However, the bulk of procurement and dispersal of animals were done only in 2016 and 2017. A considerable number of LGUs dispersed the animals only two to three years ago.

The list of beneficiaries was obtained from the Municipal Agriculture Offices of the respective LGUs. Random sampling was employed to identify the beneficiaries to be interviewed. It was based on the number of respondents that could support the intended statistical test, instead of a formal sample size computation.

A couple of problems beset the team in accessing the identified respondents. These include remote, mountainous locations with limited transportation facilities and security issues due to peace and order conditions in the areas. With this, only 50 beneficiaries were interviewed.

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 Agrarian Reform Infrastructure Support Project – Phase III, the quantification of A-PLP impacts

employed DID and PSM. Other analytical tools employed were adoption and profitability analyses as well as welfare and benefit-cost analyses. 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) 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 A-PLP 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 A-PLP. By doing this, the impact of the project can be estimated 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:

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

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 5 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 A-PLP project will relatively have a higher outcome as compared to the control group.

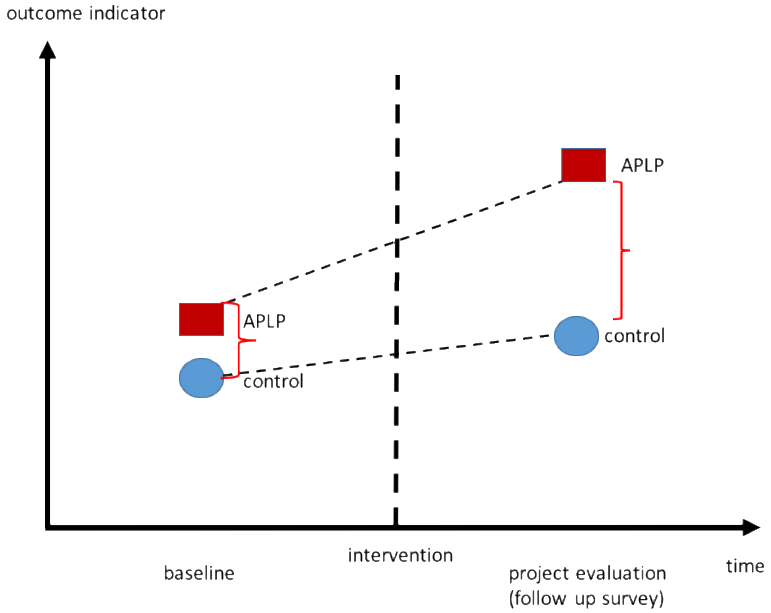


Figure 5. Difference-in-difference measurement

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 A-PLP 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 A-PLP 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 A-PLP in Samar Island. Ideally, experimental data will provide information on the counterfactual situation addressing the problem of causal inference. However, this is not the case in the three provinces across Samar Island. Hence, the study employed a cross-sectional household survey to document changes in farm income among beneficiary and non-beneficiary group of livestock raisers.

If the A-PLP 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 technological intervention for the whole sample is the weighted average of the effect of the two groups (treated and control group). But then again counterfactual is not observed. The problem can be solved through different estimation techniques. Assuming that the effectiveness of the A-PLP in improving income of farmer-beneficiaries in Samar Island 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 A-PLP. It might be valid to assume that there seems to be systematic differences between households who are beneficiaries of the program 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 household 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 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 evaluation of the UNAIP, the logit model of the following form was used:

$$P_i = E(Y_i = 1 \mid X) = 1 / (1 + e^{-z}) = ß_0 + ß_1 age + ß_2 male + ... + ß_{14} agasset + u_i \quad (5)$$

where

P_i	=	probability of a household being part of the treated group
E	=	expected value of being in the program given the covariates
Y	=	1 if a household is successful during artificial insemination and 0 otherwise (UNAIP)
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)
marriedhh	=	marital status (1 for married and 0 otherwise)
educhh	=	years of education for household head
educsp	=	years of education for spouse
hhsize	=	household size
waterdist	=	distance of households from the nearest water source (in kilometres)
farmarkdist	=	farm to market distance (in kilometres)
yrcarabaorais	=	years of carabao raising
farmsize	=	measures the farm area (in hectares)
ownfarm	=	dummy variable for farm ownership (1 if own farm and 0 otherwise)
memborg	=	member in organization (1 if member and 0 for non-member)
houseasset	=	asset index from pooling household durable goods
agricasset	=	asset index from pooling agricultural equipment or goods
u_i	=	remaining error term

For the SAIS RED project, similar logit form of the following form was used:

$$P_i = E(Y_i = 1 \mid X) = 1 / (1 + e^{-z}) = ß_0 + ß_1 age + ß_2 male + ... + ß_{14} agasset + u_i \quad (6)$$

where

P_i	=	probability of a household being part of the treated group
E	=	expected value of being in the program given the covariates
Y	=	1 if a household is classified as beneficiary and 0 otherwise
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)
educhh	=	years of education for household head
hhsize	=	household size
marriedhh	=	marital status (1 for married and 0 otherwise)
malehh	=	gender of household head (1 if male and 0 if female)
educsp	=	years of education for spouse
agesp	=	age of spouse
farmarkdist	=	farm to market distance (in kilometres)
yrgoatrais	=	years of goat raising
farmsize	=	measures the farm area (in hectares)
ownfarm	=	dummy variable for farm ownership (1 if own farm and 0 otherwise)
memborg	=	member in organization (1 if member and 0 for non-member)
houseasset	=	asset index from pooling household durable goods
waterdist	=	distance of households from the nearest water source (in kilometres)
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 Assessment of Personal Entrepreneurial Competencies

Some capability building activities were provided by the SAIS RED project implementers to the farmer-partners on entrepreneurship concepts, principles and

strategies. These were aimed to empower the beneficiaries in the operation and management of goat-based enterprises.

This study adopted the procedures employed by Zapata *et al.* (2014) in assessing the Personal Entrepreneurial Competencies (PECs) between SAIS RED beneficiaries and non-beneficiaries using a modified PEC questionnaire. From the original 55 questions, the study used only 35 questions involving six competencies as follows: (1) demand for quality and efficiency, (2) opportunity-seeking, (3) risk-taking, (4) persuasion and networking, (5) information-seeking, and (6) systematic planning and monitoring.

The farmer-respondents were requested to rate their respective competencies with the use of the PEC questionnaire. A rating scale was used to answer the questions that correspond to the above-mentioned competencies as follows: 5 – always, 4 – usually, 3 – sometimes, 2 – rarely, and 1 – never. Table 2 shows the corresponding behavioral indicators for each of the six PECs.

Table 2. Selected Personal Entrepreneurial Competencies (PECs) and their corresponding behavioral indicators

Personal Entrepreneurial Competencies	Behavioral Indicators
Demand for Efficiency and Quality	• Finds ways to do things better, faster or cheaper • Acts to do things that meet or exceed standards of excellence • Develops or uses procedures to ensure work is completed on time or that work meets agreed upon standards of quality
Opportunity Seeking and Initiative	• Does things before being asked or forced to by events • Acts to extend the business into new areas, products or services • Seizes unusual opportunities to start a new business, obtain financing, equipment, land work space or assistance
Risk Taking	• Deliberately calculates risks and evaluates alternatives • Takes action to reduce risks or control outcomes • Places self in situations involving a challenge or moderate risk
Persuasion and Networking	• Uses deliberate strategies to influence or persuade others • Uses key people as agents to accomplish own objectives • Acts to develop and maintain business contracts
Information Seeking	• Personally seeks information from clients, supplier or competitors • Does personal research on how to provide a product or service • Consults experts for business or technical advice

Systematic Planning and Monitoring	• Plans by breaking large tasks down into time-constrained sub-tasks • Revises plans in light of feedback on performance or changing circumstances • Keeps financial records and uses them to make business decisions

Adapted from Zapata *et al.* (2014)

The PEC scores between beneficiaries and non-beneficiaries were compared using T-Test for Independent Samples. Moreover, the mode PEC scores were classified as being strong (19 points and above), moderate (16-18 points) and weak (15 points and below).

3.4.4 Welfare Analysis

The benefits from adopting the artificial insemination technology on carabaos were estimated using standard welfare (economic surplus) analysis. Figure 6 shows a static supply and demand model. Initial equilibrium occurs at price, P_0 and quantity, Q_0. The impact of the technology is modeled as a reduction in the unit cost of producing a kg of carabao meat of *ac* pesos at the initial equilibrium level of production, Q_0. If the technology results in cost saving of *ac* pesos for all units of production, the supply curve shifts (*k*) rightward from S_0 to S_1. This results to increased farm live-weight production from Q_0 to Q_1 and a fall in the farm level price of carabao meat from P_0 to P_1.

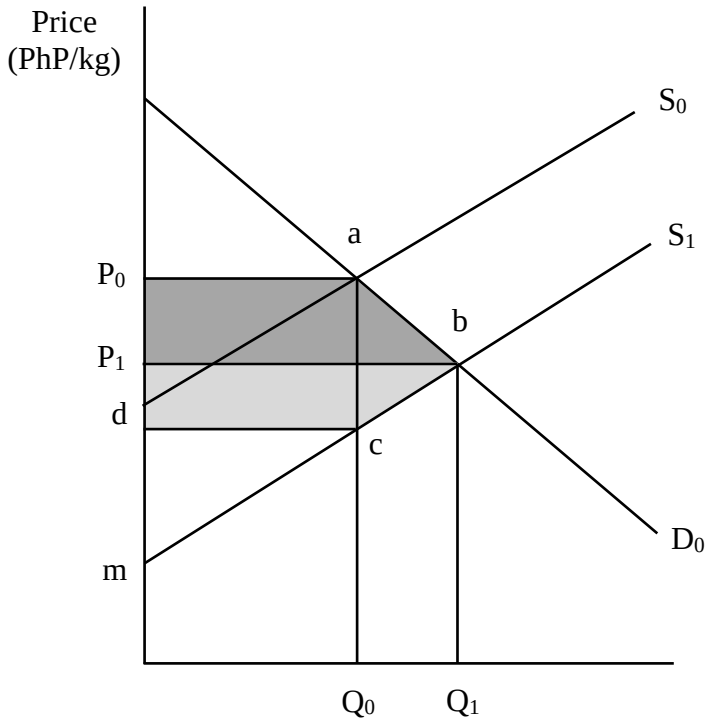


Figure 6. Welfare changes from artificial insemination technology

Changes in the equilibrium price and quantity of carabao meat bring about changes in the level of welfare accruing to producers and consumers and, therefore, a change in total economic welfare. In the above figure, total economic surplus is given by the area *dabm*. Producers benefit because they can produce the same amount of meat at a lower cost or more meat at the same cost. On the other hand, consumers gain from the reduction in the price and increased quantity of meat.

Following the learnings from Alston *et al.* (1995), the gains or surpluses to producers (ΔPS) and consumers (ΔCS) are represented by the areas P_1bcd and P_0abP_1, respectively and estimated as:

$$\Delta PS = (K-Z)P_0Q_0(1+0.5Z\eta) \quad (7)$$
$$\Delta CS = P_0Q_0Z(1+0.5Z\eta) \quad (8)$$

where:

$K = k/P_0$
$Z = K\varepsilon/ (\varepsilon+\eta)$
P_0 = initial price
Q_0 = initial quantity
ε = elasticity of supply at the farm level
η = absolute elasticity of demand at the farm level

The total welfare gain is the sum of the changes in producer and consumer surpluses.

This study used both primary and secondary data in determining the *k*-shift and economic surplus. Primary data were obtained through key informant interview and survey. These included the cost and useful life of native caracow, liveweight of a native and crossbred yearling, labor costs, veterinary supplies, bull/AI service fee, and cost and useful life of shed house. Meanwhile, secondary data included price elasticity of demand and supply of beef, volume of carabao production, and farm gate price of carabao for slaughter. The volume of production and farm price of carabao meat in Samar Island was obtained from the Philippine Statistics Authority (PSA). The volume of meat production was obtained as the sum of the average production in each province from 2011-2018. On the other hand, the farm price was estimated as the average price in Eastern Samar and Western Samar from 2011-2018. The farm price for Northern Samar was not available. The *k*-shift (supply shift) was estimated as the change in unit production costs as a proportion of the product price.

The benefits from artificial insemination that were measured as economic surplus from the model represented the gross returns to the UNAIP for a specified time period. A complete analysis of the flow of net benefits over time required the estimation of investment, adoption rate, and life span of the technology packages. Estimated welfare gains were computed for a 30-year period.

Adoption rate was estimated based on the actual cumulative calf drop across provinces per time period and not merely on the number of carabao raisers who subjected

their animals to AI. This was obtained by getting the ratio between cumulative calf drop and the total carabao inventory which produced more conservative estimates of adoption.

3.4.5 Benefit-Cost Analysis

Benefit-cost analysis (BCA) was done to determine the rate of return to UNAIP investments. The streams of investments/costs and benefits were measured over time. Real values of investments 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 benefits and costs were adjusted for the time value of money so that benefits and costs over time were expressed in their present values. The present values were obtained using 6% rate of interest over a 30-year period.

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.

3.4.6 Analysis of Most Significant Change Stories

Aside from the quantitative measures of A-PLP impacts, qualitative indicators were also determined through the stories of change narrated by farmer-beneficiaries of A-PLP. 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 A-PLP.

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 A-PLP. These questions included the following:

1. *Tell me how you (the storyteller) first became involved with the A-PLP. What is your involvement with the project? (PROBE: What technology/services – i.e. 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 A-PLP.*
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 thengrouped into domains or categories corresponding to the expected outcomes of the A-PLP. 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 A-PLP 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).

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 A-PLP; e*tc*.)
4	**Reactions to A-PLP-:** Changes in the clients' opinion about the A-PLP *(i.e*., the A-PLP services)
3	**Involvement**: How many farmers participated in the A-PLP 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*.)

3.4.7 Other Analytical Tools

This study employed binary logistic regression to determine the factors affecting the probability of adoption of SAIS RED technologies and the probability of success of the Artificial Insemination (AI) on carabaos. The logistic function provides the probability of occurrence of an event and not the estimate of the values of the dependent variables. It is calculated with the following equation:

$$p = \frac{1}{1+e^{-z}}$$

where:

p = probability
e = Euler's number (approx. 2.718)
z = defined with the following equation

$$z_k = \beta_0 + \sum_{j=1}^{J} \beta_j \cdot x_{j,k} + u_k$$

where:

k = the case
β = coefficients
j = number of independent variables
$x_{j,k}$ = characteristics of independent variable j for case k
u_k = error term

The z-values are also referred to as "logits" and the coefficients as "logit coefficients." The logit coefficients reflect the size of the influence of the independent variables.

T-test was also used to compare income of farmer-beneficiaries *before* and *after* A-PLP interventions.

CHAPTER IV
RESULTS AND DISCUSSION

4.1 The Agri-Pinoy Livestock Program (A-PLP)

The A-PLP was the banner Livestock Program implemented by the Department of Agriculture (DA) during the term of President Benigno Simeon C. Aquino III from 2010 to 2016. In general, it aimed to help ensure food security, alleviate poverty, enhance profitability and income as well as achieve global competitiveness for the livestock and poultry industry.

Its specific objectives were as follows:

(1) increase livestock production and improve livestock productivity to help ensure the availability, accessibility and affordability of livestock products;
(2) increase the income of livestock farmers by providing access to technology, resources, support services, and infrastructure;
(3) ensure the compatibility of practices in the livestock and poultry enterprises with environmental standards;
(4) work for the global competitiveness of the domestic poultry and livestock enterprises; and,
(5) provide a policy environment conducive to the continuing growth and development of the livestock and poultry industry.

The A-PLP had six components, as follows: (1) Disease Control and Eradication; (2) Genetic Resources Improvement; (3) Meat Safety and Quality; (4) Capability Development; (5) Research and Development; and (6) Public and Private Partnership. Moreover, these components were implemented through provision of the following services: (a) Production Support Services; (b) Marketing Development Services; (c) Extension Support, Education and Training Services; (d) Research and Development Services; (e) Regulatory Services; (f) Information Support Services; and (g) Policy Formulation, Planning and Advocacy Services.

4.1.1 Implementation of the Agri-Pinoy Livestock Program (A-PLP) in Eastern Visayas

Through the A-PLP, the DA-RFO8 aimed to increase livestock inventory by at least five percent (5%) and meat production by at least three percent (3%) for selected livestock species in Eastern Visayas from 2012 until 2016. Attainment of these aims was envisioned by achieving two (2) major final outputs (MFOs), namely: (1) MFO2 – Technical Support Services, and (2) MFO 5 – Provision of Agricultural Equipment and Facilities.

Different programs and activities were implemented in order to achieve each MFO (Table 4). MFO 2 was composed of seven support services as follows: (1) production support services, (2) market development services, (3) extension support, education and training, (4) research and development, (5) regulatory services, (6)

information support services, and (7) policy formulation, planning and advocacy services.

Table 4. Major Final Outputs (MFOs) addressed by A-PLP and the component programs/ activities

Major Final Output and Component Programs/Activities
MFO2. Technical Support Services
1. Production support services
a. Genetic Improvement Program
i. Male Breeder Loan Program (MBLP)
ii. Unified Artificial Insemination Program (UNAIP)
iii. Production Farm Development Program
b. Animal Health Program
i. Prevention, control and eradication of economically important animal diseases
ii. Distribution of vaccines/biologics
iii. Provision of veterinary drugs and medicine for emergency response
iv. Provision of disease diagnostic laboratory services
v. Provision of feed analytical services
c. Pasture Development Program
i. Provision of improved forage seeds
ii. Provision of improved forage vegetative planting materials
2. Market Development Services
a. National Marketing Assistance Program
3. Extension Support, Education and Training Services
a. Upgrading of livestock techno-demo farm
b. Capacity Building for Agricultural Extension Workers (AEWs)
c. Distribution of Information, Education and Communication (IEC) Materials
d. Salary Supplementation for AEWs
4. Research and Development
a. Samar Island Small Ruminant Enterprise Development (SAIS RED)
5. Regulatory Services
a. Enforcement of Regulatory Services
6. Information Support Services
a. PhilAHIS
b. UNAIP e-Reporting
7. Policy Formulation, Planning and Advocacy Services
a. Response to emergency situations
b. Consultation activities
MFO5. Provision of Agricultural Equipment and Facilities
a. Animal Infusion and Restocking Multiplier Facilities
b. Provision of Farm Machineries and Equipment

The Production Support Services involved three major components: genetic improvement program, animal health program, and pasture development. The Genetic Improvement Program (GIP) aimed to improve the production and reproduction

potentials of the local herd through the introduction of superior quality genetics. This involved the establishment and maintenance of livestock (sheep, cattle, goat, and carabao) nucleus, multiplier and production farms/centers which were mandated to produce genetically-superior or improved animals for distribution. GIP mainly involved two schemes: (a) Male Breeder Loan Program (MBLP) and (b) Unified National Artifical Insemination Program (UNAIP). In addition, it involved Animal Infusion and Restocking Program (AIRP). Meanwhile, the Animal Health Program aimed to prevent, control and eradicate economically important animal diseases. This was done through strategic vaccination, active animal disease surveillance, quarantine, and other related activities. These activities were complemented by strengthening disease diagnostic and feed analysis capabilities. Towards this end, the A-PLP supported the Regional Animal Disease Diagnostic Laboratory (RADDL) and Regional Feed Analysis Laboratory (RFAL). The major intervention for the Animal Health Program focused on the provision of veterinary drugs and biologics in coordination with the Local Government Units (LGUs) and technical support as well as disease diagnostic and feed services. On the other hand, Pasture Development aimed to develop and improve the existing grazing areas dominated by native vegetation by introducing improved forage seeds, cuttings and/or rootstocks.

The A-PLP recognized the importance of market to ensure the profitability and sustainability of livestock and poultry operations. With this, the Market Development Services provided interventions in terms of agribusiness fora and provision of weighing scale that can be used in Livestock Auction Markets. The latter hoped to correct the practice of pricing livestock based on ocular estimation hence, preventing farmers from being shortcharged in the sale of their animals.

Another technical support is the provision of Extension Support, Education and Training Services (ESETS). This component aimed to facilitate promotion and adoption of livestock production and management technologies. It provided interventions in the form of upgrading of livestock techno-demo farm, capacity building of Agricultural Extension Workers (AEWs) and farmers, distribution of Information, Education and Communication (IEC) materials, and salary supplementation for AEWs.

Research and Development (R&D) is another technical support provided by the A-PLP in the search for new information to respond to current and emerging issues related to livestock production, processing and marketing as well as policy and program assessment and formulation. Meanwhile, the Regulatory Services involved the registration, licensing, accreditation as well as monitoring of groups and individuals engaged in the manufacture, distribution and sale of feeds and veterinary supplies. This component hoped to complement the policy of the Agriculture and Fisheries Modernization Act (AFMA) on the formulation and enforcement of product standards in order to ensure product quality and acceptability as well as consumer safety. The above-mentioned regulatory functions were transferred to the newly created Regulatory Division upon the implementation of the DA-Rationalized Structure hence were not funded by the A-PLP starting 2014. Similarly, the Information Support Services (ISS) and Policy Formulation, Planning and Advocacy Services (PFPAS) were dropped from among the MFO 2 components of A-PLP effective 2014. However, the Phil-AHIS and UNAIP e-reporting components of ISS were transferred to ESETS and PSS, respectively.

Among the different programs, genetic improvement required commitment and counterpart resources from farmers, partner agencies and LGUs. As such, the DA-RFO8 established and advocated requirements and procedures for availment of genetic improvement services (Table 5).

Table 5. Description, requirements and implementation procedures of the A-PLP programs/ activities

The A-PLP Genetic Improvement Program
Aim: To improve the productive and reproductive potentials of the local herd through the introduction of superior quality genetics.
1. Male Breeder Loan Program (MBLP). This was a distribution scheme where superior quality bulls, carabulls, bucks and rams were loaned out to farmers to be used for genetic improvement. The requirements for farmers who wish to avail of the program were as follows: i. Have at least 10 heads of breedable females ii. Willing to ensure the breeder animal with the Philippine Crop Insurance Corporation (PCIC) The procedure for availment consisted of: i. Letter of Intent to the Regional Executive Director (RED) ii. Site validation and recommendation iii. Reservation at station and preparation of release documents iv. Letter of Approval/Disapproval to Requesting Party v. Withdrawal of animal by Requesting Party if the request was approved
2. Unified Artificial Insemination Program (UNAIP). This program aimed to integrate all efforts to upgrade cattle, carabao and small ruminants for chevon, beef and dairy under one program. UNAIP utilized artificial insemination (AI) of superior quality semen as a strategy to improve the genetic potential of cattle, carabao and goats. A key factor to implementation of the program was the involvement of the LGU. Other agencies like the National Dairy Authority (NDA) and Philippine Carabao Center (PCC) were also involved. To enable program implementation, the LGU and DA or its allied agencies (NDA/ PCC) had to provide the following requirements: a) LGU: i. Assign a technician or private individual to focus on AI ii. Allocate at least PhP50,000/year for operating expenses/supplies iii. Procure liquid Nitrogen mother tank (1) and field tank (1) iv. Must designate a coverage area with at least 500 breedable female animals.
The A-PLP Genetic Improvement Program b) DA/ PCC/ NDA i. Train technicians or private individual designated by LGU ii. Provide calf-drop incentive to qualified technicians iii. Provide supply of liquid Nitrogen and frozen semen iv. Provide technical assistance and mentoring for AI technicians

The procedure in provision of AI services involved the following steps among interested LGUS:

i. Inform Provincial AI Coordinator (PAIC)
ii. Prepare the requirements
iii. Send personnel for AI training
iv. Trained technician returns and provides AI services

3. Production Farm Development. This program was designed to assist interested LGUs and private individuals in the establishment of sustainable livestock production farms and centers that will serve as source of superior genetic materials in support of the animal dispersal programs.

The requirements for the program were:

a) LGU: land area, housing, caretaker, pasture, fencing, water supply
b) DA: initial breeder stocks, training, planting materials, technical assistance

4.2 A-PLP Inputs in Samar Island

The DA-RFO8 invested about PhP116 million (nominal value) in implementing the various A-PLP strategies for Samar Island from 2011–2016 (Table 6). This is equivalent to a little over PhP127 million real value (using 2018 as the base year) and PhP160 million present value. Such investments were made to attain two major final outputs: (1) Technical Support Services and (2) Provision of Agricultural Equipment and Facilities. Approximately 92% of the investment was incurred in providing the following technical support services: (a) production support, (b) market development, (c) extension support, education and training, (d) research and development, (e) regulatory, (f) information support, and (g) policy formulation, planning and advocacy.

Half of the total investment was spent on production support services. These included expenses on the operation of two Livestock Satellite Stations, establishment of two municipal multiplier farms and one municipal breeding center, UNAIP, MBLP, Pasture Development Program, and veterinary drugs and biologics distribution, among others. The DA-RFO8 also transferred funds amounting to PhP17.7 million (ranging from PhP250,000 to PhP2,725,000) to support the AIRP as well as expansion of the LGU-led Animal Dispersal Program that involved carabao, cattle, goat, swine, and chicken, especially after the occurrence of Super Typhoon Yolanda. Meanwhile, a little less than a quarter of the A-PLP investment (23%) was incurred on extension support, education and training services. These involved capacity building and salary supplementation of AEWs as well as distribution of IEC materials.

Table 6. Investments (in PhP) of the Agri-Pinoy Livestock Program (A-PLP) in Samar Island, 2011 – 2016

Major Final Output/ Strategy	Nominal Value	Real Value	Present Value (2018)
MFO 2. Technical Support Services			
Production Support Services	58,004,574.00	63,899,628.61	80,470,634.52
Animal Infusion and Restocking Program*	16,200,000.00	17,593,375.99	21,933,418.98
Market Development Services	1,125,000.00	1,226,807.66	1,461,147.55
Extension Support, Education and Training Services	26,963,905.00	29,971,185.68	39,329,285.95
Research and Development	3,973,735.00	4,329,577.92	5,328,187.92
Regulatory Services	139,000.00	158,600.24	225,429.26
Information Support Services	87,000.00	99,157.50	140,548.46
Policy Formulation, Planning and Advocacy Services	335,000.00	379,719.74	529,869.10
MFO 5. Provision of Agricultural Equipment and Facilities			
Animal Infusion and Restocking the Multiplier Facilities	8,282,000.00	8,852,286.03	9,946,428.58
Provision of Farm Machineries and Equipment	766,000.00	818,745.60	919,942.56
Total	115,896,214.00	127,329,084.98	160,284,892.88

4.3 A-PLP Outputs in Samar Island

Being part of the continuing Livestock Program of DA-RFO8, the programs and services have been existent before A-PLP, and are still on-going to date. Since the impact evaluation covers the period of A-PLP, the activities/strategies and outputs indicated in this report are those that have been implemented and achieved from 2011 to June 2016 (Table 7).

4.3.1 Technical Support Services

4.3.1.1 Production Support Services

Several strategies were implemented under the A-PLP to provide support services for the production of livestock and poultry in the region. These included operation of Livestock Satellite Stations, genetic improvement program, animal infusion and restocking program, establishment of municipal multiplier farms and breeding centers as well as pasture development and animal health programs.

Operation of Livestock Satellite Stations. Two Livestock Satellite Stations in Samar Island were maintained during the period of A-PLP, namely: (1) SMES-Salcedo Satellite Station located in Brgy. Naparaan, Salcedo, Eastern Samar and (2) SJES-Gandara Satellite Station situated in Brgy. San Agustin, Gandara, Samar.

Table 7. Outputs of the Agri-Pinoy Livestock Program in Samar Island, 2011–2016

MFO/ Strategy/ Performance Indicator	Province			Total
	W. Samar	E. Samar	N. Samar	
MFO 2. Technical Support Services				
A. Production Support Services				
Operation of Livestock Production Center				
No. of production center maintained	1	1		2
No. of breeder animals maintained	12	150		162
Unified Artificial Insemination Program				
No. of semen straws distributed	5,099	2,169	5,282	12,550
No. of animals inseminated				
Carabao	2,463	1,161	2,121	5,745
Cattle	109	182	137	428
Male Breeder Loan Program				
No. of breeder animals loaned				
Carabull	7	9	1	17
Bull	2	2	1	5
Ram	5	4	5	14
Buck	2	3	14	19
Animal Infusion and Restocking Program				
No. of animal distributed (head)				
Carabao	6	65	113	184
Cattle			78	78
Goat	236	183	306	725
Sheep		8		8
Swine	176	240		416
Chicken	1,049	300		1,349
Duck	400			400
Turkey			19	19
Establishment of Municipal Multiplier Farm (MF)				
No. of Goat MF established/constructed	2			2
No. of upgraded goats procured (head)	66			66
Establishment of Municipal Breeding Center (MBC)				
No. of MBC established	1			1
No. of pasture area established and maintained (ha)	0.5			0.5
No. of upgraded breeder goats procured	12			12
No. of upgraded breeder cattle procured	7			7
Pasture Development Program				
Qty. of forage seeds distributed (kg)	7	6	5	18
No. of rootstock/cuttings distributed	126,000	111,000	115,000	352,000
FMD & AI Free Maintenance Program				
No. of municipalities covered for surveillance per year	32	31	24	87

MFO/Strategy/Performance Indicator	Province			Total
	W. Samar	E. Samar	N. Samar	
Veterinary Drugs and Biologics Distribution				
Dose of drugs and biologics distributed	379,278	192,736	288,676	860,690
Qty. of vaccine carrier	36	28	29	93
No. of Animal Health Kit distributed	31	25	27	83
Regional Animal Disease Diagnostic Laboratory				
No. of services rendered	110	129	160	399
B. Market Development Services				
National Marketing Assistance Program				
No. of market assessment conducted		1		1
No. of market survey conducted		1		1
No. of market matching conducted		1		1
No. of livestock auction markets upgraded	1	2		3
No. of Agribusiness investment forum	4	5	4	13
No. of seminar on livestock production/slaughter house operation	1	2		3
No. of digital weighing scale provided	1	2		3
C. Extension Support, Education and Training Services				
Upgrading of Livestock Techno-Demo Farm				
No. of techno-demo farms supported	1	1	1	3
Capacity Building of Agricultural Extension Workers (AEWs)				
No. of AEWs trained per year	61	43	52	156
Distribution of IEC Material				
No. of IEC material distributed per year	601	496	493	1,590
Salary Supplementation of AEWs				
No. of AEWs provided with incentive per year	63	43	54	160
D. Regulatory Services				
Enforcement of Regulatory Services				
No. of registration services provided (2011-2013 only)	159	72	112	343
E. Information Support Services				
No. of Phil-AHIS maintained	1	1	1	1
No. of UNAIP e-Reporting System maintained	1	1	1	1
F. Policy Formulation, Planning and Advocacy Services				
No. of emergency situations responded	10	2	8	20
No. of consultation activity conducted	6	5	12	23

MFO/Strategy/Performance Indicator	Province			Total
	W. Samar	E. Samar	N. Samar	
MFO.5 Provision of Agricultural Equipment and Facilities				
Animal Infusion and Restocking Multiplier Facilities				
No. of animals infused/restocked (head)				
Carabao	93	51	19	163
Cattle	15	20	33	68
Goat	52	63	66	181
Native Chicken	350	180	540	1,070
Sheep	23	70	25	118
Swine	15	10	20	45
Duck	150	75		225
Provision of farm machineries and equipment				
Equipment provided				
Drenching gun	27	24	26	77
Pig catcher	31	25	27	83
Dog muzzle	31	25	27	83
Eartag applicator	1	1	1	3
Eartags	200	200	200	600
Egg Incubator	8	3	10	21

The Salcedo Satellite Station was primarily responsible for the production of turkey breeders. It maintained 150 breeder animals from 2011–2016. At the time of assessment, the Station raised two breeds of turkey: *Broad Breasted Bronze* and *Broad Breasted White*.

Meanwhile, the Gandara Satellite Station was responsible for breeding and production of the dairy type Bulgarian Murrah buffalo breeders. On average, it maintained 12 breeder animals between 2011 to 2016. This enabled the station to contribute to the carabao Male Breeder Loan Program of DA-RFO8.

Genetic Improvement Program. The genetic improvement program aimed to improve production and reproduction potential of local animals. This was done by the introduction of superior quality genetic materials through the Unified National Artificial Insemination Program (UNAIP) and Male Breeder Loan Program (MBLP).

UNAIP was actively pursuing Artificial Insemination (AI) using semen from exotic breeds as a strategy to improve/upgrade the genetic make-up of local animals. The program distributed 12,550 semen straws across Samar Island during the A-PLP (2011 to 2016). Within the same period, a total of 6,173 animals were inseminated, 93% of which were carabaos.

The Male Breeder Loan Program (MBLP) was a distribution scheme that involved loaning out of superior quality male breeder animals to farmers. The breeder animals loaned out to beneficiaries included bull (cattle), carabull, ram, and buck. The most common breeder provided across Samar Island was buck, followed by carabull (Table 7).

Animal Infusion and Animal Restocking Program. This program was implemented by the A-PLP to increase livestock inventory in Samar Island. Two schemes were involved: (1) regular program and (2) fund transfer to LGUs. The first scheme usually consisted of direct distribution of animals by DA-RFO8 to the recipients. Meanwhile, the second scheme involved fund transfer from DA-RFO8 to concerned LGUs. The latter procured the animals which they later distributed to identified beneficiaries.

The livestock species infused in Samar Island under the first scheme included carabao, cattle, goat, sheep, swine, native chicken, duck and turkey. The most common animal species infused was native chicken (1,349 heads). It was followed by goat (725 heads) and swine (416 heads). The Province of Samar received more than half (59%) of the animals infused across the three provinces. Moreover, the Province was also a recipient of two Goat Multiplier Farm and a Municipal Breeding Center for goat and cattle (Table 7).

Meanwhile, the animal infusion and restocking program under the second scheme occurred after the devastation of Super Typhoon Yolanda. A total of 22 LGUs across provinces have benefitted, 50% of which were located in Eastern Samar (Figures 7 and 8). However, due to peace and order conditions, two out of 22 MLGUs were not visited during the evaluation.

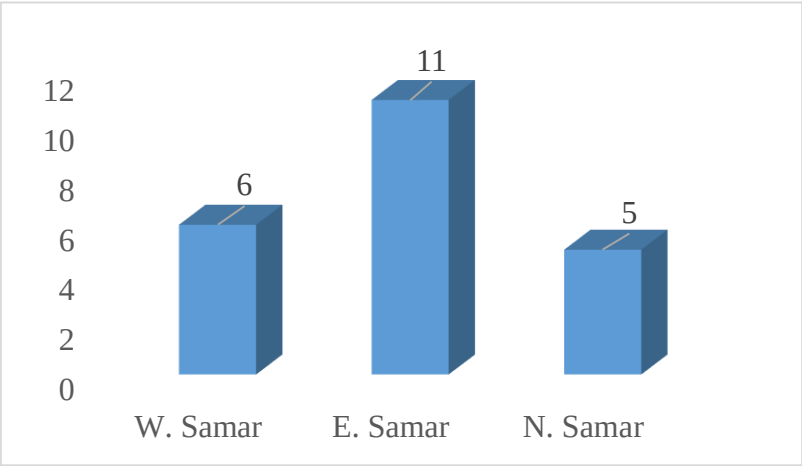


Figure 7. Number of LGUs which benefitted from animal infusion funds after Typhoon Yolanda in Samar Island

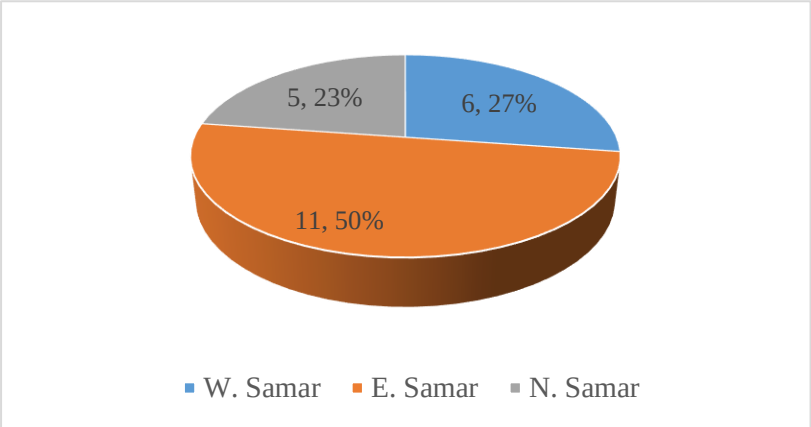


Figure 8. Distribution of local government units that availed of animal infusion funds after Typhoon Yolanda

Aside from procurement of animals, part of the funds transferred to the LGUs supported the establishment of a multiplier farm. This was in LGU Basey, Western Samar which received PhP1.3 million. More than 50% of the funds (PhP700,000.00) was used in the construction of the building for goat and cattle.

The multiplier farm established in Basey, Samar

Pasture Development. Another important A-PLP strategy to improve livestock production in Samar Island was pasture development. Improved pasture and forage materials were introduced in the project sites and distributed to clients across provinces. Among the three provinces, more forage seeds and rootstock/cuttings of pasture materials were distributed in the Province of Samar.

Animal Health Program. A-PLP's animal health program targeted the eradication and control of animal diseases. This was done through provision of drugs and biologics, animal disease surveillance and disease diagnosis. A total of 860,690 doses of drugs and biologics and 83 Animal Health Kits were distributed across three provinces within the

six-year period; 44% and 37%, respectively were provided to clients from the Province of Samar. Moreover, DA-RFO8 collaborated with the LGUs in the surveillance of foot-and-mouth disease (FMD) and avian influenza (AI) to assure maintenance of the FMD-free and AI-free status of the island. In addition, 399 animal disease diagnostic services were rendered by the Regional Animal Disease Diagnostic Laboratory. Most of these services (40%) were done on samples from Northern Samar.

4.3.1.2 Market Development Services

Another strategy employed in the implementation of A-PLP was the provision of Marketing Development Services through the National Marketing Assistance Program of the Agribusiness Marketing and Assistance Division (AMAD). The program provided the following activities in Samar Island: market assessment, survey and matching; upgrading of livestock auction markets; agribusiness investment forum; seminar on livestock production/slaughter house operation; and provision of digital weighing scale. It was observed that more interventions were implemented in the Province of Eastern Samar compared to Samar and Northern Samar.

On the other hand, market assessment, matching and survey activities were only done in Eastern Samar while the seminar on Livestock Production and Slaughterhouse Operation, upgrading of livestock auction markets as well as provision of digital weighing scale were provided in Samar and Eastern Samar. Three auction markets were upgraded during the A-PLP, two of which were located in Eastern Samar. Similarly, two out of three digital weighing scales were provided to Eastern Samar. Meanwhile, Agribusiness Fora were conducted in all three provinces.

4.3.1.3 Extension Support, Education and Training Services

Extension Support, Education and Training Services targeted the promotion of livestock technologies. It engaged in the establishment/upgrading of Livestock Techno-Demo Farms that showcased different livestock and poultry technologies, capability building of Agricultural Extension Workers (AEWs) on livestock and poultry production and management as well as production and distribution of IEC materials. Moreover, it also provided incentives to AEWs involved in the program.

Within the six-year period, the A-PLP has supported the upgrading of one Livestock Techno-Demo Farm in each of the three provinces. It also provided support in building the capability of 156 AEWs, distribution of almost 1,600 IEC materials, and provision of incentives to 160 AEWs across Samar Island. More AEWs in Samar have been trained and provided with incentives compared to Eastern Samar and Northern Samar. Similarly, more IEC materials were distributed in Samar (Table 7).

4.3.1.4 Research and Development Services

Several R&D projects were implemented in Eastern Visayas during the A-PLP. The most relevant in the project sites was the Samar Island Small Ruminant Enterprise Development (SAIS RED) Project. This was implemented from July 2013 to June 2017

by DA-RFO8. The cooperating agencies included the PLGUs and selected municipal and city LGUs in Samar, Eastern Samar and Northern Samar.

The project took off from the gains of the RED Project implemented in Leyte Province in 2010. It covered 21 LGUs and engaged 284 farmer-partners across Samar Island. These farmer-partners included existing goat raisers, retirees, overseas Filipino workers (OFWs) and other interested livestock raisers.

The project implementers conducted several capability-building activities which include: (a) Orientation on SAIS RED and Participatory Planning, (b) Training Course on Forage Pasture Development and Dairy Production, (c) Technological Training on Goat Check Production System-cum-Enterprise Development, (d) Training on Urea-Molasses Mineral Block (UMMB) Processing/Production, (e) Artificial Insemination Training on Goats *cum* Chevon and Milk Processing, as well as (f) Educational Tour/*Lakbay-Aral* to Progressive Goat Farms in Luzon and Mindanao.

SAIS RED also introduced a basket of technology options to farmer-partners. These included housing, stall feeding, use of improved forage/pasture, UMMB/ Salt/ concentrate supplementation, strategic deworming, and upgrading.

The project also facilitated the formation of farmer-partners into goat raisers' organizations which resulted to 11 associations across Samar Island: five each in Eastern Samar and Northern Samar and one in Samar. These organizations federated into Samar Island Rural Enterprise Goat Association Integrated Network (SAIS REGAIN), and later registered with the Department of Labor and Employment (DOLE).

The farmer-partners, through their respective organizations, were also trained on the operation and management of goat-based enterprises. Six allied goat-based enterprises were introduced by the project, namely: (1) Legume Plant Material Nursery Enterprise, (2) Slaughter Goat Production Enterprise, (3) Buck for Hire Enterprise, (4) Goat Breeder Production Enterprise, (5) Meat Products Enterprise, and (6) Dairy Production Enterprise. During project implementation, two out of six enterprises emerged: (1) Legume Plant Material Nursery Enterprise and (2) Slaughter Goat Production Enterprise. In addition, one farmer-partner has engaged in a combination of Slaughter/Goat Breeder/Dairy Production Enterprise.

4.3.1.5 Regulatory Services

Regulatory services involved registration, licensing and accreditation as well as monitoring of groups and individuals engaged in the manufacture, distribution and sale of drugs, feeds, livestock and poultry products. Moreover, regulatory laws were enforced in order to ensure product quality, consumer safety and acceptability of products.

Similar to other parts of the Region, regulatory services under the A-PLP were enforced in Samar Island only until 2013. From 2011 to 2013, a total of 343 registration services were provided, 46% of which were done on establishments in Samar Province.

4.3.1.6 Information Support Services

Information Support Services rendered during the A-PLP involved the installation and maintenance of Livestock Information Systems (LIS). There were two types of LIS in Eastern Visayas: (1) Philippine Animal Health Information System (Phil-AHIS) and (2) UNAIP e-Reporting System. The Phil-AHIS was an integrated system aimed at enhancing animal health and management capability by providing standard, timely and improved quality of information. It helped assess the geographical distribution and monitoring of disease occurrences. On the other hand, UNAIP e-Reporting was a simplified system aimed at monitoring the artificial insemination (AI) service provision in the region.

All provinces in Samar Island satisfactorily maintained both the Phil-AHIS and UNAIP e-reporting system. However, the services were no longer under the A-PLP starting 2014.

4.3.1.7 Policy Formulation, Planning and Advocacy Services

Another strategy employed by the National Livestock Program under Technical Support Services was Policy Formulation, Planning and Advocacy Services. In Samar Island, the specific activities of the A-PLP included Quick Response to Emergencies and consultation with stakeholders.

During the A-PLP implementation until 2013, twenty (20) emergency situations across provinces were responded to by DA-RFO8. Half of these emergencies occurred in Samar; 40% occurred in Northern Samar while the rest occurred in Eastern Samar.

4.3.2 Provision of Agricultural Equipment and Facilities

4.3.2.1 Animal Infusion and Restocking Multiplier Facilities

The A-PLP supported the animal multiplier facilities established in various LGUs across Samar Island by infusing and restocking these with animals. The species of animals infused into the multiplier farms were somewhat similar to those infused directly to individual beneficiaries. These included carabao, cattle, goat, native chicken, sheep, swine, and duck.

Over the six–year period, the highest number of animals infused into the multiplier facilities were native chickens (1,070 heads), followed by carabaos (163 heads) and goats (181 heads). In terms of number, multiplier facilities in Samar and Northern Samar shared almost equally a total of 75% of the infused animals. The rest were infused to Eastern Samar.

4.3.2.2 Provision of Farm Equipment

Aside from animal infusion and restocking into multiplier facilities, the A-PLP also provided some LGUs with equipment needed in the implementation of some aspects

of the program. The equipment included drenching gun, pig catcher, dog muzzle, ear tag applicator, and ear tags. All provinces received the same number of the above-mentioned equipment.

In support to poultry development activities, egg incubators were likewise distributed. Around half of the 21 incubators were distributed to Northern Samar which received about half of the infused native chickens. About 40% of the incubators were distributed to Samar Province where the largest number of ducks and the second largest number of chickens were infused.

4.4 A-PLP Outcomes in Samar Island

The outputs of A-PLP activities in Samar Island resulted to achievement of certain outcomes. These outcomes reflected the quality of the processes involved in the implementation and management of the different A-PLP components.

The beneficiaries of UNAIP, MBLP, SAIS RED and AIRP may have also availed of the other support services provided by A-PLP. These in turn could have contributed to the attainment of outcomes. Said outcomes produced by these programs were quantifiable and could be identified through surveys. As such, results of the survey on these programs were utilized to portray the outcomes. These outcomes were then related to the processes in implementing the specific programs and analyzed to portray whether implications on improving implementation could be drawn out.

An in-depth survey was done on randomly selected beneficiaries across provinces of the above-mentioned programs. To provide comparison, randomly selected non-beneficiaries of UNAIP and SAIS RED were also included in the survey. This section presents the characteristics and practices of the sample farmer-respondents based on the survey conducted in the project sites. Data from 252 respondents for the UNAIP (132 beneficiaries and 120 non-beneficiaries) and 117 sample farmers for the SAIS RED (58 beneficiaries and 59 non-beneficiaries) across the provinces were included in the analysis. This section also discusses the outcomes generated by the A-PLP.

4.4.1 Operation of Livestock Production Centers

The Operation of the livestock production center in SMES-Salcedo Satellite Station has enabled the production of turkey breeders that were distributed in the A-PLP animal infusion activities. On the other hand, SJES-Gandara Satellite Station enabled DA-RFO8 to provide Bulgarian Murrah Buffalo breeder bulls used in the Male Breeder Loan Program.

Moreover, SMES-Salcedo Satellite Station has maintained about 15 ha of pasture area which was used as source of forage planting materials for distribution to beneficiaries of the pasture development program. More than 90% of the pasture and forage area was devoted to *Brachiaria humidicola*, about two-thirds (64%) of which was established during the A-PLP. The other pasture and forage species available in the Station included *Indigofera* sp., *Desmodium cineria* (rensonii), *Flemingia macrophylla*, *Trichantera gigantea*, and three varieties of Napier Grass (King, Dwarf and Super).

Meanwhile, the staff of the Gandara Satellite Station were heavily involved in the promotion of artificial insemination (AI) on carabaos. The AI services provided by the Station produced 45 heads of caracalves in 2016 alone. The station likewise maintained a pasture area utilized for the production of forage planting materials that were distributed to beneficiaries of the pasture development program.

These outcomes highlighted the important role that livestock production centers play in livestock development endeavors. The centers served as accessible sources of forage planting materials as well as expertise on animal production (*e.g.* AI) that were very vital in supporting the other programs of A-PLP.

Allocation of resources to sustain the operation of livestock stations was therefore a noteworthy investment of the A-PLP. It is sad to note that only a few livestock stations existed in the provinces of Samar Island. These institutions could have been very useful in facilitating flow of resources and activities from DA-RFO8 to the LGU and farmer-clientele.

4.4.2 Outcomes of the Unified National Artificial Insemination Program

A total of 6,173 animals across provinces were inseminated through UNAIP during the A-PLP. A great majority of the inseminated animals (93%) were carabaos. Hence, carabaos were the focused species of the evaluation.

4.4.2.1 Characteristics and Practices of the Sample Carabao Raisers

Table 8 shows some selected socio-demographic and farming characteristics of the carabao raisers in Samar Island. The sample carabao raisers were in their mid-fifties. Those who availed of UNAIP's AI services (beneficiaries) had an average age of 54 years. They were younger by a year than nearby raisers who did not avail of the AI services (non-beneficiaries). Majority of the beneficiaries and non-beneficiaries were males and married. On average, they had five household members which is a little over the national average household size of 4.4 in 2015.

The beneficiaries and non-beneficiaries were inhabiting houses owned by their respective families. The average educational attainment among raisers was in the secondary level, with beneficiaries having almost a year lesser number of formal years at school than the non-beneficiaries.

A major difference among AI beneficiaries and non-beneficiaries was the annual household income. On average, the beneficiaries had annual household incomes that were about 50% higher than non-beneficiaries. This implied that households with more resources were able to avail of the AI services more than those with lower incomes. Apparently, household income indicates availability of resources that would enable (either directly or indirectly) adoption of AI services. Raisers with higher incomes apparently had more resources that enabled them to learn about the AI service opportunity or to avail of the service because they had more time that can be devoted to avail of the service (*e.g.* they had adequate time to submit their animals to AI, or to approach the AI technicians when their animals were in heat). Another indication of the

beneficiaries' higher resource-endowment was that they had slightly larger farm sizes than the non-beneficiaries.

Table 8. Socio-demographic and farming characteristics of UNAIP beneficiaries and non-beneficiaries in Samar Island

Variable	Beneficiaries (n=122)	Non-Beneficiaries (n=120)
Age (mean, years)	54	55
Gender (%)		
Male	90.9	84.2
Female	9.1	15.8
Civil Status (%)		
Single	4.5	3.3
Married	91.7	92.5
Widowed/ separated	3.8	3.3
Years in School	6.87	7.54
Household Size	5.0	5.0
Estimated Annual Income (PhP)	99,429.61	63,351.13
House Ownership (%)		
Owned	94.7	97.5
Rented	3.8	--
Others	1.5	2.5
No. of years in livestock raising	23	21
No. of years in carabao raising	17	15
Total Pasture Area (ha)	1.9	2.0
Total Farm Area (ha)	3.0	2.7
Land Ownership (%)		
Owner	50.8	47.5
Tenant	41.7	44.2
Leaseholder	4.5	5.8
Others	3.0	2.5
Distance of Farm (kms) to		
Nearest Road	1.6	1.4
Residence	2.2	1.5
Product Market	5.6	6.8
Input Market	5.7	7.4

The farms of the beneficiaries were also located closer to the market. Moreover, beneficiaries had slightly longer experience in livestock production (around 10% longer) than the non-beneficiaries.

In essence, the adoptors of UNAIP's AI services were slightly more endowed than the non-adoptors. These raisers were the ones who were more capable for early adoption of technologies and innovations. This implies that availability of AI services in the locality has to be made more constant so that those who are less-endowed will have increased chances of availing the technology.

4.4.2.2 Constraints and Potentials to Adoption of AI Services

The beneficiaries revealed several constraints to sustained adoption of AI services. During the A-PLP, availability of the AI technician and semen was a major constraint to sustained adoption that was identified by the beneficiaries themselves (Table 9). The other major perceived constraint (need for better skills in heat detection) could easily be addressed if an AI technician was constantly present in the locality.

Table 9. Constraints perceived by the beneficiaries in sustaining adoption of Artificial Insemination in Samar Island

Constraint	% of Raisers
Heat detection	48.7
Availability of AI Technician/ semen	43.6
High service charge	1.7
Low pregnancy rate	2.6
Others	3.4

These findings imply that an important direction for sustaining AI adoption in Samar Island is to make AI technicians and semen constantly available. The Village-Based AI Technician (VBAIT) scheme of the PCC has a very high potential to address this concern. VBAITs are local residents capacitated to provide AI services in their barangays through training and provision of AI supplies. The availability and easy access of AI technician in the locality (especially at the village-level) would address the problem of heat detection as well as timely availability of AI service.

PCC has made technical training available for interested entities. However, support was needed from the LGU, Provincial Agriculture/Veterinary Office and DA-RFO8 in terms of enabling attendance to training (transportation, food and accommodation) and sustaining AI service provision (LN2 supplies and transportation).

The need to sustain adoption and availability of AI services in Samar Island was also evident in terms of proportion of the animal population reached by the program. As reported in the outputs (Table 7), the number of female carabaos inseminated (5,745 heads) in the six-year duration of A-PLP (or an average of 958 heads/year) represented only 2.7% of the total number of breedable female carabaos in Samar Island (Table 10). Such figure implies the existence of a large number of animals that can still be reached out through AI. Moreover, this finding highlights the need for additional effort to reach out to more breedable female animals that can be bred through AI.

A major reason for the relatively low percentage of animals that were inseminated was the relatively low proportion of LGUs that had incorporated AI into their agricultural services program, i.e. devoting resources to develop their own functional AI technicians (Table 11). These included facilitating training of their technicians (LGU-based or village-based), provision of AI equipment (Nitrogen tanks) and support for AI activities by the technicians (transport and others).

Table 10. Carabao population in Samar Island (2011-2016)

Year	Eastern Samar	Northern Samar	Western Samar	Total
2011	32,501	45,836	42,297	120,634
2012	28,206	44,469	39,922	112,597
2013	23,789	45,957	36,980	106,726
2014	19,060	45,987	33,391	98,438
2015	19,218	45,400	32,647	97,265
2016	19,503	42,437	31,211	93,151
Annual Average	23,713	45,014	36,075	104,802
Breedable Female (estimated at 33% of population)	7,825	14,855	11,905	35,585

Out of the 73 LGUs in Samar Island, the highest number of LGUs that incorporated AI into their agricultural services was 17 (in 2013). The number varied between years, indicating that support to AI was not sustained by some LGUs.

Table 11. AI services rendered in the provinces of Samar Island, 2011-2016

Year	No. of LGUs Covered				No. of LGUs that Provided Counterpart			
	E. Samar	N. Samar	W. Samar	Total	E. Samar	N. Samar	W. Samar	Total
2010	2	-	5	7	-	-	-	-
2011	2	5	6	13	-	1	3	4
2012	11	8	7	26	1	8	2	11
2013	10	8	8	26	6	7	4	17
2014	2	11	10	23	2	7	4	13
2015	2	6	11	19	-	4	3	7
2016	2	9	12	23	1	4	4	9

The DA-RFO8 livestock station staff, provincial agriculture/veterinary offices (PAOs/PVOs) and PCC AI technicians were able to help increase the LGUs provided with the AI services. However, the joint effort of these agencies and the committing LGUs covered only a little over one-third (36%) of the LGUs in Samar Island.

The relatively low proportion of breedable animals reached by AI in Samar Island implies the need for activities that would enable more LGUs to participate in the UNAIP. The DA-RFO8, PAOs/PVOs and PCC have significantly contributed to an increase in coverage of AI services.

The low participation rate of LGUs in UNAIP indicates the need for more activities that would increase the number of LGUs participating in the program. The DA-RFO8, PAOs/PVOs, PCC, NDA and other UNAIP-member agencies need to plan out

strategies and devote resources towards this end. Such could include advocacy, representations and other strategies that would enable LGUs to allocate resources and participate in the provision of AI services in their localities.

The survey conducted revealed that the participating LGUs and raisers were significantly contributing to the success of the AI activities. Of the 131 AI beneficiaries involved in the survey, 3 in every 4 were facilitated by LGU Agriculture Office (Table 12).

Table 12. Agency that facilitated the AI service in Samar Island

Agency	Percent of AI Service Facilitated (n=131)
LGU Agriculture Office	74.0
Philippine Carabao Center	14.5
DA-RFO8	5.2
Total	100.0

Such data indicate the importance of getting the commitment of concerned LGU to participate in the UNAIP. On their own, the LGUs that have committed to participate in the UNAIP were able to contribute significantly in facilitating AI service provision. Among the AI beneficiaries surveyed, majority of the services were provided by the LGU AI technician (Table 13).

Table 13. Type of technician providing the AI service in Samar Island

Type of AI Technician	% of AI Service Provided (n=131)
LGU AI Technician	82.2
Provincial AI Technician	10.8
PCC AI Technician	7.0
Total	100.0

Moreover, animal raisers had a positive attitude towards AI since a considerable proportion (42%) of the raisers surveyed were the once who initiated availment of the AI service (Table 14). This indicates that committing to participate in the UNAIP would have high success potential for the participating LGU.

Table 14. Entities that that initiated availment of the AI service in Samar Island

Agency	% of AI Service Facilitated (n=131)
Raiser approached LGU Agriculture Office	41.5
LGU Agriculture Office identified and convinced raiser	57.0
Philippine Carabao Center	1.5
Total	100.0

The advocacy efforts for AI was relatively adequate in terms of getting the message of benefits from AI across to the beneficiaries. This was shown in the reasons for adopting AI services expressed by the UNAIP beneficiaries in the survey (Table 15). This result implies that the advocacy efforts employed during A-PLP could be expanded with very little need for improvement in terms of message. What is needed is a strategy to enable the message to reach out to more raisers.

Table 15. Reasons for availing of AI services in Samar Island

Reason	% of AI Beneficiaries (n=131)
Upgrading of stocks / offspring	81.7
Curiosity	6.9
Other reasons	11.4
Total	

Most of the expenses incurred by the PAO/PVO, DA-RFO8 and PCC were for the transport and storage of semen for AI. Foremost of these were for the liquid nitrogen (LN2) and the LN_2 tanks. The LN_2 had to be replenished every month for mother tanks (stationary semen storage) and every week for field tanks (smaller container used for transporting semen in the field). As these expenses were constant regardless of the number of services, the involvement of more LGUs or AI technicians in providing AI services for a province, LGU or region would increase cost efficiency. As such more AI services provided would mean lesser cost per AI service for an agency that has committed to participate in the UNAIP.

Efforts to involve more LGUs and entities to UNAIP would provide benefits not only to the new participants, but to all other participants as well. For instance, if there are more adjacent LGUs participating in the AI activities, each LGU might not need to purchase and maintain a LN_2 mother tank, as adequate semen can just be stored in just one common location. Hence, it would be beneficial for the DA-RFO8, PAOs/PVOs, PCC, and NDA to come up with strategies to get more LGUs and other entities (*e.g.* cooperatives, farmer groups, *etc.*) involved in the UNAIP. Additional effort towards this end will most likely provide benefits in terms of savings on expenses for AI service provision in the field.

Another concern implied by the outputs of the UNAIP was the relatively low success rate of the AI services (Table 16). The actual number of successful inseminations (resulting to calves produced) during the A-PLP was only about 7% (roughly one out of 10) of the total number of animals inseminated (381 out of 5,754). Such result highlights the need for improving implementation of AI to assure higher success rate.

In terms of procedure, the survey conducted by the project revealed that some good practices have not been put in place during the A-PLP (Table 17). Foremost of this was the failure of AI technicians to communicate with raisers on the importance of repeat insemination. The AI technicians failed to instruct raisers to observe for return heat of inseminated animals within the next 18-24 days after insemination. Such occurrence would have been easier to observe for, as it banked on the estrus cycle which is often consistent in farm animals and would involve an observation period of only a week. The

AI technicians likewise failed to arrange with the raisers for repeat insemination of their animals once these were found to be non-pregnant.

Table 16. Number of caracalves produced from AI by provine in Samar Island

Year	Eastern Samar	Northern Samar	Western Samar	Total
2011	1		36	37
2012		20	27	47
2013		45	34	79
2014	1	5	45	51
2015		14	44	58
2016			49	49
2017	6		54	60
Grand Total	8	84	289	381

Table 17. Adoption of good AI practices during the A-PLP in Samar Island

Good Practice*	% of Beneficiaries
1. Immediately after insemination, AI technician instructs raiser not to expose the animal to stress	94.0
2. At 2-3 months after AI, technician visited animal to check for pregnancy (pregnancy diagnosis)	73.3
3. If animal was pregnant, technician instructs raiser not to expose the animal to stress	98.0
4. If the animal was not pregnant, technician makes arrangement for repeat AI	26.5
5. AI technician conducted another visit during pregnancy to check on animal and advise raiser on what to prepare	6.1
6. Raiser informed AI technician during calving	2.3

* Multiple response

In summary, the number of animals and beneficiaries provided with AI services by UNAIP during the A-PLP was considerable but had high potential for improvement in terms of reach and success rate. Foremost among the needed improvement was increasing involvement of LGUs to increase the number of active technicians that could provide timely AI services.

Among the UNAIP beneficiaries included in the survey, more than half (51%) of those who subjected their carabaos to AI were successful in producing calf drop (Figure 9). The carabao raisers interviewed had varying breeds of carabaos that were subjected to AI. These were composed of native, crossbred and purebred animals. A great majority of the AI recipients (87%) raised native species. Only 2% (2 out of 130) carabaos subjected to AI were purebred (Table 18). The success rate of AI did not quite differ among native animals but slightly varied with crossbred carabaos (Figure 10). About 60% of the crossbred animals were able to produce calf out from the AI technology.

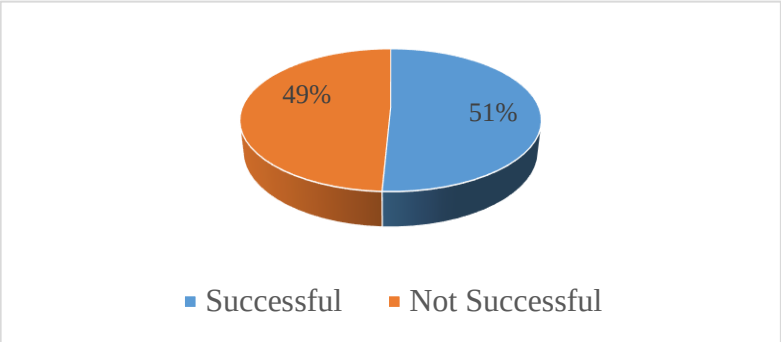


Figure 9. Success of the AI beneficiaries in Samar Island

Table 18. Breed of carabaos subjected to Artificial Insemination in Samar Island

Breed	Number	Percent
Native	115	87.12
Crossbred	2	1.52
Purebred	15	11.36
Total	130	100.00

This could be a reflection on the carabao raisers' attitude and knowledge on AI. Crossbred carabao raisers have already experienced the benefits of upgrading to Murrah buffalo breed (e. g. bigger body size of crossbreds). Moreover, there is a big chance that crossbred raisers already have previous experience in preparing and submitting their carabaos to AI. Hence, they were more well-versed in heat detection and management of their animals to assure higher chances of successful insemination.

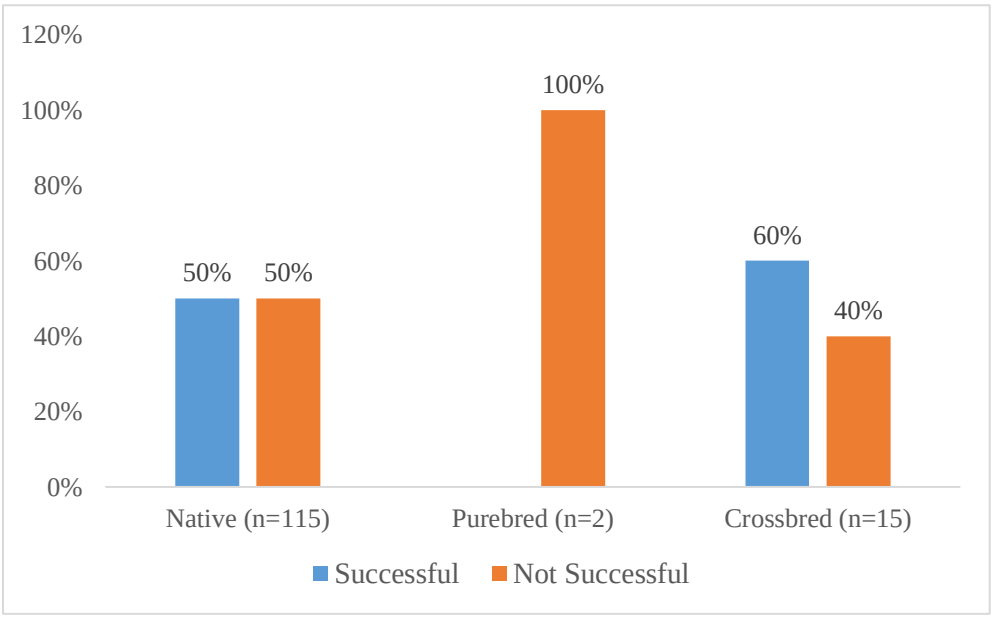


Figure 10. Breed of carabaos raised in Samar Island

Farmers in Samar Island had various means of availing the AI technology. They were either directed by the LGU and PCC or initiated to approach the Office of the Municipal Agriculturist for the purpose. Majority of the AI recipients (57%) were directed by the LGU while a considerable proportion (42%) initiated the availment of the AI service (Table 19). The fact that the farmers submitted their animals to AI upon advice of the LGU or PCC is an indicator of their positive attitude towards AI. This is reinforced by the fact that there were considerable number of farmers who initiated availment of AI by themselves.

More than half (53%) of those who were directed by the LGU did not succeed in producing calf out of the AI service while majority (57%) of those who initiated the availment of the AI service were successful (Figure 11). A possible explanation of this is that when the LGU directed the farmers to submit their animals to AI, the animals were not in the right stage of heat. There is a big chance that the animals had to be subjected to estrus synchronization which has a lower chance of success. Moreover, in the case of animals that were submitted upon direction by LGU, the owners have not adopted adequate preparation of the animals for the AI service.

Table 19. Means of availing artificial insemination for carabaos in Samar Island

Means of Availing AI Service	Number	Percent
Directed by LGU	74	56.92
Directed by PCC	2	1.54
Approached the MAO	54	41.54
Total	130	100.00

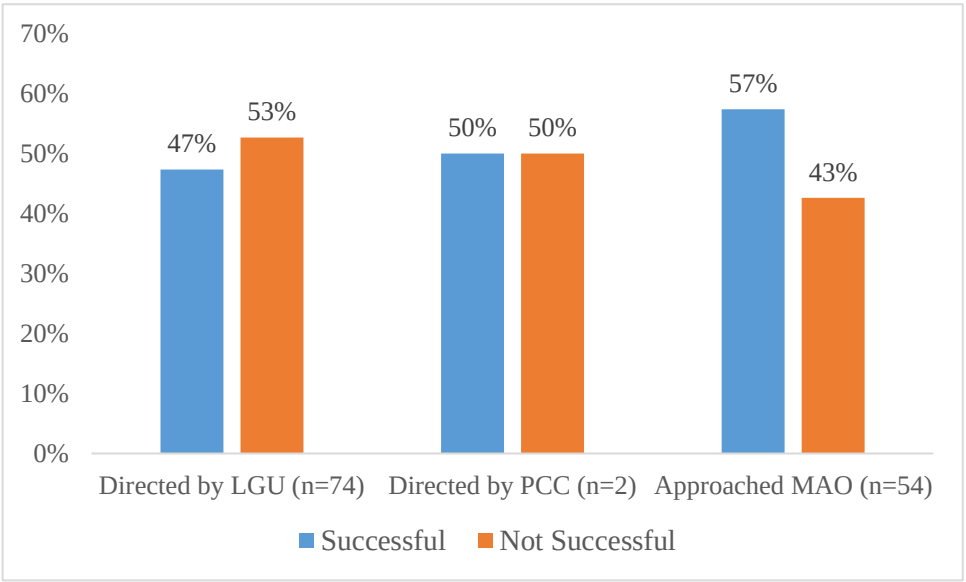


Figure 11. Means of availing AI by carabao raisers in Samar Island

The conduct of AI in Samar Island was done employing two strategies: individual and mass AI. A little less than two-thirds of the recipients (61%) had their carabaos inseminated alone (individual AI). Others had their animals subjected to mass AI (Table 20).

Table 20. Means of conducting Artificial Insemination service in Samar Island

Means of Conducting AI Service	Number	Percent
Individual	79	60.77
Mass AI	51	39.23
Total	130	100.00

The means of conducting AI seemed to affect the success of producing calf. The individual insemination of animals was more effective than mass AI. The former generated a higher rate of success (62%) compared to the latter (35%) (Figure 12). The main explanation for this is that in mass AI, animals are usually induced to come into heat (estrus synchronization). The practice usually has low chance of success if the animal is inseminated at the occurrence of first heat after synchronization. Moreover, animals as well as raisers involved in mass AI have less preparation for the breeding service than those who really approached the AI technicians to avail of the service because the animals involved have come into natural heat. Practices like preparatory management as well as observation for heat have not been implemented by the raisers involved in mass AI. As such, there is a big chance that raisers involved in mass AI were just directed by the LGU, and were not as knowledgeable/capable compared to the raiser who initiated the submission of their animals to AI.

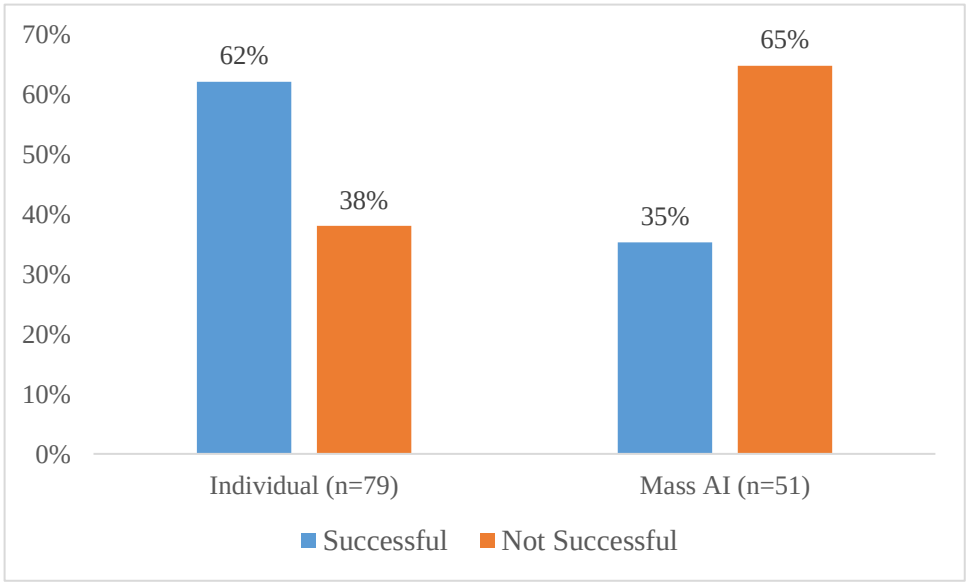


Figure 12. Means of conducting AI in Samar Island

Another important consideration in the conduct of AI is the condition of the animal to be inseminated. These animals could be either in natural heat or not. If they are not in heat, they can be injected with hormone. A great majority of the AI recipients (80%) interviewed had animals which were in heat during insemination (Table 21). It is observed that the animals which were in natural heat during insemiantion tend to be more successful in producing calf (61%) than those injected with hormone (15%) (Figure 13).

Table 21. Condition of the animal during the conduct of Artificial Insemination service in Samar Island

Condition of the Animal	Number	Percent
In natural heat	104	79.39
Injected with hormone	27	20.61
Total	130	100.00

Such is expected because animals in induced heat (e. g. those injected with hormone) may not have a body condition that is appropriate for sustaining a fertilized ovum. As such, fertilization may occur but the body of the female animal may not be able to sustain the growth and development of the fertilized ovum/egg. In its natural state, occurrence of heat that leads to fertilization and calf production is not only determined by hormonal balance (similar to animals injected with hormones). Rather, the more critical factor to consider is the ability of the animal to sustain the development of the fertilized ovum.

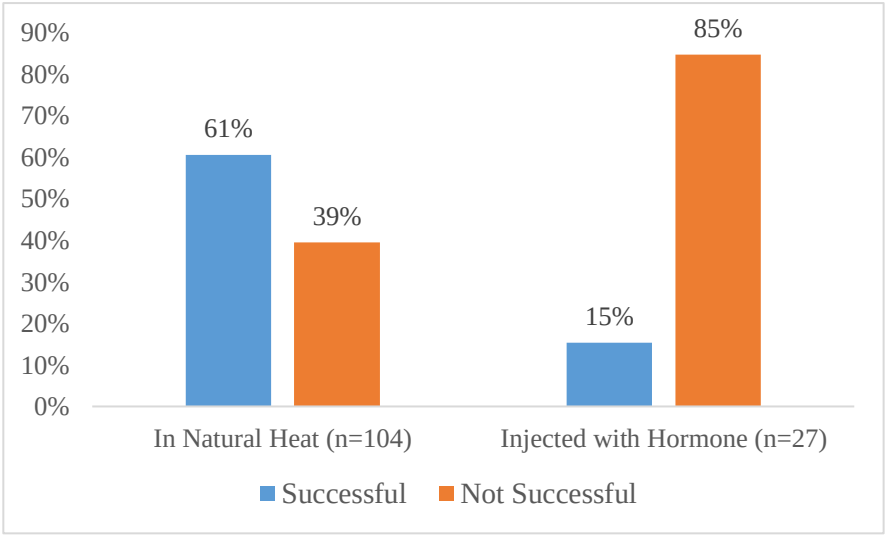


Figure 13. Condition of animal during AI in Samar Island

The AI technician plays a vital role in providing the AI service. He administers the insemination and conducts follow-up visit to check if the animal inseminated is pregnant or not. He also provides information on things to do and not to do with the inseminated animals.

The AI technicians involved in A-PLP provided information to the recipients after insemination. The most common information received by the farmers was the instruction to avoid using the animal for work or subjecting it to stress. Another important instruction was to keep the animal comfortable by providing adequate feed, water and housing.

In Samar Island, a great majority of the AI recipients (73%) revealed that the AI technician who inseminated their carabaos conducted follow-up visit to check if the animal was pregnant (Table 22). In case the animal did not get pregnant during the first insemination, repeat AI can be done. The ideal follow-up visit is 2-3 months after AI service. However, only 38% of the recipients confirmed the follow-up visit of the technician within this period. More than half (55%) of the recipients of the follow-up visit mentioned that said activity was done 3-4 months after the AI service.

Table 22. Follow-up visit by the technician who conducted Artificial Insemination service in Samar Island

Variable	Number	Percent
Conduct of Follow-up Visit		
With follow-up	96	73.3
Without follow-up	35	26.7
Total	131	100.0
Period of Follow-up Visit		
1-2 months after AI service	36	37.5
3-4 months after AI service	52	54.2
5-6 months after AI service	2	2.1
Can not recall	6	6.3
Total	96	100.0

The follow-up visit seemed to influence the success of getting the animals pregnant. Figure 14 shows that those who were able to avail of the follow-up visit by the AI technician had higher success of producing calf (58%) than those who were not visited (31%).

There are two important aims of the follow-up visits after AI. First is to confirm if the inseminated animals did not return to heat after insemination. If the animal returned to heat after insemination, then there was no successful fertilization, and it has to be subjected to repeat insemination. Ideally, follow-up visit for this purpose is done two months after insemination.

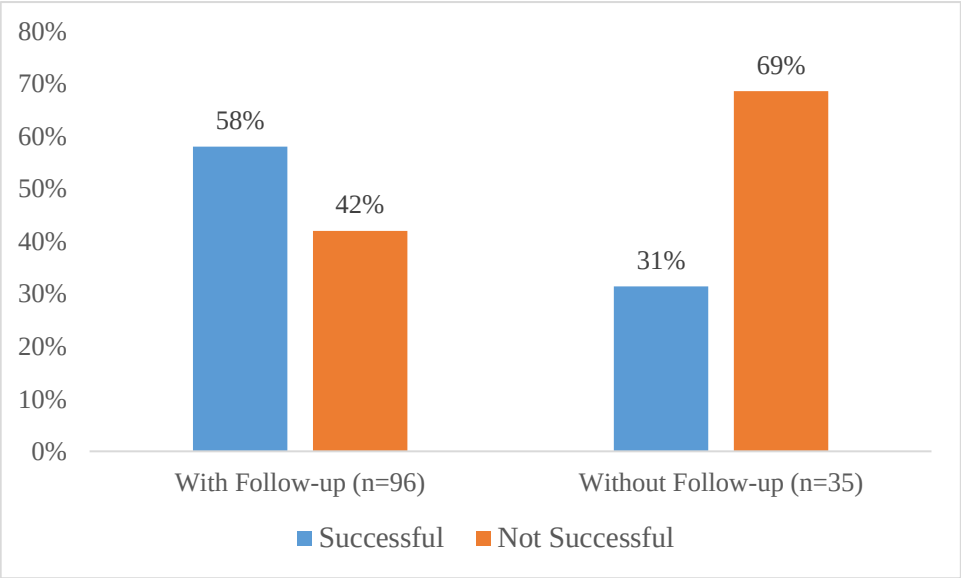


Figure 14. Follow up by AI technician in Samar Island

The other aim of the follow-up visit is to ascertain whether the successful fertilization in fact resulted to pregnancy. This can be done through pregnancy diagnosis (PD) by rectal palpation. The earliest time for a reliable PD is at least three months (3) after AI.

In the case of A-PLP, the follow-up visits were done mostly to confirm if the inseminated animal was pregnant. This was important so that the raiser can better prepare the pregnant animal to assure successful calving. Successful calving entails managing the pregnant cow to avoid stress which might lead to failure of fetal development and abortion.

As such, the follow-up visits conducted by AI technicians enabled successful calving. However, the challenge of increasing success by enabling timely follow-up insemination still had to be established.

4.4.2.3 Factors Influencing Success of AI in Samar Island

A logistic regression was performed to identify some socio-economic and other factors that are hypothesized to influence the success of Artificial Insemination. The dependent variable is *success of AI* which is a binary variable with 0 and 1 values (0 for not successful while 1 for successful). The independent variables were composed of selected socio-economic and farming characteristics of the carabao raisers like age of the farmers, household size, educational attainment, membership in organization, farm area useful for carabao, and attendance to AI training. Moreover, the model included condition of the animal during insemination or use of natural heat, process of insemination, and follow-up visits done by the technicians in order to confirm their influence on the success of AI service.

Results show that the logistic regression model is highly significant but it explains only about 31% (Nagelkerke R^2) of the variation of the dependent variable. This implies that there are other variables that may be related to the success of AI which were not included in the model. The model, however, correctly classified 72% of the cases which highly surpassed the cut-off value for it to become valid.

Table 23 shows the results of the logistic regression analysis. Among the variables included in the model, education, use of natural heat, process of insemination, and follow up visits by the AI technicians were found positively and significantly influencing the success of AI services. This means that more educated raisers whose carabaos are in natural heat and inseminated alone rather than subjected to mass insemination tend to achieve successful AI implementation. Moreover, those who avail of follow up visits by the AI technician are likely more successful.

Education was found positively and significantly related to the success of AI, which implies that the higher the educational attainment of the farmers, the more successful would be the AI implementation. The use of natural heat is as well positively and significantly related to successful AI, which simply validates the fact that it is much better to use the natural heat of the animal than induce them to heat. Based on the coefficient, those in natural heat are about 7 times more likely to get pregnant than those just induced to heat.

Table 23. Logistic regression results for the factors affecting the success of Artificial Insemination in carabaos in Samar Island

Variable	Exp(β)	Significance
Constant	0.013***	0.001
Age	1.005	0.659
Household size	1.061	0.556
Education	1.127**	0.029
Membership in organization	1.644	0.238
Farm area for carabao production	0.965	0.631
Attendance to training	0.864	0.907
Natural heat during insemination	7.411***	0.002
Process of insemination	2.473**	0.044
Follow-up visit by the AI technician	2.413*	0.072

The process of insemination, on the other hand, which is a binary variable for whether the carabao was inseminated alone (value of 1) or in group (value of 0) was also positively significant which implies that it is better to conduct the insemination alone than in groups. Carabaos inseminated alone is more than 2 times likely to get pregnant than those inseminated in group. For one, the animal is exposed to additional stress factors when it is served in a group. Moreover, animals served alone are usually those that were in natural heat; hence had higher chance of success. Lastly, the result also implies that visitation by the technician will really help in the success because it was positively and significantly related to success in AI, based on the analysis. Carabaos that were visited at least twice were likely to be successful than those not visited. This result supports the notion that farmers really need the assistance of the technicians in the

detection and other aspects needed for the AI to be successful, as the concept of AI still needs to be inculcated into the farmers.

4.4.2.4 Differences in Characteristics of the Offsprings from Artificial Insemination with Other Animals of the Recipients

The recipients who succeeded in producing calf from AI were requested to assess the differences in characteristics of said offsprings. These characteristics include size/weight, rate of growth, temperament/ ease in handling, selection and amount of feed consumed, and capacity to work as draft animal. As shown in Table 24, a great majority of the recipients revealed that the offsprings from AI are bigger (85%) and grows faster (84%). This is supported by the stories of most significant change narrated by the recipients that relate to production of better quality offsprings as a result of AI that grow faster and produce more milk. According to one storyteller from Western Samar, "*now I am not only taking care of native carabaos, I already have crossbreeds now… I can sell it at a higher price because it is bigger*." Another storyteller from Western Samar pointed out the capability of the crossbreeds to produce more milk. He said: "*The carabao offspring conceived through AI produces more milk so it is important for us because it was able to help us… it was able to help me in sending my grandchildren to school*."

Table 24. Characteristics of the offsprings from Artificial Insemination in Samar Island

Characteristics	Percent of Successful Beneficiaries (n=67)
Size of offspring	
Bigger	85.1
Smaller	3.0
No difference	11.9
Rate of growth	
Grows faster	83.6
Grows slower	4.5
No difference	11.9
Ease in handling	
Easier to handle	17.9
More difficult to handle	23.9
No difference	58.2
Selection of feed	
More selective	1.5
Not selective	4.5
No difference	94.0
Amount of feed consumed	
Consumes more feed	41.8
Consumes less feed	4.5
No difference	53.7
Capacity to work	
More capacity to work	17.9
Lesser capacity to work	22.4
No difference	32.8
Lazy	22.4
Can not be used as draft animal	4.5

In terms of temperament or ease in handling, selection of feed and amount of feed consumed, majority (53-94%) claimed that these offsprings do not differ from the native carabao. Meanwhile, the recipients had varying opinions on the capacity of the offsprings from AI to work as draft animals. About a third mentioned that these offsprings do not differ from those not produced from AI. Some farmers mentioned that these animals have less capacity to work (22%) and lazy (22%). There were also others who claimed that these offsprings have more capacity to work (18%). This relates to the stories of most significant changes on improvement in the farming capability. Since the animals produced from AI are bigger and stronger than those produced using natural mating, these can help farmers till bigger areas. As one storyteller from Eastern Samar puts it: "*I realized that raising carabaos is important because it helps a lot in our farming [activities] and in providing for our food everyday. I can say that it is really better to use a carabao from AI than a carabao produced through natural mating because the former is stronger and works faster*."

In terms of management, the recipients generally claimed that the offsprings from AI do not require practices on housing, feeding, breeding, and health that were different from those of native carabaos.

4.4.2.5 Management Practices of Carabaos in Samar Island

Table 25 shows the management practices adopted by carabao raisers in Samar Island. Results indicated that slightly more beneficiaries were providing cut-and-carry feed, implementing supervised grazing, deworming, providing vitamins and supplements than the non-beneficiaries. These practices involved additional resources and were geared towards assuring better performance and health of the animals.

These results indicated that there were more UNAIP beneficiaries who were able to allocate resources needed for assuring better health and performance of their animals. As expected, better performing animals like the crossbreds produced from AI have higher requirements for feed and health. Hence, a greater proportion of the UNAIP beneficiaries who can provide such resource was desired.

Table 25. Management practices for carabaos of sample farmers in Samar Island

Practice	Beneficiary		Non-Beneficiary	
	Number	Percent	Number	Percent
Feeding Management				
Tethered grazing	126	96.9	118	99.2
Supervised grazing	4	3.0	1	0.8
Cut and carry	11	8.3	2	1.7
Feeding crop residues	4	3.0	5	4.2
Use of commercial concentrates	1	0.8	-	-
Health Management				
Vaccination against hemorrhagic septicemia (when needed)	1	0.8	1	0.8
Vaccination against foot and mouth diseases	-	-	-	-
Deworming	78	59.1	50	41.7
Delousing/ deticking	2	1.6	2	1.6
Disinfection	2	1.6	-	-
Adminstration of vitamins	10	7.6	4	3.3
Other Management Practices				
Preparation of calving area	3	2.3	6	5.0
Assist cow in calving	4	3.0	5	4.2
Cutting and disinfection of calf's navel cord	1	0.8	8	6.7
Cleaning of calf after birth	7	5.3	6	6.0
Assist calf in suckling	7	5.3	5	4.2
Assist cow in expelling placenta	3	2.3	7	5.8
Uterine flushing	2	1.5	7	5.8
Provide water to newly calved cow	3	2.3	10	8.3
Provide feed to newly calved cow	1	0.8	-	-
Deworming of calf	51	44.7	34	32.1
Deworming of caracow	54	47.4	27	25.5
Use of supplements	6	5.3	2	1.9

4.4.2.6 Changes in the Breed of Carabaos Raised and Breeding Practice Before and After A-PLP

The beneficiaries were asked about the changes they have observed in their respective communities in terms of the breed of carabaos raised by farmers and their breeding practice *before* and *after* the A-PLP. Results indicate that *before* the implementation of the A-PLP in Samar Island, almost all of the sample farmers (97%) were raising native animals. Moreover, the most common practice of breeding (91%) was natural mating with native carabull. *After* A-PLP, natural mating with native carabull drastically reduced, being practiced by only 40% of the farmers. The use of AI *after* A-PLP increased from 1% to 33% while natural mating with crossbred carabulls increased from 6% to 20% (Table 26). Over time, this has led to the reduction in the number of native carabaos and increased the population of crossbred animals. This implies that the A-PLP through the UNAIP has positively influenced the breeding practice of carabao raisers in Samar Island that eventually led to the improvement of the genetic composition of the local herd. The improvement in genetic composition of the animals also resulted to better quality offsprings as revealed by the stories of most significant change

experienced by the AI beneficiaries. Because of AI, the carabao raisers were able to own and raise improved breed of carabaos, which grow faster and produce more milk.

Table 26. Changes in breeding practices and genetic composition of carabaos raised *before* and *after* A-PLP in Samar Island

Variable	*Before* A-PLP		*After* A-PLP	
	Number	Percent	Number	Percent
Breeding Practice				
Natural mating with native carabull	100	90.9	44	40.0
Natural mating with purebred carabull	3	2.7	8	7.3
Natural mating with crossbred carabull	7	6.0	22	20.0
Artificial insemination	1	0.9	36	32.7
Breed of Caracow				
Native	107	97.3	69	62.7
Crossbred	2	1.8	34	30.9
Purebred	1	0.9	7	6.4

4.4.3 Outcomes of the Male Breeder Loan Program

4.4.3.1 Socio-Demographic Characteristics of MBLP Beneficiaries

Table 27 shows some selected socio-demographic and farming characteristics of the beneficiriaries of the Male Breeder Loan Program (MBLP). On average, the farmers were in their late fifties (58 years old). All of them were married and about 3 in every 4 of them were males. Their average educational attainment was 4th year highschool.

Although the MBLP beneficiaries had similar household size (5 members) to the UNAIP beneficiaries, they were a bit older (by an average of 4 years), had more years of attendance in school, and higher income than the UNAIP beneficiaries. Their farms and residences were closer to the road and the input markets than the UNAIP beneficiaries. On the other hand, the MBLP beneficiaries had relatively fewer years of experience in livestock raising and slightly smaller areas devoted to pasturing their animals.

The survey data imply that although the MBLP beneficiaries had relatively more financial resources compared to UNAIP beneficiaries, their relatively shorter experience in livestock raising posed a potential risk for failure in sustaining the activities involved in the MBLP. Although financial resources are important for maintaining the male breeder, the experience of a raiser as well as available area for pasture are also important considerations.

Table 27. Socio-demographic and farming characteristics of MBLP beneficiaries in Samar Island, 2018

Characteristic	Value (n=21)
Age (mean, years)	58
Gender (%)	
Male	76.2
Female	23.8
Civil Status (%)	
Single	
Married	100.0
Widowed/Separated	
Years in School	10.0
Household Size	5.0
Estimated Annual Income (PhP)	164,200.00
House Ownership (%)	
Owned	90.0
Rented	5.0
Others	5.0
No. of years in livestock raising	4
Total Pasture Area (ha)	1.6
Distance of Farm (kms) to	
Nearest Road	0.9
Residence	1.0
Product Market	2.8
Input Market	10.1

4.4.3.2 Implementation of the MBLP

The above results imply the need to look closely at procedures involved in the implementation of the MBLP. Foremost among this was on how the beneficiaries were identified. The survey and interactions conducted by the project revealed that although the DA-RFO8 had advocated procedure on the availment of male breeder loan, compliance was often difficult.

The main problem was synchronizing availability with the request/need for the male breeder. There was also a problem of inadequate number of qualified applicant raisers. As a consequence, only 19% (about one of every five) of the beneficiaries applied for the male breeder loan themselves (Table 28). Moreover, almost half (47%) were granted the loan through previous commitment from the DA-RFO8 or the DA-National Office. The rest of the beneficiaries were identified by either the LGU Agriculture Office (29%) or a farmers' association (5%).

The distribution of the male breeder animal was generally done by DA-RFO8. It was coursed through the concerned LGUs. The DA-RFO8 and LGU duly signed an Invoice-Receipt for Property. This document indicates the purpose of distributing the male breeder animal which is for upgrading of the existing herd. It further stipulates that the breeder animal becomes the property of the LGU, hence will be integrated into the

LGU's Animal Dispersal Program. Moreover, another stipulation was that the repayment scheme will also be determined by the LGU itself.

Table 28. Initiation of MBLP availment by beneficiaries in Samar Island

Entity That Initiated Availment	No. of Beneficiaries	% of Beneficiaries
Beneficiary	4	19.0
LGU Agriculture Office	6	28.5
Farmers' Association	1	4.9
DA-RFO8 commitment	10	47.6
Total	21	100.0

The results of the survey indicate that the farmer-recipients were not generally aware about any requirements/qualifications in availing the male breeder animal. They also believed that they do not have responsibilities associated with the availment of said animals; hence are not required to pay for the loaned animals. In fact, almost all admitted that they have not signed any contract related to the loaned animals (Table 29). A great majority (91%) also revealed that they did not submit any report on the status of the loaned animals. This implies that unlike the AIRP, the LGUs did not treat the male breeder animals from the MBLP as part of their dispersal program. With this, the farmer-recipients remained unaccountable for the loaned animals.

Table 29. Beneficiaries' role in the Male Breeder Loan Program in Samar Island

Variable	Frequency	Percent
Submission of report about the loaned animal		
Submit report	2	9.5
Does not submit report	19	90.5
Contract signing		
Signed contract	1	4.7
Did not sign contract	20	95.3

The results imply the need to review the established procedure in terms of its ability to facilitate application process, attract applicants, and most importantly, identify the right beneficiaries. Apparently, there is also the need to make the program better understood to avoid identification of beneficiaries who are not really equipped and fit to fulfill the objectives of the MBLP.

Identification of the right beneficiaries should consider many factors which require a process that involves different stakeholders. Entities like the LGU Agriculture Office, PAO/PVO, farmers' association and farmers need to have a very good understanding of the objectives and the roles of specific stakeholders of the program. Attaining such would entail that activities be undertaken by the DA-RFO8. These activities need allocation of manpower and other resources.

Achieving success for MBLP does not end with identification of the right beneficiary. Follow-up activities like monitoring and providing support are very critical. These follow-up activities have to be planned out and assigned to appropriate stakeholder entities.

The genetic improvement program of the A-PLP aimed to improve the productive and reproductive potentals of the local herd through the introduction of animals with superior quality genetics. Three of every four loaned male breeders were crossbreds (76%); the rest were purebreds (Figure 15). In terms of species, about half (48%) were goats (bucks) while more than a quarter (28%) were carabulls. The rest were male sheep or rams (Figure 16).

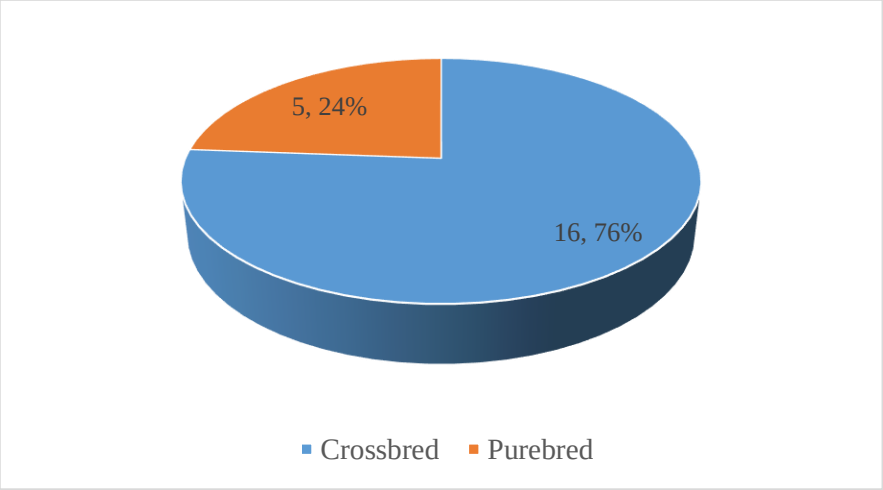


Figure 15. Breed of loaned male breeder animals

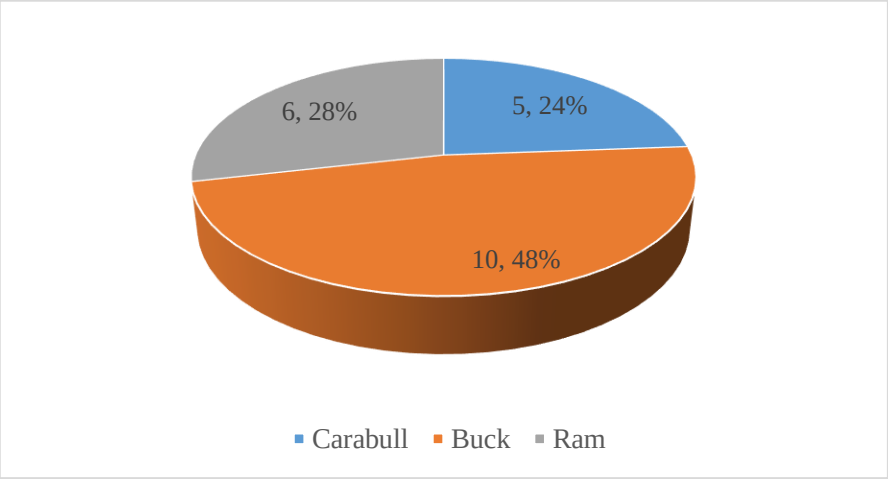


Figure 16. Species of loaned male breeder animals

There were three types of recipients of the male breeder animals. These included individual farmers, farmers' organization and breeding station. A great majority of the recipients (86%) were individual farmers (Table 30).

Table 30. Type of recipients of the MBLP

Type of Recipient	Livestock Species			Total	Percent
	Carabull	Buck	Ram		
Individual farmer	4	8	6	18	85.71
Farmer's Organization		1		1	4.76
Breeding Station	1	1		2	9.52
Total	5	10	6	21	100.00

Results of the survey also revealed that only less than a quarter of the released male breeders (24%) were actively breeding during the time of assessment (Table 31). Others were either sold, slaughtered or died. More than half of the breeder bucks and rams died. Several reasons were cited on the cause of mortality of said animals. These include loss of appetite and hunger, extreme cold, fever, external parasites, and drowning due to flood. On the other hand, more than half of the released carabulls were sold because the raisers had problems in controlling the animals.

Table 31. Status of loaned male breeder animals

Type of Animal	Status (%)			
	Active	Sold	Slaughtered	Died
Carabull	20	60	20	
Buck	40			60
Ram		16.7		83.3

Only one-third of the loaned breeders were able to serve female animals (Table 32). The breeding service was done either to the recipients' own animals (19%) or with animals of other farmers within the barangay (14%). The low proportion of loaned breeders providing breeding services was due to the fact that most of the animals were either sold, slaughtered or died. The breeding service provided by the loaned male breeder animals was very minimal. In fact, only three out of the 21 male breeders were able to provide breeding services to female animals outside of the farm of the male breeder recipients. This implies that the MBLP has not fully achieved the objective of helping improve the productive and reproductive potentials of the local herd in Samar Island.

These outcomes imply the need to revisit and evaluate the procedures in MBLP implementation. Constraints and refinements for improvement need to be identified to enable the program to better achieve its objectives.

Table 32. Location of female animals bred by the loaned male breeders

Location	Number	Percent
Own farm	4	19.0
Within the barangay	3	14.3
Not able to breed	14	66.7
Total	21	100.0

4.4.3.3 Adoption of Recommended Management and Natural Mating Practices

Except for the Breeding Station, the farmer-recipients did not adopt health and other management practices for their male breeder animals. This could have contributed to death of some animals. Moreover, a great majority (90%) did not employ the recommended natural mating practices listed in Table 33. Data indicated that not all of the three recipients who have successfully provided breeding services employed the desired breeding management practices.

Table 33. Adoption of the recommended natural mating practices in Samar Island

Natural Mating Practice	Number (n=21)	Percent
Male breeder mounting and exercise	2	10.0
Acquainting the male breeder with the female animals	2	10.0
Follow-up mating	2	10.0
Mating during colder time of the day	2	10.0
Avoiding female exposure to extreme temperaure or stress after mating	3	15.0
Pen mating (male and female spending overnight in one pen)	2	10.0
Observance of breeding weight of animals	2	10.0
Observance of frequency of male breeder use	2	10.0
Observance of male to female ratio	2	10.0
Observance of female animals for sign of heat	3	15.0

Only one and two of the loaned carabull and bucks, respectively, were able to provide breeding services (Figure 17). Overall, only two native does, one purebred doe and one native caracow have been successfully served by the loaned male breeder animals. This implies that MBLP in Samar Island had a very limited success in achieving its purpose of improving the productive and reproductive potentials of the local herd.

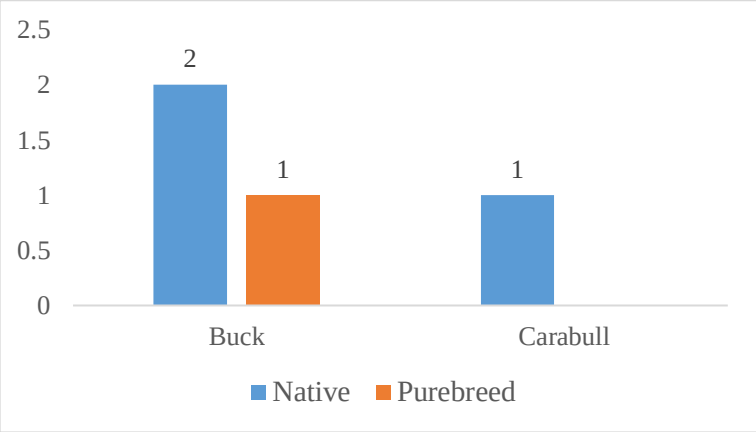


Figure 17. Number of female animals served by the loaned breeder animals

4.4.3.4 Knowledge of the MBLP Recipients on the Recommended Natural Mating Practices

The recipients of the male breeder animals had moderate to high knowledge on the recommended natural mating practices (Table 34). They had high knowledge on male breeder mounting and exercise, follow up mating, mating during colder time of the day, observance of breeding weight, frequency of male breeder use, and male-to-female ratio. Meanwhile, the recipients had moderate knowledge on acquainting the male breeder with the female animals, avoiding female exposure to extreme temperature or stress after mating, pen mating, and observance of female animals for sign of heat. This implies the need to provide additional capability building activities that would enhance farmers' knowledge and adoption of said recommended natural mating practices.

Table 34. Farmers' knowledge on the recommended natural mating practices in Samar Island

Natural Mating Practice	Weighted Score	Description
Male breeder mounting and exercise	2.5	High
Acquainting the male breeder with the female animals	2.0	Moderate
Follow-up mating	2.5	High
Mating during colder time of the day	2.5	High
Avoiding female exposure to extreme temperature or stress after mating	1.67	Moderate
Pen mating (male and female spending overnight in one pen)	1.67	Moderate
Observance of breeding weight of animals	2.5	High
Observance of frequency of male breeder use	2.5	High
Observance of male to female ratio	2.5	High
Observance of female animals for sign of heat	1.67	Moderate

4.4.3.5 Assessment on the Attributes of Natural Mating Using Breeder Animals

The attributes of natural mating using the loaned male breeder animals were assessed by the MBLP recipients. Despite the limited success of the MBLP, they generally agreed that natural mating has relative advantage, simple and compatible with local conditions, provides easily observable effects, and easily adaptable. Moreover, they strongly agreed that the genetic make up of the offspring produced from natural mating is improved compared to mating with native males and that it can be done even without a technical expert (Table 35). This implies that natural mating using superior quality breeds is beneficial, *ceteris paribus*. However, the MBLP was not very successful in achieving its objectives.

Table 35. Perceived rating of MBLP recipients on the attributes of natural mating using the loaned male breeder animals in Samar Island

Attributes of Natural Mating	Weighted Score	Description
Relative Advantage		
Genetic make-up of offspring produced is improved compared to native breeds	3.5	Strongly agree
Genetic make-up off offspring produced is improved compared to AI	3.4	Agree
Higher success rate of impregnation than AI	3.0	Agree
Requires less labor in breeding than AI	3.0	Agree
Simplicity		
Natural Mating is simpler breeding practice than AI	3.0	Agree
Purebred breeder is easier to handle than native breeder during mating	3.0	Agree
Can be done even without technical expert	4.0	Strongly agree
Compatibility		
Natural mating using purebred breeder is acceptable to farmers to breed their animals	3.0	Agree
Natural mating using purebred breeder is adoptable to local condition and resources	2.5	Agree
Observability		
The advantage/benefits of natural mating are clear and observable	3.0	Agree
The physical attributes of offspring of purebred breeders thru natural mating is observable even when they are still young	3.0	Agree
Natural mating ascertains success of conception/impregnation immediately	3.0	Agree
Trialability/Adaptability		
Can be done using all breeds of _____	3.0	Agree
Can be done any time of the day when the female animal is in-heat	2.7	Agree
Can be done even without technical experts than AI	2.7	Agree

4.4.3.6 Benefits from the Male Breeder Loan Program

The MBLP primarily aimed to upgrade the exsting stocks of farmers. However, more than three-fourths of the recipients (76%) revealed that they did not obtain any benefits from the MBLP (Figure 18). This is attributed to the fact that they were not able to breed the loaned male breeder animals due to several reasons that included selling, slaughtering and death of said animals. Those who were successful in providing breeding services claimed that the program enabled them to updgrade the genetic composition of their animals and produce more offsprings especially for goats.

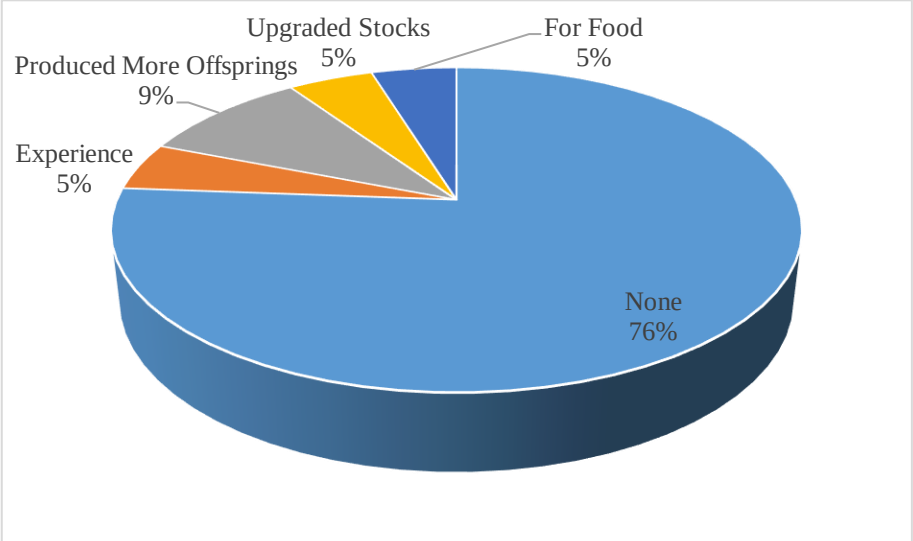


Figure 18. Benefits from the Male Breeder Loan Program

4.4.4 Outcomes of the Animal Infusion and Restocking Program

This section presents information on the Animal Infusion and Restocking Program (AIRP) involving the fund-transfer scheme from DA-RFO8 to the various LGUs across provinces especially after Typhoon Yolanda.

4.4.4.1 The Fund-Transfer Scheme of Animal Infusion

One of the two animal infusion and restocking programs implemented during the A-PLP involved fund transfer to LGUs which was proposal-based. This accounted for differences in the amount provided to specific beneficiary LGU. A total of PhP17.72 million was transferred by DA-RFO8 to the various LGUs across provinces in Samar Island for animal infusion after Typhoon Yolanda. Half of the LGUs (50%) received between PhP250,000-PhP300,000. On the other hand, two MLGUs from Northern Samar (Lapinig and Palapag) received the highest allocation (PhP2.725 million each). These were followed by LGU Lawaan (Eastern Samar) that received PhP2 million and LGU Catubig (Northern Samar) and LGU San Julian (Eastern Samar) that were allocated PhP1.75 million each.

Apart from the total PhP550,000 released to the two LGUs that were not visited, only a little over three-fourths (77%) of the remaining funds has been utilized to purchase livestock species for dispersal to intended beneficiaries (Figure 19). Two LGUs were still in the process of procurement as they encountered procurement-related problems, causing the delay. The other LGU which received PhP2 million was not able to utilize the funds due to some internal problems during the period of fund transfer. The checque has expired and became stale; hence it was returned to DA-RFO8. This LGU could have purchased more animals compared to its counterpart LGUs that received smaller amount. This problem could have been avoided if proper monitoring was done.

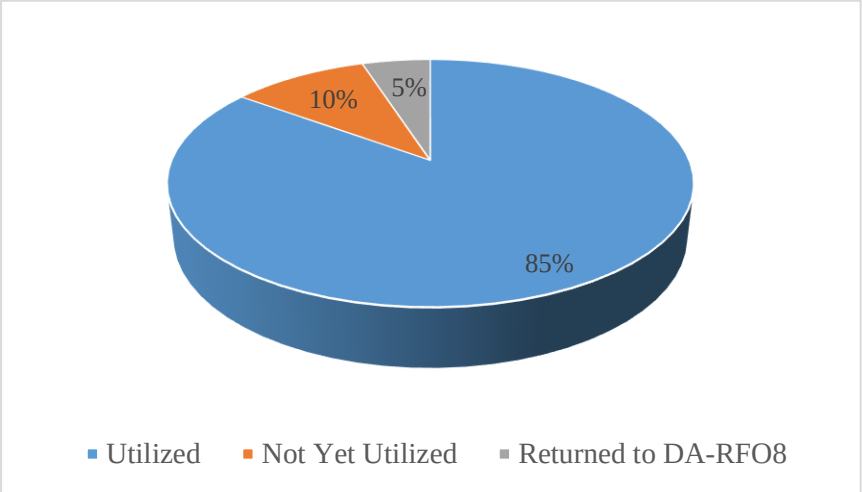


Figure 19. Status of fund utilization for animal infusion after Super Typhoon Yolanda

Although the fund transfers were reportedly processed in 2014 and 2015, procurement of animals and dispersal by the MLGUs were done only in 2016 (41%) and 2017 (41%) due to some issues about processes related to the government procurement system and lack of suppliers (Figure 20). A couple of LGUs even had the dispersal only in 2018 and early 2019. Generally, delays were experienced in the utilization of the funds released for this scheme. The common problem of delayed implementation implies the need to evolve strategies to expedite implementation of the scheme.

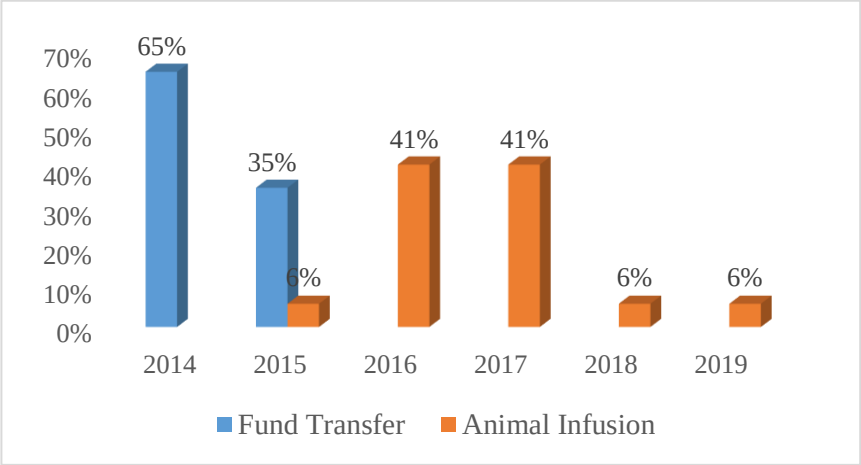


Figure 20. Year of fund transfer and animal infusion

It was observed that MLGUs which received more than PhP1 million were proposing infusion of carabaos. Although expensive and thus would only enable a few beneficiaries, carabaos were considered important due to their utility as draft animal (*e. g.* plowing and harrowing of fields as well as hauling of farm produce). This was exemplified by the municipality of Catubig, Northern Samar where carabao was a very important commodity. The animal can even be rented out at a rate of 10 to 15 cavans of paddy rice per cropping season.

The number of recipients of the AIRP per LGU varied depending on the amount of funds provided and the type of animals purchased. As such, recipients of carabaos were generally lesser in number than the recipients of swine. In general, each recipient received only one head of animal.

Several livestock species were purchased by the LGUs from the funds transferred by DA-RFO8 for the animal infusion program. These species involved goat, chicken, swine, carabao, and cattle. A total of 1,633 heads of animals were dispersed across provinces (Table 36). A considerable proportion (38%) of the infused animals were goats, followed by chicken (26%) and swine (21%) (Figure 21).

Table 36. Species and number of livestock purchased and infused by LGUs in Samar Island after Typhoon Yolanda

Livestock Species	Number	Percent
Goat	622	38.1
Chicken	426	26.1
Swine	346	21.2
Carabao	157	9.6
Cattle	82	5.0
Total	1,633	100.0

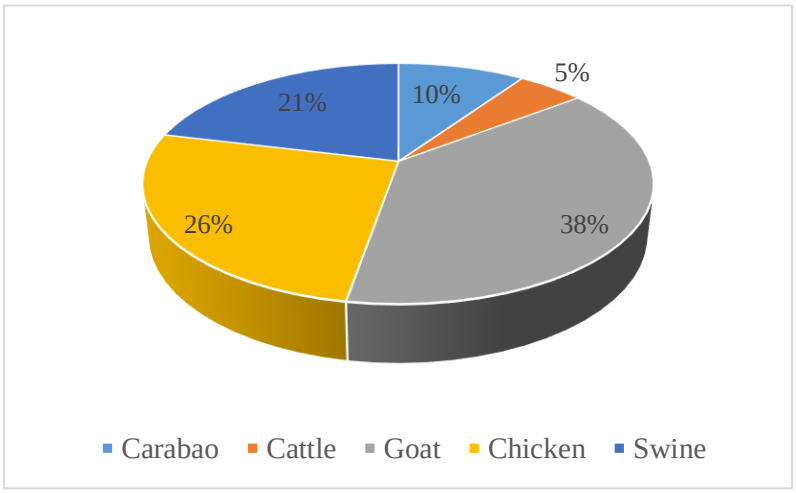


Figure 21. Distribution of livestock infused by species

Not all of the dispersed animals were utilized by the beneficiaries. A number of said animals have died (Figure 22). Among the livestock species, goats had the highest mortality (41%). This was followed by swine (33%) and chicken (19%) (Figure 23). It was reported that mortality of goat was due to diseases like orf. According to the LGU technicians, most of those which died were not provided with housing. This happened especially among those who received the animals even though they were not the intended beneficiaries. Due to intervention by some local politicians, those who were not trained and were not able to provide housing for the goats became instant beneficiaries. This implies the need to adopt measures that would deter unnecessary political interventions in the implementation of dispersal programs.

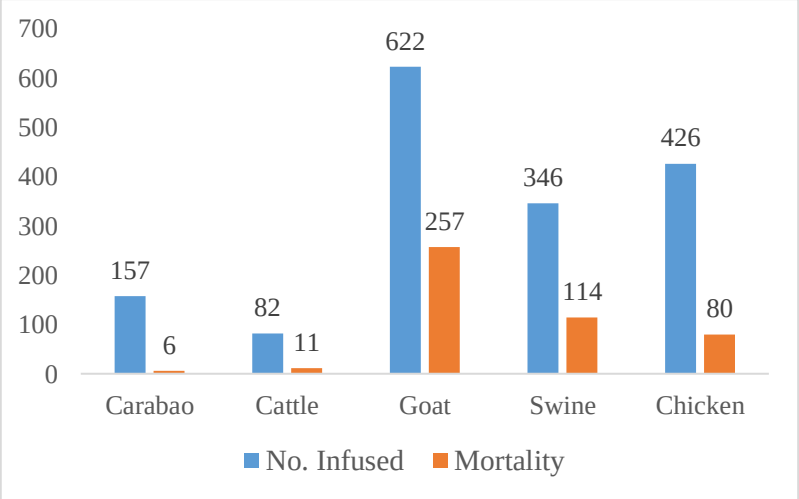


Figure 22. Number of livestock infused and mortality by species

Swine was the most productive among the livestock species infused. However, it also incurred considerable mortality as exemplified by those due to the occurrence of severe flooding in Jipapad LGU that practically killed the 100 heads infused. Since the reason for the death of animals was force majeure, the recipients were not required to pay.

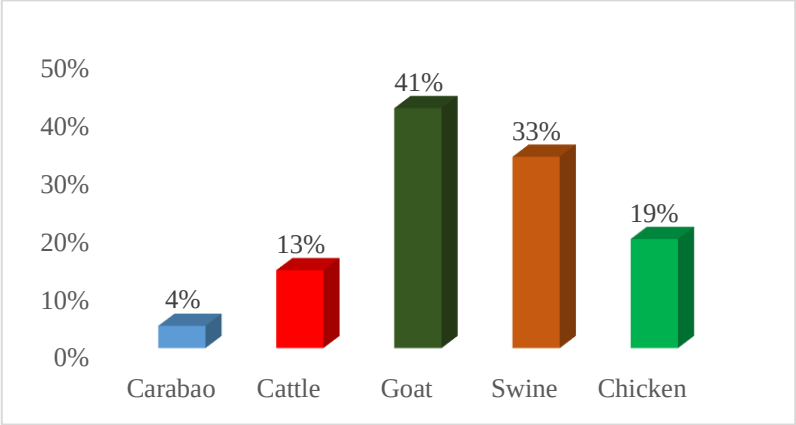


Figure 23. Mortality rate of livestock species infused

The AIRP adopted the dispersal scheme of infusing livestock species in Samar Island. The total number of beneficiaries for the various livestock species infused across provinces from the allocation was 846 (Figure 24). As of the time of evaluation, only about 15% of the beneficiaries have repaid for the dispersed animals. What is noteworthy is the re-dispersal of the animals paid by the original beneficiaries. To date, there are 181 second generation beneficiaries, a great majority of whom received swine. Continued monitoring by the LGUs on the beneficiaries and their corresponding repayments will further increase reach of re-dispersal and eventually affect into restocking of animals.

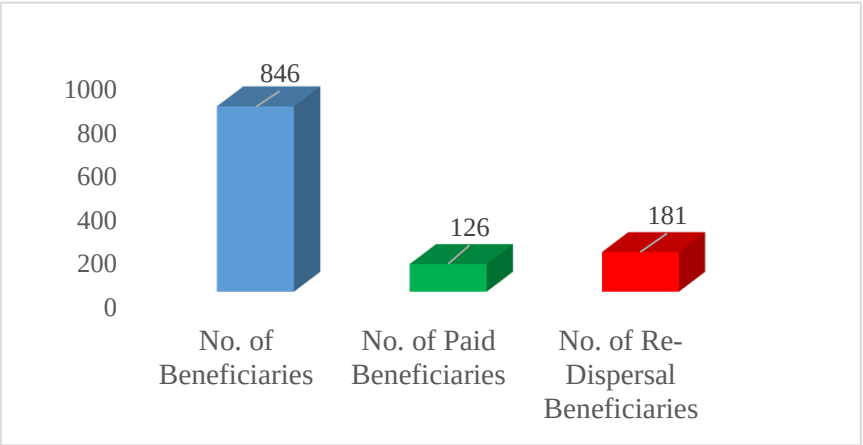


Figure 24. Number of beneficiaries who availed of and paid the animals as well as number of beneficiaries for the re-dispersal

4.4.4.2 Socio-Demographic Characteristics of Swine Dispersal Beneficiaries

Among the 50 beneficiaries included in the survey for the AIRP, 18 farmers received swine. On average, the swine-raiser beneficiaries were in their early fifties (51 years old) (Table 37). The beneficiaries surveyed were equally divided into males and females. Most of them were married and had an average household size of 5. Their average educational attainment was 11 years, which was higher than UNAIP and MBLP beneficiaries. Their average annual household income was slightly higher than UNAIP beneficiaries but were lower than those of the MBLP and SAIS RED beneficiaries.

Table 37. Socio-demographic characteristics of animal (swine) infusion beneficiaries in Samar Island, 2018

Characteristic	Value (n=18)
Age (mean, years)	51
Gender (%)	
Male	50.0
Female	50.0
Civil Status (%)	
Single	5.6
Married	94.4
Widowed/Separated	--
Years in School	11.0
Household Size	5.0
Estimated Annual Income (Php)	107,715.63
House Ownership (%)	
Owned	80.0
Rented	14.3
Others	5.7
No. of years in livestock raising	18.35
No. of Years in Swine Raising	2.47

Although the beneficiaries have had long experience in livestock raising, they had relatively short experience in swine raising. This indicates that the selection process for beneficiary needed improvement in terms of choosing more experienced swine raisers. Adopting such would increase chances of higher success and repayment rates.

4.4.5 Outcomes of the Samar Island Small Ruminant Rural Enterprise Development Project

Unlike other activities in Samar Island which were continuing (already existing before the A-PLP), the SAIS RED project was a research and development initiative that was started and ended during the A-PLP. Being such, the procedures adopted by the SAIS RED project were all implemented in a relatively recent period of time. As such, commitments from the LGU and Provincial Agriculture/Veterinary Offices, as well as the DA RFO8 were all made by personnel who were also involved in the SAIS RED project activities. In the case of the continuing/on-going activities, the commitments

might have been made by personnel who were already non-existent (and replaced by new personnel). The new personnel may have less depth of knowledge on the essence of the activities, and may have needed re-orientation by DA RFO8.

4.4.5.1 Socio-Demographic Characteristics of Goat Raisers

The animal raisers who participated in the SAIS RED project activities (beneficiaries) had an average age of 58 years (Table 38). They were older by three years than the nearby raisers who did not participate in SAIS RED (non-beneficiaries). Most of the beneficiaries and a little less among the non-beneficiaries were males. Almost all the beneficiaries and non-beneficiaries were married, had households that consisted of four members and were inhabiting houses owned by the family. The average educational attainment among all raisers was in the secondary level, with beneficiaries having a year more in school than the non-beneficiaries.

Table 38. Socio-demographic characteristics of the SAIS RED project beneficiaries and non-beneficiaries in Samar Island, 2018

Characteristic	Beneficiaries (n=58)	Non-Beneficiaries (n=59)
Age (mean, years)	56	53
Gender (%)		
Male	82.8	71.2
Female	17.2	28.8
Civil Status (%)		
Single	6.9	8.5
Married	92.4	88.1
Widowed/Separated	1.7	3.4
Years in School	13.0	12.0
Household Size	4.0	4.0
Estimated Annual Income (Php)	226,579.93	87,366.38
House Ownership (%)		
Owned	89.7	93.2
Rented	1.7	--
Others	8.6	6.8
No. of years in livestock raising	21.4	14.4
No. of years in goat raising	10.5	6.3
Total Pasture Area (ha)	2.6	2.3
Total Farm Area (ha)	8.8	3.7
Land Ownership (%)		
Owner	60.3	71.2
Tenant	29.3	23.7
Leaseholder	1.7	3.4
Others	8.6	1.7
Distance of Farm (kms) to		
Nearest Road	0.8	0.9
Residence	1.9	1.8
Product Market	6.9	6.0
Input Market	13.0	7.1

A major difference between the SAIS RED project beneficiaries and non-beneficiaries was the annual income. On average, the beneficiaries had annual incomes that were 230% higher than the non-beneficiaries. This implies that the A-PLP was able to get the participation of goat raisers who had higher potential for commercialization of the SAIS RED project activities. They were raising a relatively larger number of animals and had considerable resource endowment that would enable them to easily adopt the SAIS RED technologies and apply these to commercial goat production. Overall, the SAIS RED project beneficiaries had higher average income and larger farm sizes than non-beneficiaries.

Moreover, raisers who participated in the SAIS RED project had longer experience in livestock and goat production than the non-beneficiaries. All these imply that the SAIS RED project was able to select the right target beneficiaries.

4.4.5.2 Reasons for Joining the SAIS RED Project

The farmers cited several reasons for joining in the SAIS RED project (Table 39). Their main motivation was to increase income from goat raising. About half (47%) hoped to reduce mortality and eventually increase productivity of their goats. Others wanted to develop linkage and gain additional knowledge on goat raising, improve the genetic composition of their animals and engage in goat enterprise like milk production.

Table 39. Reasons of beneficiaries for joining the SAIS RED Project

Reason*	Number	Percent
Increase income	31	53.4
Reduce mortality/ increase productivity	27	46.6
Develop linkage	8	13.8
Gain additional knowledge	7	12.1
Improve genetic composition	6	10.3
Engage in goat enterprise	5	8.6

* Multiple response

4.4.5.3 Adequacy and Usefulness of the Capability Building Activities Conducted by the SAIS RED Project

The SAIS RED project conducted several capability building activities that aimed to enhance the management and entrepreneurial capabilities and skills of the goat farmers. These included trainings and educational tour. The trainings focused on the following: (a) forage pasture development and dairy production, (b) goat check production system-cum-enterprise development, (c) urea-molasses mineral block processing, salt and concentrate supplementation, and (d) artificial insemination on goats-cum-chevon and milk processing. The farmer-partners were also exposed to some progressive goat farms in Luzon and Mindanao through educational tour (*Lakbay-Aral*).

Table 40 shows the results of the assessment by the farmer participants on the adequacy and usefulness of the capability building activities. On average, said activities were found by the goat farmers as adequate and useful. In addition, the educational

tour/*Lakbay-Aral* that exposed the farmers to progressive goat farms was assessed to be very useful. These findings are supported by the stories of significant change narrated by the beneficiaries claiming that the capability-building activities broadened the knowledge of farmer-partners on goat raising. The additional knowledge helped them increase the number of animals. Moreover, they were also able to share to others their knowledge about goat raising. As one storyteller from Mercedes, Western Samar narrated: "*My knowledge about goat raising widened… This change helped me in properly raising and increasing the number of my goats*." Another storyteller from San Isidro, Northern Samar shared: "*Before, I did not care about goat raising. Since I attended the training, I gained knowledge and was able to use it for my animals*." Meanwhile, a farmer from Sta. Rita, Western Samar revealed that he experienced change "*when I learned how to take care of goats. Many people are now coming to our place to ask for suggestion and to gain more knowledge*".

Table 40. Adequacy and usefulness of the capability building activities of the SAIS RED Project

Capacity Building Activity	Adequacy		Usefulness	
	Weighted Score	Description	Weighted Score	Description
Training Course on Forage Pasture Development and Dairy Production	4.15	Adequate	2.33	Useful
Technological Training on Goat Check Production System-cum-Enterprise Development	3.93	Adequate	2.20	Useful
Training on Urea-Molasses Mineral Block Processing/ Production, Salt and Concentrate Supplementation	4.24	Adequate	2.28	Useful
Training on Artificial Insemination on Goats-cum-Chevon and Milk Processing	3.85	Adequate	2.15	Useful
Educational Tour/ *Lakbay-Aral*	4.16	Adequate	2.53	Very useful

4.4.5.4 Adoption of Innovative Goat Production System Technologies

The SAIS RED project likewise demonstrated several innovative goat production system technologies to its beneficiaries. As a result of the SAIS RED activities, a higher proportion of the beneficiaries were implementing these innovative practices as shown in Table 41. These practices were also adopted by non-beneficiaries, but at lower rates (number of adopters). The innovative practices that were adopted by considerably higher proportion of beneficiaries compared to non-beneficiaries were on separation of expectant does, culling of unproductive does, deworming, vaccination against foot and mouth disease, and farm record keeping.

Table 41. Innovative goat production system technologies adopted in Samar Island, 2018

Innovative Management Practice	Type of Respondent			
	Beneficiary		Non-Beneficiary	
	Number	Percent	Number	Percent
Confinement of goats during rainy periods only	47	81.0	43	72.9
Elevated housing	48	82.8	39	66.1
Separating uncastrated male from female kids	32	55.2	25	42.4
Separating male from female weanlings/ growers	29	50.0	25	42.4
Separating expectant does	42	72.4	34	57.6
Feeding newborn with colostrum/ first milk	42	72.4	26	44.1
Washing of buck's face	11	19.0	10	17.0
Culling of unproductive does	25	43.1	11	18.6
Deworming	37	63.8	25	42.4
Vaccination for foot and mouth disease	24	41.4	17	28.8
Vaccinated for hemorrhagic septicemia	15	25.9	10	17.0
Farm record keeping	24	41.4	3	5.1

One of the outcomes of the SAIS RED project is change in practice of the goat raisers. This is exemplified by the adoption of the above new technologies in goat raising. Such is also supported by the stories of most significant change narrated by the beneficiaries.

4.4.5.5 Personal Enterpreneurial Competencies of Sample Goat Farmers

The SAIS RED project aimed to enhance the capabilities of the farmer-partners in undertaking and utilizing innovative goat production and management system technologies. Moreover, it hoped to empower them in the operation and management of goat-based enterprises. Given the various capability building activities, the personal entrepreneurial competencies (PEC) of beneficiaries were assessed in terms of the following: (a) demand for quality and efficiency, (b) opportunity-seeking, (c) risk-taking, (d) persuasion and networking, (e) information-seking, and (f) systematic planning and monitoring. The mean PEC scores were then compared between farmers *with* and *without* entrepreneurial trainings using T-test.

Results show that the goat raisers who attended entrepreneurship trainings had higher mean PEC scores across the six competencies than those who did not participate. However, only the mean scores on demand for opportunity seeking, quality and efficiency as well as systematic planning and monitoring were statistically different between farmer-partners and non-participants (Table 42). This implies that those who participated in trainings learned to do things before being asked, and to seize unusual business opportunities. Moreover, they try to find ways to do things better, faster or cheaper as well as use procedures to ensure that work performed meets the quality standard. Furthermore, they are able to plan or revise plans as appropriate and keep farm records for informed decision making. This is supported by the previous finding that a

considerable proportion of the beneficiaries (41%) kept farm records compared to the non-beneficiaries (5%).

Table 42. Mean PEC scores of goat farmers in Samar Island

Personal Entrepreneurial Competency	Beneficiary (n=58)	SD	Non-Beneficiary (n=59)	SD	*t* value	*p* value
Opportunity seeking	17.45	2.94	16.39	3.72	1.71	0.09*
Demand for quality and efficiency	17.93	2.47	17.08	2.96	1.68	0.10*
Risk taking	15.59	3.04	14.83	4.07	1.14	0.26
Information seeking	18.22	3.03	17.81	3.00	0.74	0.46
Systematic planning and monitoring	19.40	2.84	18.25	2.97	2.13	0.04**
Persuasion and networking	18.12	3.00	17.32	3.29	1.37	0.17

**Significant at α=0.05; *Significant at α=0.10

The PEC scores of the goat farmers were used to classify them into different modes. The modes and corresponding percentage of respondents for the PECs based on the PEC classifications are presented in Table 43. The competencies are classified as follows: (1) strong if PEC score is 19 points and above, (2) moderate if score is between 16 to 18 points and weak when score is 15 points and below.

Table 43. PEC modes of goat farmers in Samar Island

Personal Entrepreneurial Competency	Beneficiary (n=58)	Mode	%	Non-Beneficiary (n=59)	Mode	%
Opportunity seeking	Moderate	17	29.3	Moderate	19	32.2
Demand for quality and efficiency	Moderate	26	44.8	Moderate	24	40.7
Risk taking	Weak	17	29.3	Weak	30	50.9
Information seeking	Moderate	19	32.8	Moderate	21	35.6
Systematic planning and monitoring	Strong	38	65.5	Moderate	15	25.4
Persuasion and networking	Moderate	19	32.8	Moderate	21	35.6

Both the SAIS RED project beneficiaries and non-beneficiaries had moderate competencies in opportunity seeking, demand for quality and efficiency, information seeking as well as persuasion and networking. Both groups had weak risk-taking competencies. However, the SAIS RED beneficiaries had strong competency in systematic planning and monitoring, while non-beneficiaries only had moderate competency in that category.

This implies that there is still a need to further improve the entrepreneurial competencies of the goat raisers in Samar Island. Moreover, preferential attention should be given to strengthening the risk-taking competency of the farmers.

4.4.5.6 Goat and Allied Enterprises

One of the objectives of the SAIS RED project was to facilitate establishment of goat and allied enterprises. As such, the existence of goat and allied enterprises was assessed among beneficiaries and non-beneficiaries, both *before* and *after* the SAIS RED project implementation.

Table 44 presents the goat and allied enterprises of farmers in Samar Island *before* and *after* the implementation of the SAIS RED project. The proportion of SAIS RED beneficiaries who were selling fatteners was the same *before* and *after* the A-PLP. On the other hand, the proportion of non-beneficiary goat raisers selling fatteners was lower *after* the A-PLP. This implies that the SAIS RED beneficiaries were able to either maintain or improve the performance of their herd, sustaining the production and subsequent sale of fatteners. The opposite is true with the non-beneficiaries.

Table 44. Goat and allied enterprises of sample farmers *before* and *after* SAIS RED in Samar Island

Type of Goat Sold	% of Beneficiaries (n=58)		% of Non-Beneficiaries (n=59)	
	Before	After	Before	After
Fattener	12.1	12.1	1.7	8.5
Culled Doe	8.6	12.1	1.7	3.4
Culled Buck	5.2	1.7	--	6.8
Breeder Doe	24.1	19.0	6.8	20.3
Breeder Buck	17.2	24.1	3.4	15.3
Buck service	1.7	1.7	--	--
Forage planting material	--	3.4	--	--
Goat milk	--	3.4	--	--
Goat meat	1.7	1.7	--	1.7

The proportion of both beneficiaries and non-beneficiaries who were selling culled does increased *after* the SAIS RED project. Such is a reflection of the increased effort among goat raisers to improve the quality of their does by culling undesirable ones during the project.

The proportion of beneficiaries selling culled bucks decreased *after* the SAIS RED, while the proportion of non-beneficiaries increased. The latter implies an increased appreciation of selecting, as well as availability of, good quality bucks among non-beneficiaries. On the other hand, the beneficiaries were already able to raise good quality bucks during the project such that they were not culling their bucks afterward. Instead, they sold the bucks as breeders before these animals reached culling state.

Meanwhile, the proportion of beneficiaries selling breeder does decreased *after* the project. This indicates that beneficiaries were increasing their herd population by retaining more does. On the other hand, more non-beneficiaries were selling out breeder does, indicating that they have reached the limit in the number of does that they were willing to raise.

At the time of the survey, a few enterprises have started to emerge out of the capacity building activities participated in by SAIS RED beneficiaries. Emergence was still at a very early stage and the emerging enterprises were practiced by just a very few beneficiaries (two for each enterprise). These enterprises were sale of forage planting materials and sale of goat's milk.

On the other hand, provision of paid buck breeding service and sale of goat meat was sustained among beneficiaries. Moreover, one non-beneficiary engaged into paid buck breeding service enterprise *after* the project.

4.4.5.7 Status of the Goat Raisers' Organizations

Aside from conducting capability building activities, the SAIS RED project organized or facilitated the strengthening of existing farmers' organizations. During project implementation, 11 farmers' associations were formed/activated: five in Northern Samar, four in Eastern Samar and one in Western Samar. In addition, these organizations across Samar Island were formed into the Samar Island Rural Enterprise Goat Association Integrated Network (SAIS REGAIN).

Due to peace and order concerns, three out of the 12 organizations were not visited. Only 44% of the organizations monitored were found active (Figure 25). These were mostly organizations that already existed before SAIS RED project implementation. It was reported that the inactivity of the organizations was primarily due to absence of meetings after project implementation. This means that leadership of the concerned organizations might not have been that strong yet. Moreover, the farmer-partners particularly from the Palapag Livestock Raisers' Association (PALIFA) suffered setbacks in their goat raising due to Typhoons Glenda and Nona.

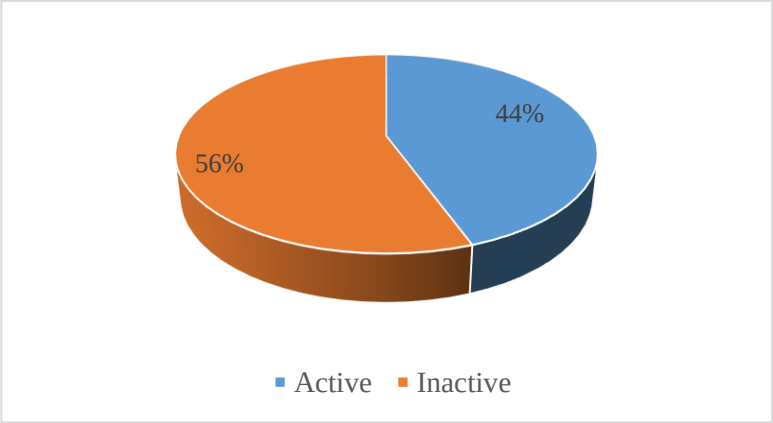


Figure 25. Status of SAIS RED organizations

It was learned that individual farmers continued with goat raising despite the inactivity of their respective organizations. The concerned LGUs should therefore revive and capacitate these organizations as they can provide support especially in enhancing the emerging goat enterprises and further developing the personal entrepreneurial competencies of goat raisers.

4.4.6 Other Outcomes of the Agri-Pinoy Livestock Program

4.4.6.1 Client Reach of Selected A-PLP Services

Aside from the technical services and infusion of animals through the UNAIP, SAIS RED and AIRP, the A-PLP also provided production support services like forage seeds and rootstocks as well as veterinary drugs and biologics. The latter was in the form of vaccines, dewormers and vitamins. These services were provided through the Provincial Veterinary Offices (PVOs), breeding stations/Livestock Production Centers and LGUs.

The extent of service provision or client reach among carabao and goat raisers in Samar Island was also evaluated. As shown in Table 45, both program beneficiaries and non-beneficiaries availed of production support services. However, more beneficiaries were able to avail of the various services during the A-PLP period compared to non-beneficiaries. This implies that the A-PLP was able to introduce its other services to the beneficiaries of its main programs. This is good as it is. However, there might be a need to introduce DA-RFO8's other services to the non-beneficiaries. This would entail more advocacy activities.

The forage/pasture planting materials were distributed to more goat raisers (42%) than carabao raisers (4%). This implies that the available forage/pasture materials might be more suitable to goats than carabaos. Among the biologics, dewormers were availed by considerably high proportions of carabao (47%) and goat (41%) raisers. This is contradictory to the availment of vaccines by few farmers for both livestock species. This indicates that livestock raisers in Samar Island are inclined to deworm their animals rather than subjecting them to vaccination. Provision of vitamins to carabaos and goats has also been observed.

Table 45. Availment of selected services provided by DA-RFO8, LGUs and Livestock Stations in Samar Island

Service Provided/ Livestock Species	Beneficiary		Non-Beneficiary		All Farmers	
	Frequency	% Share to Total Respondents	Frequency	% Share to Total Respondents	Frequency	% Share to Total Respondents
Forage/ Pasture Materials						
Carabao	8	6.1	1	0.8	9	3.6
Goat	44	75.9	5	8.5	49	41.9
Vaccines					7	
Carabao	11	8.3	5	4.2	16	6.3
Goat	7	12.1	6	10.2	13	11.1
Dewormer						
Carabao	79	59.8	39	32.5	118	46.8
Goat	27	46.6	21	35.6	48	41.0
Vitamins						
Carabao	20	15.2	10	9.2	30	11.9
Goat	19	32.8	12	20.3	31	26.5

The inclination of livestock raisers not to subject their animals to vaccination could be explained by past experiences with Hemorrhagic septicemia (Hemosep) in carabaos a few decades ago. The carabao raisers at that time subjected their animals to vaccination when the disease has already occurred in the areas. As such, instead of building up the immunity of their carabaos, Hemosep vaccination aggravated the occurrence of the disease, often resulting to death.

Data show that the client reach of the above-mentioned services should be increased especially for vaccination and vitamin supplementation. This would require increasing efforts to educate farmers on the benefits from engaging in said management practices and the concurrent provision of additional supply of drugs and biologics.

4.4.6.2 Adequacy of Trainings and Incentives Availed by the Agricultural Extension Workers

Aside from providing trainings on livestock production to farmers, the Livestock Program Management Unit of DA-RFO8 also facilitated capacity building among Agricultural Extension Workers (AEWs). Monetary incentive or salary augmentation was likewise provided to AEWs who were devolved at the various LGUs to encourage them to continue the implementation of DA's Program and Projects. The AEWs rendered routine services like treatment of sick animals, vaccination, supplementation, monitoring, artificial insemination, castration, and other livestock-related activities.

The following mechanics were adopted in the provision of incentives: (1) Local Chief Executive deploys personnel or staff to implement livestock programs; (2) Deployed Municipal Agriculture Personnel submits report to the Provincial Veterinary Office (PVO) every 25th of the month for consolidation; (3) PVO submits the consolidated report to DA-RFO8; and (4) DA-RFO8 pays the incentive in the amount of PhP2,000.00 monthly per AEW.

A sample of AEWs were requested to assess the adequacy and effectiveness not only of the trainings attended but also of the incentive received. Table 46 shows that the AEWs assessed the trainings conducted as adequate while the incentive provided was inadequate. Both trainings and incentives were found as effective hence the provision of which should be continued. If possible, additional incentive should be provided following some metrics/indicators of meritorious performance by the AEWs.

4.4.6.3 Status of the Digital Livestock Weighing Scale

The establishment of Livestock Auction Markets (LAMs) aimed to facilitate the selling of livestock following systematic procedures. One of the facilities provided in the operation of this infrastructure was digital livestock weighing scale. This aimed to correct the practice of pricing livestock based on ocular inspection, thus preventing farmers from being shortcharged in the sale of their animals.

Table 46. Adequacy and effectiveness of trainings on livestock production and incentives provided to Agricultural Extesion Workers

Variable	Adequacy		Effectiveness	
	Weighted Score	Remarks	Weighted Score	Remarks
Training on livestock production	2.90	Adequate	3.10	Effective
Provision of incentive	2.22	Inadequate	3.00	Effective

In 2015, three of the four heavy duty digital livestock weighing scales in Eastern Visayas were provided to LGUs in Samar Island. These were in Dolores and Salcedo in Eastern Samar and Calbayog City in Western Samar. However, during the period of assessment only the facility in Salcedo, Eastern Samar was functional.

A key informant interview with the market-in-charge in Salcedo, Eastern Samar revealed that the digital weighing scale has been very useful to the livestock raisers in the area. Before the installation of the weighing scale, most of the farmers were forced to sell their animals using ocular inspection to estimate weight. Given the system, farmers oftentimes felt that the weight of their animals has been underestimated, resulting to shortcharging them in the selling price of their livestock. Losses due to underestimation of weight of animals depended on the livestock species. Higher losses may have been incurred with large ruminants like carabao and cattle compared to smaller livestock species like goats and hogs.

With the availability of functional digital livestock weighing scale, weight determination was more accurate and farmers in Salcedo received fair payment for their animals. On average, the facility accommodated the weighing of 35 heads of livestock for sale per month.

Similar to Salcedo, the facility in Dolores, Eastern Samar was also utilized for the purpose and provided benefits to the intended clients. However, it was only functional for about a year. The facility was damaged when the slaughter house was renovated. The LGU has contacted the supplier for possible repair of the unit but to no avail.

On the other hand, the weighing scale given to Calbayog City has never been used. The unit has not been calibrated and installed yet. The slaughter house that was constructed with support from both the LGU and the National Meat Inspection Service (NMIS) that was supposed to house the weighing scale has not been utilized after its establishment. Said facility was located about 9 km away from the City Veterinary Office (CVO). Aside from its far location, said facility did not have water and power supply. Hence, the LGU decided to construct another slaughter house. During the period of evaluation, the building has been completed. However, it has not yet started operating because the LGU is still in the process of procuring other needed equipment, facilities and fixtures. The digital weighing scale will become functional once the slaughter house becomes operational.

Given the above situations, the opportunity of the facilities in providing benefits to the intended clients has been delayed. This could have been avoided with proper and

timely monitoring of the status of the infrastructures and provision of alternative measures for their effective and efficient use.

4.5 Impacts of the Agri-Pinoy Livestock Program in Samar Island

Three dimensions of impact of the A-PLP were considered in the assessment. These included economic, social and environmental impacts which were assessed using both quantitative and qualitative approaches. These impacts were determined through assessment of the following program components: UNAIP, SAIS RED project and AIRP. The quantitative evaluation primarily employed propensity score matching (PSM) and difference-in-difference (DID) method. Meanwhile, the qualitative indicators were determined by analyzing the MSC stories narrated by the project beneficiaries.

4.5.1 Economic Impact

The major economic impact of the A-PLP considered in the evaluation was farm income. PSM and DID methods were used to evaluate the economic impact between beneficiaries and non-beneficiaries. In addition, PSM was used to determine the program's impact on number of animals raised, mortality and morbidity of animals. T-test was likewise employed to determine statistical difference on income of beneficiaries *before* and *after* the AIRP.

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 A-PLP component projects in Samar Island. On the other hand, the control group involves the randomly selected non-beneficiary households across 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 A-PLP 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 carried out. This was done with the UNAIP and SAIS RED project. Table 47 shows the descriptive statistics of the surveyed respondents for UNAIP. It outlines the similarities and differences between the treated (those successful with AI in carabaos) and the control group (non-beneficiaries and those not successful with AI). The total number of sample respondents for the treated and control groups were 67 and 185, respectively.

Table 47. Summary statistics of the socio-demographic characteristics of the Treated and Control Groups of UNAIP respondents in Samar Island, 2018

Variable	Treated (n = 67)	Control (n = 185)	t	p>t
Age of household head	53.50	54.38	-0.53	0.597
Male household head	0.96	0.94	0.59	0.553
Married household head	0.90	0.91	-0.44	0.663
Education household head	7.13	6.90	0.43	0.666
Education spouse	7.96	7.81	0.34	0.736
Household size	4.73	4.61	0.43	0.665
Distance to water source	3.50	10.16	-2.83**	0.012
Farm to market distance	4.17	6.92	-1.94*	0.054
Years in carabao raising	17.39	15.37	1.09	0.278
Farm size	3.05	2.77	0.46	0.649
Farm ownership	0.46	0.50	-0.56	0.576
Membership in organization	0.54	0.52	0.18	0.856
Household durable assets	0.27	0.24	1.67*	0.097
Agricultural assets	0.05	0.02	2.46**	0.015

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

The average age of the household head for the treated group was 53.50 years old while the average age for the control group was 54.38 years old. Both the treated and control groups were mostly headed by males who were married. The average years of education of the household head in the treated group was 7.13 years while that for the control group was 6.90 years. On average, the years of education of spouse was relatively higher compared to the household head. Households for both the treated and control groups were composed of around five members.

The distance of households to the nearest water source differed by groups. For the treated group, the distance of water source from their household was around 3.5 km while for the control group the average distance of water source was around 10 km. In terms of farm to market distance, the treated group was located around 4.17 km away from their primary market while the control group was relatively far from the market with an estimated farm to market distance of around 7 km. Proximity to market brings some advantages to growers or carabao raisers. Farmers nearer the market can easily access marketing-related information and incur lesser transport cost.

In terms of experience, farmers in Samar Island have been involved in livestock raising for more than 15 years. The farmers in the treated group reported that they have been rasing livestock especially carabao for around 17 years while those in the control group indicated that they have been into livestock raising for around 15 years. The farmer-respondents in the treated group had an average farm size of 3.05 ha while those in the control group cultivated 2.77 ha. More than 40% of those in the treated group indicated that they owned the land they were tilling while around 50% of those in the control group indicated that they owned the land. Others leased or rented the land they cultivated.

In terms of asset ownership, an index was computed aggregating different assets (from farm tools, agricultural assets to housing appliances) owned by the respondents. 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 implies asset-rich households while an index closer to 0 signifies asset-poor households. The asset was divided into two groups: (i) household durable assets and (ii) agricultural assets. The household durable goods reflect appliances, structure of the house and other asset household goods while the agricultural assets refer to the properties or goods which are mainly used in farming or livestock raising. Results show that the treated group had relatively higher asset index for both household and agricultural assets compared to the control group. Table 47 shows that the average household durable asset index for the treated group is around 0.27 while for the control group is around 0.24. For agricultural assets, the average index for the treated group and control group is around 0.05 and 0.02, respectively.

Meanwhile, Table 48 shows the descriptive statistics of the surveyed respondents for the SAIS RED project. It outlines the similarities and differences between the treated or beneficiaries of the SAIS RED project compared with the control or non-beneficiaries. The total number of samples for the treated and control groups are 58 and 59, respectively. Based on the socio-demographic comparison between the treated and control groups, only two variables showed significant differences: (i) years in goat raising and (ii) distance of farm to water source. The treated group had relatively higher experience in goat raising (10.52 years) compared to the control group (6.27 years). Moreover, the distance of household of the beneficiaries to the nearest water source was around 1.06 km while for the non-beneficiaries the average distance was around half a kilometer. For other socio-demographic characteristics, the treated and control groups showed no significant statistical differences.

The average age of the household head for the treated group was 56 years old while the average age for the control group was 53 years old. Both the treated and control groups were mostly headed by male, around 90% of whom were married. The average years of education for the household in the treated group was 10.09 years and 9.76 years for the control group. On average, the years of education of spouse was relatively higher compared to the household head. Household size for both the treated and control groups was around four members. In terms of farm to market distance, the treated group was located around 6.5 km away from their primary market while the control group was around 6 km. Proximity to market brings some advantages to goat raisers since they can easily access information related to marketing and with lesser transport cost.

Table 48. Summary statistics of the socio-demographic characteristics of the Treated and Control Groups of SAIS RED respondents in Samar Island, 2018

Variable	Treated (n = 58)	Control (n = 59)	t	p>t
Age of household head	55.85	53.10	1.23	0.223
Education household head	10.09	9.76	0.50	0.619
Household size	4.21	4.39	-0.50	0.615
Married status	0.91	0.90	0.28	0.776
Male household head	0.83	0.73	1.28	0.202
Education of spouse	10.22	10.12	0.15	0.879
Age of spouse	52.49	51.06	0.59	0.556
Farm to market distance	6.49	5.95	0.46	0.649
Years in goat raising	10.52	6.27	2.74***	0.007
Farm size	8.79	3.69	1.34	0.182
Farm ownership	0.60	0.71	-1.23	0.220
Membership in organization	0.48	0.51	-0.28	0.783
Household asset	10.41	10.63	-0.63	0.532
Distance to water source	1.06	0.48	1.63*	0.105

Note: *** p<0.01

For goat raising experience, the treated group reported that they have been raising goats for 10.5 years while the control group indicated that they have been into goat raising for 6.3 years. The farmer-respondents in the treated group had an average farm size of 8.79 ha while those in the control group had 3.69 ha. Around 60% and 71% of the treated group and contro group, respectively, indicated that they owned the land they were tilling. Around half of the goat raisers indicated they were members in an organization. In terms of household asset, the log of household asset is around 10.41 for the treated and 10.63 for the control group.

The initial comparison using the parametric t-test for independent groups shows that there are inherent differences in the socio-economic characteristics between the treated and control groups. Tables 47 and 48 show that the two groups from UNAIP and SAIS RED project differ significantly in some observable characteristics. In particular, respondents for UNAIP differ in terms of distance to water source, farm to market distance, household durable asset, and agricultural assets. Meanwhile, the respondents of the SAIS RED project differ significantly in terms of years in goat raising and distance to water source. On the other hand, t-values that were not significant indicated 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 Tables 47 and 48, there were significant and inherent differences between households in the treated and control groups. Immediately comparing outcome variables using the data from Tables 47 and 48 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 or counterfactual using the propensity score matching technique. Hence, to reduce the differences on observable characteristics observed in Tables 47 and 48, 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. Tables 49 and 50 present the results of logit regression in estimating the propensity score of the respondents for the UNAIP and SAIS RED project, respectively, 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

Table 49. Logit regression in estimating the propensity score with receiving the treatment as the dependent variable for UNAIP

Variables	Coefficients	Std. Err.
Age of household head	-0.017	0.0170
Male household head	0.298	1.1655
Married household head	-0.343	1.2555
Education household head	0.062	0.0589
Education spouse	-0.078	0.0734
Household size	-0.027	0.0869
Distance to water source	-0.033**	0.0164
Years into carabao raising	0.021	0.0133
Farm size	0.012	0.0642
Farm ownership	-0.223	0.3414
Farm to market distance	-0.093**	0.0458
Membership in organization	-0.131	0.3340
Household durable assets	1.962	1.8042
Agricultural assets	6.370	5.4183
Constant	0.102	2.0233
Observations	213	
Pseudo R-square	0.0949	

Note: ** $p<0.05$
Log likelihood = -113.75695, LR chi2(14) = 23.97, Prob > chi2 = 0.0949

Results highlight several characteristics that appear to be significant predictors of being randomly chosen as a beneficiary of the UNAIP. The significant variables include distance to water source and farm to market distance. For SAIS RED project, there are three variables that significantly influence the probability of being chosen as a beneficiary. These are education of both the household head and spouse and distance to water source. Results of logit estimation presented in Tables 49 and 50 were used in estimating the propensity score between the beneficiary and non-beneficiary farmers.

Table 50. Logit Regression in estimating the propensity score with receiving the treatment as the dependent variable for the SAIS RED project

Variables	Coefficients	Std. Err.
Age of household head	0.030	0.0612
Education household head	0.311**	0.1241
Household size	-0.045	0.1308
Married status	0.427	1.3917
Male household head	0.739	0.7184
Education of spouse	-0.199*	0.1167
Age of spouse	0.014	0.0562
Farm to market distance	0.016	0.0434
Years in goat raising	0.044	0.0355
Farm size	0.053	0.0686
Farm ownership	-0.891	0.5708
Membership in organization	-0.311	0.5278
Household asset	-0.133	0.1608
Distance to water source	0.246*	0.1380
Constant	-3.052	2.556
Observations	91	
Pseudo R-square	0.1866	

Note: ** p<0.05, * p<0.1,
Log likelihood = -51.302831 , LR chi2(14) = 23.54, Prob > chi2 = 0.0521

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.

Tables 51 and 52 show the the balancing of covariates after conducting nearest neighbour matching. They indicate 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, Tables 47 and 48 show 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, Tables 49 and 50 report that there were 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 for UNAIP show that the sample for the beneficiary is 67 and the non-beneficiary is 185 respondents. After matching, the number of respondents from the beneficiary group is reduced to 55 respondents and the number of respondents for the non-beneficiary group was only 137. On the other hand, the raw data for the SAIS RED project show that the sample for the beneficiary group is 58 and the non-beneficiary group is 59 respondents. After matching, the number of respondents from the beneficiary group is reduced to 33 respondents and the number of respondents for the non-beenficiary group was only 46. 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 51. Balancing of covariates after matching the UNAIP respondents

Variable	Treated (n = 55)	Control (n = 137)	t	p>t
Age of household head	53.84	54.97	-0.51	0.608
Male household head	0.98	0.98	0.00	1.000
Married household head	0.98	0.96	0.58	0.563
Education household head	7.14	7.00	0.21	0.836
Education spouse	7.75	7.72	0.06	0.951
Household size	4.93	4.58	0.93	0.355
Distance to water source	196.67	299.41	-0.32	0.746
Farm to market distance	4.29	4.42	-0.17	0.863
Years into carabao raising	17.74	20.37	-0.96	0.337
Farm size	2.62	2.82	-0.36	0.717
Farm ownership	0.44	0.35	0.95	0.342
Membership in organization	0.54	0.60	-0.56	0.574
Household durable assets	0.25	0.23	1.13	0.263
Agricultural assets	0.03	0.03	-0.14	0.889

Table 52. Balancing of covariates after matching the respondents of the SAIS RED project

Variable	Treated (n = 33)	Control (n = 46)	t	p>t
Age of household head	54.30	52.49	0.73	0.469
Education household head	10.58	11.27	-0.93	0.357
Household size	4.45	4.48	-0.07	0.940
Married status	0.97	0.97	0.00	1.000
Male household head	0.88	0.82	0.68	0.500
Education of spouse	10.73	11.27	-0.70	0.489
Age of spouse	51.33	48.64	0.89	0.377
Farm to market distance	5.87	5.49	0.32	0.748
Years in goat raising	7.00	6.68	0.25	0.805
Farm size	4.29	3.62	0.67	0.507
Farm ownership	0.67	0.70	-0.26	0.795
Membership in organization	0.52	0.64	-0.99	0.327
Household asset	10.69	10.94	-0.57	0.574
Distance to water source	0.92	1.64	-1.24	0.221

Figures 26 and 27 show the distribution of propensity scores among benefiary and non-beneficiary households with common support imposed. They present 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 Tables 51 and 52 showing that households in both groups were balanced in terms of their observed characteristics. In addition to Figures 26 and 27, Figures 28 and 29 show the changes in propensity scores *before* and *after* matching. *Before* matching the densities of beneficiary and 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.

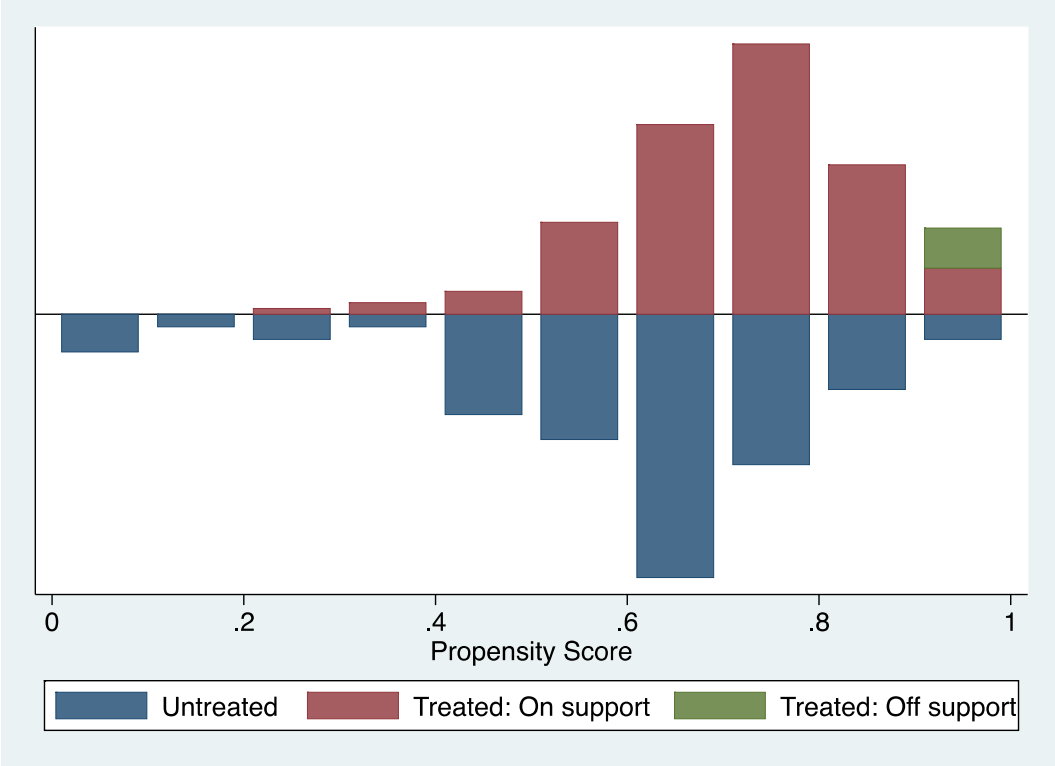


Figure 26. Propensity scores of the treated and control UNAIP households with common support imposed

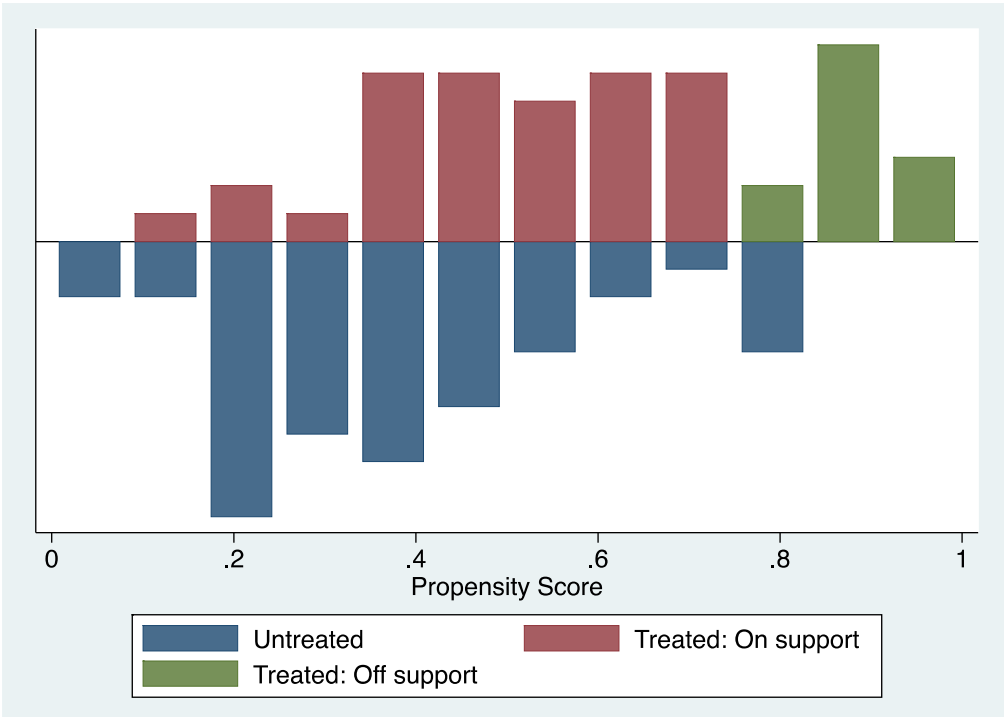


Figure 27. Propensity scores of the treated and control SAIS RED households with common support imposed

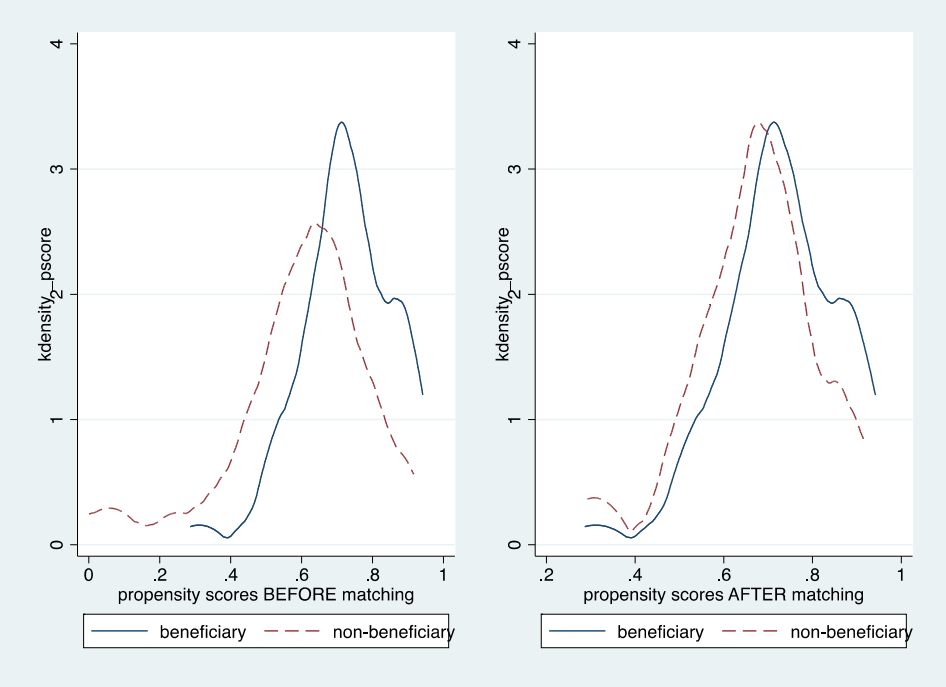


Figure 28. The density of propensity scores *before* and *after* matching the UNAIP respondents

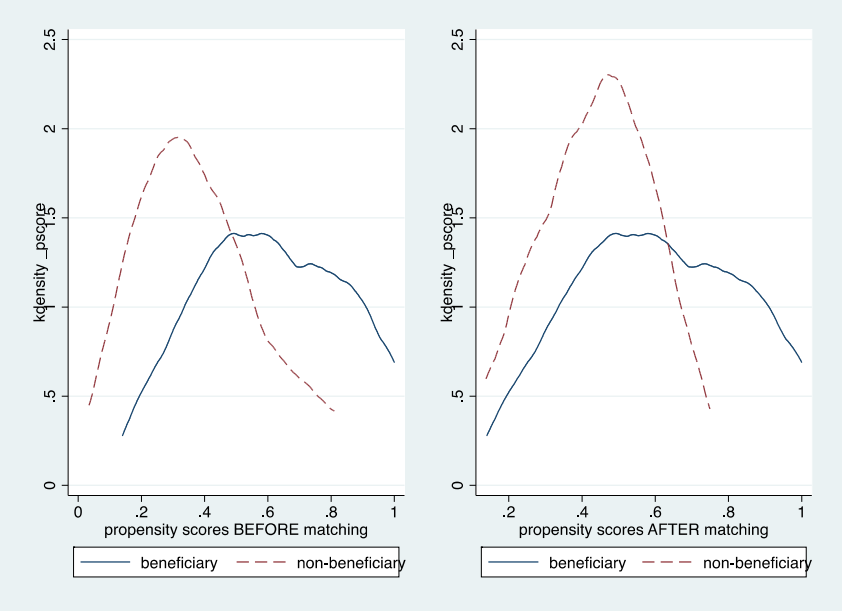


Figure 29. The density of propensity scores *before* and *after* matching the SAIS RED project respondents

After estimating the propensity score, imposing common support region and ensuring that the balancing property was satisfied. The impact of UNAIP and SAIS RED project in Samar Island 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 beenficiary and their matched comparison captured the estimated impact of UNAIP and SAIS RED project. In summary, the program's impact was derived by comparing the average outcomes (number of heads of animals, net income, morbidity and mortality rate) among the statistically matched subgroup of households using observable characteristics. The propensity score matching estimator for ATT is 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:

$$\partial_{ATT} = E\ [\{E[Y_1 \mid P(X_i), T_i = 1] - E[Y_0 \mid P(X_i), T_i = 0]\} \mid T_i = 1] \quad (9)$$

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 of the Unified Artificial Insemination Program on Carabao Production

4.5.1.3.1 Impact of UNAIP on Income of Carabao Raisers

Table 53 shows the results of impact estimate or average treatment effect on the treated (ATT) using the three commonly used matching techniques: k-nearest neighbour, radius matching and kernel matching. The impact variable is net income per animal (accounting all costs including implicit costs of households such as family labor). The net income for carabao raisers who were successful in artificial insemination were divided by the total number of carabo heads to get an estimate of net income per capita. Similarly, the net income of farmers who were not successful with artificial insemination together with the non-beneficiary group was collected to serve as a comparison.

A positive ATT value is interpreted as a positive impact of the UNAIP to the net income of carabao raisers obtained not only from the draft and sale of animals but also from milk and cheese. Results show that the net income of carabo raisers who were successful in the artificial insemination were relatively higher than the control group. The ATT result is robust across several matching techniques. This implies that there is consistent positive significant impact on carabao production. For the nearest neighbour matching, the estimated increase in net income, on average, is PhP11,084 per carabao head while for the kernel matching, the estimated increase in net income is around PhP11,823. On the other hand, the radius matching shows an increase in estimated net income of around PhP11,917 per carabao head. This increase in income is attributed to the successful implementation of artificial insemination. The estimated impact is significant across several matching techniques. The estimated increase in net income is behaving similarly across the three matching techniques suggesting consistent positive impact when farmers are successful with artificial insemination in carabao.

Table 53. Impact of the Unified Artificial Insemination Program on net income (in PhP) of carabao raisers (successful in artificial insemination compared with not successful and non-beneficiary) using matching estimates in Samar Island

Net Income	Nearest Neighbour	Kernel Matching	Radius Matching
Treated (PhP)	19,497.35	19,497.35	19,497.35
Control (PhP)	8,413.33	7,674.25	7,580.16
Impact estimate ATT (PhP)	11,084.02*	11,823.11**	11,917.20***
Bootstrap SE[§]	6,638.88	5,596.18	3,453.30
z	1.67	2.11	3.45
P>|z|	0.10	0.04	0.00
Treated (n)	55	55	55
Control (n)	137	137	137

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

This result is supported by the stories of most significant change narrated by the AI beneficiaries. They claimed that AI resulted to better quality offsprings that grow faster and produce more milk. As one storyteller from Western Samar said: *"It's good because now I am not only taking care of native carabaos; I already have crossbreeds now… I can sell them at a higher price because they are bigger.*" Another beneficiary from the same province pointed out the capability of the crossbreeds to produce more milk *stating "The carabao offspring conceived through AI produces more milk so it is important for us because it was able to help us… it was able to help me and in sending my grandchildren to school."* They claimed that the AI technology provided them additional livelihood through the production of milk and/ or white cheese and more income from the crossbred carabaos. For example, one beneficiary from Gandara, Western stated that *"It's good because I am already into milk production and I already have a buffalo carabao… I have already sold milk."* Moreover, a lady beneficiary from the same municipality narrated that *"We were able to produce white cheese because of the carabao and we were able to own buffalo… we were able to earn income from white cheese so we were able to provide daily allowance to our school children and have money for our daily household expenses."* For his part, a beneficiary from Las Navas, Northern Samar narrated that *"AI had a good result. Our income increased because we could sell the carabao offspring coming from AI at a higher price since it is bigger. It [the change] is important because it has helped us a lot."* Aside from using the additional income for the education of children and grandchildren, the beneficiaries were also able to buy farm implements like tractor and thresher as well as motorcycle from the sale of crossbred carabaos.

Table 53 takes into account the implicit cost such as family labor and other services extended by the LGU technician. When these implicit costs were not included, Table 54 shows that the estimated effect on income above implicit costs is even higher at around PhP13,000 per carabao head. Similar to net income, this estimated increase in income above implicit costs is significant across matching techniques suggesting that there is strong statistical evidence on the benefit of artificial insemination on carabao raisers' income.

The program effect was determined by comparing the net income between UNAIP beneficiaries and non-beneficiaries. Out of 132 beneficiaries and 120 non-beneficiary respondents, only 93 beneficiaries and 97 non-beneficiaries were included in the analysis using propensity score matching. The other samples were dropped because of unmatched household characteristics. Figure 30 shows the propensity score comparison *before* and *after* matching. *Before* matching, there was clear difference in the distribution between beneficiary and non-beneficiary. After matching, the distribution of the beneficiary group was almost similar to the non-beneficiary group.

Table 54. Impact of the Unified Artificial Insemination Program on income above implicit costs (in PhP) of carabao raisers (successful in artificial insemination compared with not successful and non-beneficiary) using matching estimates in Samar Island

Income Above Implicit Costs (PhP/animal)	Nearest Neighbour	Kernel Matching	Radius Matching
Treated (PhP)	44,423.86	44,423.86	44,423.86
Control (PhP)	31,587.52	32,057.54	31,689.83
Impact estimate ATT (PhP)	12,836.33*	12,366.32**	12,734.03***
Bootstrap SE[§]	6,889.01	4,987.54	4,147.97
z	1.86	2.48	3.07
P>|z|	0.06	0.01	0.00
Treated (n)	55	55	55
Control (n)	137	137	137

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

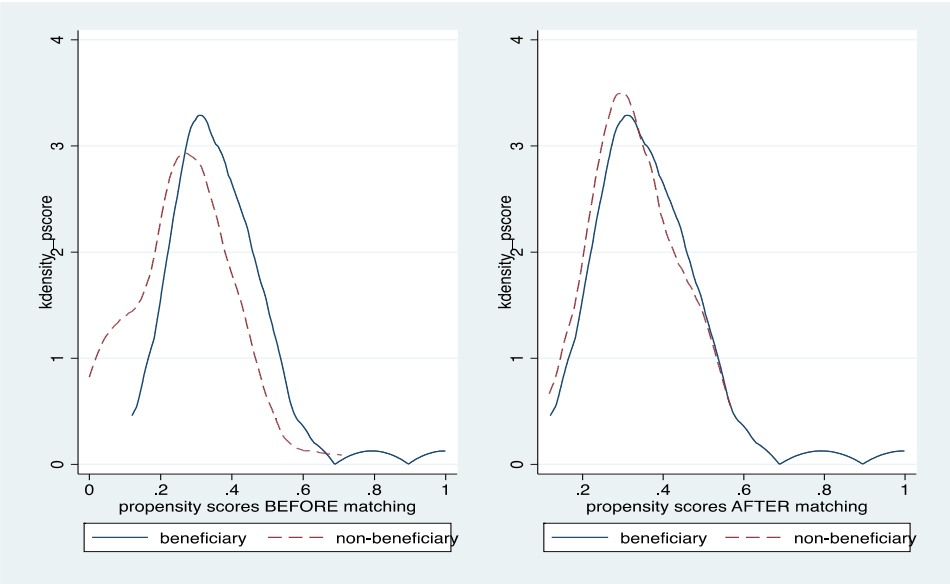


Figure 30. The density of propensity scores of the UNAIP beneficiary and non-beneficiary *before* and *after* matching

Comparing the outcomes of the beneficiary and non-beneficiary group measured in terms of net income per carabao head estimated the program effect. Results show that average treatment effect (ATT) is positive ranging from PhP4,400 to PhP6,400 (Table 55) but the estimated increase in income is not statistically significant. Though not statistically significant, on average, being a beneficiary of the program resulted to a marginal increase in income. The statistically insignificant results can be attributed to the fact that half of the randomly selected beneficiary group were not successful in the conduct of artificial insemination. It is apparent that there is a need to increase the success rate of artificial insemination as it is directly associated with increase in income. Government programs should continually enhance the conduct of artificial insemination aiming for increase in success rate. Nevertheless, the positive estimate of ATT maybe not be statistically significant but it is, on average, economically significant.

Table 55. Impact of the Unified Artificial Insemination Program on net income between beneficiaries and non-beneficiaries using matching estimates in Samar Island

Net Income (PhP/animal)	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiary (PhP)	14,414.72	14,414.72	14,414.72
Non-Beneficiary (PhP)	10,004.07	9,349.07	8,007.34
Impact estimate ATT (PhP)	4,410.64	5,065.64	6,407.38
Bootstrap SE[§]	7,336.68	4,978.34	4,536.04
z	0.60	1.02	1.41
P>|z|	0.548	0.31	0.16
Treated (n)	93	93	93
Control (n)	97	97	97

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

Now focusing only among the beneficiary group and comparing the outcomes of the successful and not successful beneficiary of the UNAIP, Table 56 shows mixed results. The kernel and radius matching indicate significant positive impact with similar values but nearest neighbour shows insignificant yet positive results. The ATT estimate for the nearest neighbour is relatively lower than the kernel and radius matching. The estimated impact from nearest neighbour is PhP5,266 while for the kernel matching, the estimated increase in net income is PhP14,076 and for the radius matching, the estimated increase in income for those successful in AI compared to those not successful is PhP13,476. Table 56 further shows that kernel and radius matching are almost similar in estimated impact while the nearest neighbour is relatively lower. The differences in results can be attributed to a very small sample size used in the analysis. The PSM works better with bigger sample size. It is a data intensive empirical method but nevertheless, results in Table 56 suggest that successful AI results to an increase in net income ranging from PhP13,400 to PhP14,000 per animal. However, caution must be taken as this estimated value comes from a small sample size.

Table 56. Impact of the Unified Artificial Insemination Program on net income (PhP/animal) of beneficiaries using matching estimates in Samar Island

Net Income	Nearest Neighbour	Kernel Matching	Radius Matching
Successful AI (PhP)	20,019.90	20,019.90	20,019.90
Not successful AI (PhP)	14,753.46	5,944.16	6,544.24
ATT (Php/hectare)	5,266.44	14,075.74*	13,475.66**
Bootstrap SE[§]	8,601.16	8,068.31	6,390.60
z	0.61	1.74	2.11
P>|z|	0.54	0.08	0.04
Beneficiary (n)	40	40	40
Non-beneficiary (n)	54	54	54

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

4.5.1.3.2 Impact of UNAIP on Income of Carabao Raisers by Income Group

To further evaluate the estimated impact of UNAIP, the sample farmer respondents were stratified by income groups. Households were divided into two groups: (i) households 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 Samar Island 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.

By stratifying the analysis by income group, variations between rich and poor households were homogenized. Table 57 shows that out of 252 respondents, 207 were classified as poor while 45 respondents were categorized as non-poor. With limited respondents, fewer matched households using propensity score matching was anticipated.

Table 57. Stratification of respondents by income group in Samar Island

Type of Respondent	Below Poverty Line		Above Poverty Line	
	No.	%	No.	%
UNAIP beneficiary	103	49.76	29	64.44
Non-beneficiary	104	50.24	16	35.56
Total	207	100	45	100

For the analysis below the poverty line, Table 58 shows that there is a considerable decrease in the number of households that were matched. Only 72 households for the beneficiary group and 81 households for the non-beneficiary below poverty line were included in the analysis. Nevertheless, the stratification of the sample size allowed further examination to whom impact was felt most. Results show that on

average' the impact of UNAIP on the net income of farmers is positive. The net income of beneficiaries who were below the poverty line was relatively higher compared to the non-beneficiaries. However, the estimated impact is not statistically significant. The positive estimate of ATT ranging from PhP1,500 to PhP2,500 is a promising indicator of income increase among poor farmers (Table 58).

Table 58. Impact of the Unified Artificial Insemination Program on net income (PhP/animal) of carabao raisers below the poverty line in Samar Island

Net Income	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiary (PhP)	9,122.46	9,122.46	9,122.46
Non-beneficiary (PhP)	6,551.18	7,608.22	6,578.19
ATT (PhP)	2,571.28	1,514.24	2,544.27
Bootstrap SE[§]	7,555.04	4,276.53	3,831.28
z	0.34	0.35	0.66
P>|z|	0.73	0.72	0.50
Beneficiary (n)	72	72	72
Non-beneficiary (n)	81	81	81

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

When comparing the net income of farmers who were successful in the artificial insemination compared to those who were not successful and non-beneficiary group, the ATT estimate or the difference in income ranged from PhP3,400 to PhP6,900 (Table 59). This is relatively higher compared to the program effect with an estimate of ATT ranging only from PhP1,500 to PhP2,500 (Table 58). Although Table 59 shows relatively higher impact in terms of net income per farmer, the result is somehow not robust across different matching techniques. It is only radius matching which showed that the impact of UNAIP among poor farmers is statistically significant.

4.5.1.3.3 Impact of UNAIP on the Productivity of Carabaos

Table 60 presents the comparison of animal production between the treated group (successful UNAIP beneficiary) and the control group (unsuccessful UNAIP beneficiary and non-beneficiary). Results show that there is no difference in the number of heads produced between the treated and control group. This suggests that carabao production between the treated and control group is relatively similar. The ATT estimate is very negligible because the average heads produced by the treated group is two (2) carabao heads. This is the same production output with the control group. The raisers in the control group were not able to produce carabao through artificial insemination but were still able to produce through their natural practice. In essence, the treated group and control group were able to produce the same number of carabao heads but those produced through artificial insemination has higher market value. As highlighted in the previous findings, successful artificial insemination resulted to positive increase in net income. In addition, Figure 31 shows the change in the distribution of propensity scores *before* and

after matching. *After* matching, the distributions of scores of the treated and control groups were almost similar suggesting that they were comparable.

Table 59. Impact of the Unified Artificial Insemination Program on net income (PhP/animal) of carabao raisers (successful in artificial insemination compared with not successful and non-beneficiary) below the poverty line in Samar Island

Net Income	Nearest Neighbour	Kernel Matching	Radius Matching
Successful AI (PhP)	12,853.48	12,853.48	12,853.48
Control group (PhP)	9,448.18	6,627.72	5,878.63
ATT (PhP/ha)	3,405.29	6,225.76	6,974.85*
Bootstrap SE§	8,031.95	4,931.68	3,679.50
z	0.42	1.26	1.90
P>|z|	0.67	0.20	0.058
Beneficiary (n)	39	39	39
Non-beneficiary (n)	116	116	116

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

Table 60. Impact of the Unified Artificial Insemination Program on the productivity of carabao (number of heads) between the treated group (successful in artificial insemination) and control group (not successful and non-beneficiary) in Samar Island

Number of Carabaos	Nearest Neighbour	Kernel Matching	Radius Matching
Successful AI (no. of heads)	2.07	2.07	2.07
Control group (no. of heads)	2.07	2.19	2.05
ATT (no. of heads)	0.00	-0.12	0.02
Bootstrap SE§	0.60	0.45	0.31
z	0.00	-0.27	0.08
P>|z|	1.00	0.78	0.94
Beneficiary (n)	57	57	57
Non-beneficiary (n)	154	154	154

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

4.5.1.3.4 Impact of UNAIP on the Mortality and Morbidity of Carabaos

Another outcome of interest is the mortality rate. This measures the incidence of death of carabaos over the total number of carabao heads maintained by the farmers. Table 61 shows that the treated group has lower mortality rate compared to the control group. The estimated impact using average treatment effect of the treated shows significant negative mortality rate. This result implies that beneficiaries of UNAIP who

were successful in AI experienced lower mortality rate compared to the non-successful and non-beneficiaries.

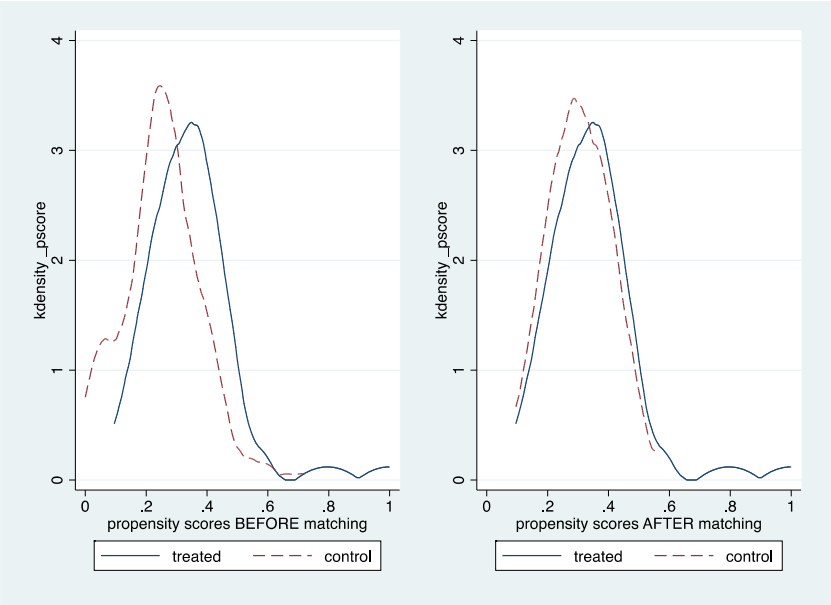


Figure 31. The distribution of propensity score of the control and treated *before* and *after* matching

Table 61. Impact of the Unified Artificial Insemination Program on the mortality rate (%) of carabao between the treated group (successful in artificial insemination) and control group (not successful and non-beneficiary) in Samar Island

Mortality Rate (%)	Nearest Neighbour	Kernel Matching	Radius Matching
Successful AI (%)	1.52	1.52	1.52
Control group (%)	7.27	7.88	6.08
ATT (%)	-5.76	-6.36*	-4.57**
Bootstrap SE[§]	5.07	3.64	2.26
z	-1.14	-1.75	-2.02
P>|z|	0.26	0.08	0.04
Beneficiary (n)	55	55	55
Non-beneficiary (n)	134	134	134

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

In terms of morbidity rate or the incidence of diseases, the treated group has lower morbidity rate compared to the control group (Table 62). Results suggest that UNAIP was able to help reduce the mortality and morbidity rates in carabao production in Samar island. The analysis shows that across matching estimates there is a reduction in both mortality and morbidity rates between the treated group and the control group. However,

significant reduction can only be seen from the kernel matching and radius matching. The nearest neighbour matching method indicated reduction in the mortality and morbidity rates but the estimated reduction is not statistically significant.

Table 62. Impact of the Unified Artificial Insemination Program on the morbidity rate (%) of carabao between the treated group (successful in artificial insemination) and control group (not successful and non-beneficiary) in Samar Island

Morbidity Rate (%)	Nearest Neighbour	Kernel Matching	Radius Matching
Successful AI (%)	0.00	0.00	0.00
Control group (%)	5.88	6.62	4.79
ATT (%)	-5.88	-6.62**	-4.79***
Bootstrap SE[§]	4.77	2.80	1.54
z	-1.23	-2.36	-3.10
P>|z|	0.22	0.02	0.00
Beneficiary (n)	55	55	55
Non-beneficiary (n)	133	133	133

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

4.5.1.4 Difference-in-Difference Analysis in Estimating Impact of the Unified Artificial Insemination Program on Net Income

In the presence of good baseline data, difference-in-difference (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 information *before* A-PLP–UNAIP 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 UNAIP on the net income of carabao raisers. Table 63 shows the regression results using the DID approach. The first model is an algebraic estimation of impact without controlling for household characteristics. Model 2 improves on the first model by including the characteristics of household head and its spouse. Model 3 incorporates the information of both the household head and spouse together with farming related variables. Evaluating the impact using the method of DID with several regression models helps in checking the robustness of the estimation. Ideally, it would be good to include several control variables that are time varying to control for changes that may have occurred simply because of time. The practices, aspirations and performance of farmers change with time.

For Table 63, the dependent variable is the net income per carabao head. The main variable depicting the estimated impact across time and type of respondents is the difference-in-difference variable. This variable was estimated by getting the interaction effect with time and type of respondents. The time variable is year and is dummy variable reflecting 1 *after* UNAIP and 0 representing conditions *before* UNAIP. The type of

respondents is represented by treatment variable. Treatment is also a dummy reflecting 1 for the beneficiaries who were successful with artificial insemination under the UNAIP and 0 for those who were not successful with AI and also including the randomly selected non-beneficiary group of farmers.

Results show that consistent with the methods of propensity score matching, the DID reported positive impact on the net income of farmers. The highest impact is presented by model with an estimated change in net income by PhP14,787. However, as more variables were added the estimated magnitude of impact decreases marginally. The decline is due to the inclusion of new variables that control for observable characteristics.

Table 63. Estimation of impact of the Unified Artificial Insemination Program on net income of carabao raisers in Samar Island using difference-in-difference approach

Variable	Model1	Model 2	Model 3
Difference-in-difference	14,787**	13,113*	12,318*
	(6,943)	(7,356)	(7,413)
Year	-15,111***	-15,024***	-14,542***
	(4,362)	(4,725)	(4,805)
Treatment	-904.2	-1,627	-841.7
	(5,482)	(5,854)	(5,936)
Age of household head		-91.97	-150.6
		(157.7)	(162.8)
Education of household head		890.1	773.2
		(596.5)	(605.1)
Married status of head		-5,681	-6,258
		(10,419)	(10,446)
Education of spouse		-30.73	-66.39
		(682.0)	(698.4)
Household size			-966.9
			(881.4)
Distance from water source			124.1
			(155.0)
Number of carabaos			535.6*
			(310.2)
Constant	23,095***	27,720*	34,425**
	(3,735)	(14,976)	(16,699)
Observations	341	298	294
R-squared	0.059	0.066	0.081

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

4.5.1.5 Estimating Effect of the Samar Island Small Ruminant Rural Enterprise Development Project

The implementation of the SAIS RED project was completed in December 2017 hence only its possible immediate effects are discussed. These include effects on the quantity of goats raised and income between beneficiaries and non-beneficiaries.

4.5.1.5.1 Effect of SAIS RED Project on the Quantity of Goats Raised

Table 64 presents the impact of SAIS RED project on the quantity of goats raised by farmers. Farmer beneficiaries raised an average of nine goats while non-beneficiaries raised around five goats. Results of the propensity score matching method suggest that the project has significantly increased the number of heads of goat raised by four (4) (p-values<0.05). This result is consistent across the three matching methods (nearest neighbour, kernel and radius matching).

Table 64. Impact of the Samar Island Small Ruminant Rural Enterprise Development Project on the production of goats in Samar Island

Number of Goats Produced	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiary (no. of goats)	8.61	8.61	8.61
Non-beneficiary (no. of goats)	4.33	4.56	5.09
ATT (no. of goats)	4.27**	4.05**	3.52**
Bootstrap SE[§]	1.88	1.82	1.58
z	2.27	2.23	2.23
P>|z|	0.023	0.026	0.026
Beneficiary (n)	33	33	33
Non-beneficiary (n)	46	46	46

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

4.5.1.5.2 Effect of SAIS RED Project on Net Income of Goat Raisers

Considering the analysis with only those respondents who matched, Table 65 shows that goat raising in Samar Island was not profitable with the non-beneficiaries incurring more losses than the beneficiaries. Farmer beneficiaries incurred around PhP9,000 while non-beneficiaries incurred between PhP10,000 to PhP13,000 losses per farm. This resulted in the positive value of the ATT indicating a net income per farm from about PhP600.00 to PhP3,000.00. This implies that the SAIS RED project has enabled an increase in net income from goat raising, only that the impact estimate was not statistically significant.

Despite the lack of statistical significance on the difference of net income derived from goat raising between beneficiaries and non-beneficiaries, some beneficiaries revealed that they generated additional income from raising crossbred goats. One beneficiary from Llorente, Eastern Samar narrated *"I was able to produce more milk from my crossbred goats. Before, my native goats were only able to produce less volume of milk that is why I was not able to sell milk in the Poblacion. When the goat from SAIS*

RED delivered its offspring, it was able to produce more milk, so my income increased." Another beneficiay from San Roque, Northern Samar shared *"The number of our goats increased and we were able to have more income…. it's what I have observed since we were able to have a crossbred goat. It was able to deliver offsprings which we were able to sell at higher price than the native goats. A native goat weighing 20 kg could be sold at PhP2,000.00 only, while a 20 kg crossbred goat could be sold at PhP5,000.00 to PhP6,000.00."*

Table 65. Impact of SAIS Red on net income on goat production per farm in Samar Island

Net income	Nearest neighbour	Kernel matching	Radius matching
Beneficiary (Php)	-9,377.45	-9,377.45	-9,377.45
Non-beneficiary (Php)	-12,663.59	-9,946.78	-10,255.02
Impact estimate ATT	3,286.14	569.33	877.58
Bootstrap SE[§]	18,724.60	14,982.24	10,788.81
z	0.18	0.04	0.08
P>|z|	0.861	0.970	0.935
Beneficiary (n)	33	33	33
Non-beneficiary (n)	46	46	46

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

When costs of family labor and other owned resources were exluded in the analysis, Table 66 shows positive income above implicit costs from goat raising. The beneficiaries had relatively higher income above implicit costs (PhP16,000.00 per farm) compared to the non-beneficiaries (PhP6,000.00 to PhP12,000.00). This resulted to the positive estimate of ATT. However, the estimated impact is still not statistically significant. Across matching methods, the impact estimate ranged from PhP4,000.00 to PhP10,000.00 per farm. Even if the estimated value is not statistically significant, the positive estimate of ATT is an initial indicator that the project was able to contribute positively to the outcomes. However, these results should be taken with caution.

4.5.1.5.3 Effect of SAIS RED Project on Mortality and Morbidity of Goats

The effect of SAIS RED project on the morbidity and mortality rates of goat production was also examined. Table 67 reflects that mortality rate of goats for farmer beneficiaries (11%) is less than that of non-beneficiaries (20% to 24%). The difference in mortality rates ranged from -9% to 12%. This implies that the project has reduced the mortality rate of goat production among farmer beneficiaries as compared to non-beneficiaries. However, the impact is not statistically significant. This could be because of the massive drop of sample size of only nine beneficiaries matched with 66 non-beneficiaries. With this number of matched respondents, the internal validity of the estimation results is not that strong. Propensity score matching method requires large sample sizes.

Table 66. Impact of SAIS Red on income above implicit costs of on goat raisers per farm in Samar Island

Net Income Above Implicit Cost	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiary (PhP)	16,229.55	16,229.55	16,229.55
Non-beneficiary (PhP)	5,985.23	11,019.42	11,868.82
Impact estimate ATT	10,244.32	5,210.13	4,360.73
Bootstrap SE[§]	15,210.93	10786.60	7,318.00
z	0.67	0.48	0.60
P>|z|	0.501	0.629	0.551
Beneficiary (n)	33	33	33
Non-beneficiary (n)	46	46	46

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

Table 67. Impact of the Samar Island Small Ruminant Rural Enterprise Development Project on mortality (%) of goats in Samar Island

Mortality Rate	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiary (%)	11.33	11.33	11.33
Non-beneficiary (%)	20.43	23.75	20.86
ATT (%)	-9.10	-12.41	-9.53
Bootstrap SE[§]	19.21	15.49	8.68
z	-0.47	-0.80	-1.10
P>|z|	0.636	0.423	0.272
Beneficiary (n)	9	9	9
Non-beneficiary (n)	66	66	66

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

Consequently, results of the PSM on the impact of SAIS RED on the morbidity rate of goat production generated mixed results. It shows that with the nearest neighbour and radius matching, morbidity rates of goats raised by non-beneficiaries (10.70% to 11.67%) are relatively higher than beneficiaries (10.24%) (Table 68). With kernel matching, it displays the opposite that goats raised by beneficiaries have higher morbidity rates than non-beneficiaries. With these results, ATT values across the three matching methods are not consistent and still not statistically significant. The results imply that morbidity and mortality rates of goat production among beneficiaries and non-beneficiaries are statistically the same. That is, there is no sufficient evidence to claim that the project has significantly reduced mortality and morbidity rates of goats.

Table 68. Impact of the Samar Island Small Ruminant Rural Enterprise Development Project on morbidity rate (%) of goats in Samar Island

Morbidity Rate	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiary (%)	10.24	10.24	10.24
Non-beneficiary (%)	11.67	8.46	10.70
ATT (%)	-1.43	1.78	-0.74
Bootstrap SE[§]	7.66	8.18	5.14
z	-0.19	0.22	-0.09
P>|z|	0.852	0.828	0.928
Beneficiary (n)	29	29	29
Non-beneficiary (n)	42	42	42

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

4.5.1.6 Estimating the Effect of the Animal Infusion and Restocking Program on Income of the Swine Growers

The effect of the AIRP on the income of swine raisers was determined using paired sample T-test given the limited number of respondents interviewed. Both the household income and income from swine enterprise were estimated *before* and *after* AIRP.

Table 69 shows that household income and income from swine production significantly increased after availment of the AIRP. On average, the swine growers generated a significantly higher income amounting to PhP11,000.00 from the infused animals. This contributed to about 69% in the increase of household income. This implies that the AIRP has been effective in increasing the income of swine raisers in Samar Island.

Table 69. Total household income and net income (in PhP) of swine raisers *before* and *after* Animal Infusion in Samar Island

Income	*Before* Animal Infusion	*After* Animal Infusion	Difference
Household income	101,967	118,0222	16,055**
Income from swine	12,528	23,528	11,000*

Note: ** p<0.05, * p<0.10

Similarly, the stories of most significant change support this positive effect of the AIRP. The storytellers were saying that because of their participation in the Animal Infusion project, they were able to earn more income from selling the animals that they were able to raise because of the project. To them this change was important because their income from animal raising helped them to defray household expenses, send their children to school, and even to accumulate savings.

One beneficiary from Sulat, Eastern Samar narrated that the AIRP *"was able to give us additional income. [The project] was able to support my child's education. I was also able to make a hut in our farm and [the project] was able to help in providing for*

the daily needs of the family." Moreover, a beneficiary from Motiong, Western Samar expressed that *"We were able to earn money; the sale of our pig was able to help us. It was a big help because I was able to pay the school fees and the electric bills."*

4.5.1.7 Impact of the Animal Health Services Provided by the A-PLP

The Animal Health Information System (Phil-AHIS) implemented by the A-PLP was successful in terms of maintaining the FMD-free status of animals in Samar Island. This implies the need to sustain and even improve the reach and efficiency of the service.

The A-PLP likewise provided vaccination and deworming services. Analysis on the impact of these services to carabao mortality and morbidity rate was done among carabao raisers. For mortality rate analysis, carabao raisers who availed of vaccination were compared to those who did njot avail. Similarly, morbidity rate was compared between carabao raisers who availed of deworming and those who did not.

Based on the survey data, only a very limited number of farmers (6%) availed of vaccination for their carabaos. In contrast, almost half (47%) of the carabao raisers surveyed accessed the deworming service of A-PLP (Table 70).

Table 70. Availment of vaccination and deworming services for carabaos in Samar Island

Availment of Service	Vaccination		Deworming	
	No.	%	No.	%
Availed	16	6.35	118	46.83
Did not avail	236	93.65	134	53.17
Total	252	100	45	100

Apparently, the low availment of vaccination among carabao raisers was due to their previous bad experience which involved the detrimental effects of late vaccination. A few decades ago, an epidemic occurred among carabaos in Samar Island. Vaccination against the disease was done late, at a stage when the disease already infected the animals. As a consequence, vaccination was not anymore effective, leading to high mortality rates.

It is hypothesized that vaccination may help reduce the incidence of mortality among calves of carabao. However, the estimated impact of vaccination on the mortality rate of carabao produced mixed results and the impact estimate (ATT) is not robust across matching techniques. Table 71 shows that for nearest neighbour matching impact estimate is zero, for the the kernel matching the impact is lower mortality but it is not statistically significant suggesting that there is no statistical difference in the mortality rate of those that availed of vaccination and those that did not avail. It is only in radius matching that the impact of vaccination on mortality rate is negative and statistically significant, implying significant reduction in mortality rate. The inconsistency of the impact estimate can be attributed to the very limited sample size. Only 11 respondents who availed of vaccination were matched with 173 respondents who were not able to avail of vaccination.

Table 71. Impact of vaccination on the mortality rate (%) of carabao between the beneficiaries and non-beneficiaries in Samar Island

Mortality Rate (%)	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiaries (%)	0.00	0.00	0.00
Non-beneficiaries (%)	0.00	2.08	4.61
ATT (%)	0.00	-2.08	-4.61***
Bootstrap SE[§]	6.87	2.59	1.34
z	0.00	-0.80	-3.43
P>|z|	1.00	0.42	0.00
Beneficiary (n)	11	11	11
Non-beneficiary (n)	173	173	173

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

Similarly, the impact of deworming on morbidity rate of carabaos did not show conclusive significant results (Table 72). On average, the morbidity rate of those who availed of deworming is around 3.19% and for the matched control group or those that did not avail of deworming ranges from 3 to 5%. The difference in morbidity rate between the treated and control group ranged from -0.53% to -2.51% suggesting that those who availed of deworming has lower morbidity rate compared to those who did not avail, however, the impact is not statistically significant.

Table 72. Impact of deworming on the morbidity rate (%) of carabao between the beneficiaries and non-beneficiaries in Samar Island

Morbidity Rate (%)	Nearest Neighbour	Kernel Matching	Radius Matching
Beneficiaries (%)	3.19	3.19	3.19
Non-beneficiaries (%)	4.02	5.71	3.73
ATT (%)	-0.82	-2.51	-0.53
Bootstrap SE[§]	6.85	2.83	2.41
z	-0.12	-0.89	-0.22
P>|z|	0.90	0.37	0.82
Beneficiary (n)	87	87	87
Non-beneficiary (n)	96	96	96

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

The above results imply that vaccination and deworming services have emerging positive impacts. Efforts should be done to increase the reach of beneficiaries and more effective administration of said services.

4.5.2 Social Impact

Aside from economic impact that is supported by both quantitative and qualitative analyses, the A-PLP also generated social impact. This is primarily in terms of change in

knowledge about livestock raising as narrated by the beneficiaries in their stories of most significant change.

For example, a carabao raiser from Western Samar claimed that he gained more knowledge about the carabao and its proper care from the AI seminar he attended. Accordingly, this has widened his knowledge about carabao raising and its benefits. For goat raisers, the SAIS RED project provided opportunity to develop positive attitude toward goat raising as well as enhanced their knowledge and skills. The capability building activities like trainings and educational tour/*Lakbay-Aral* broadened their knowledge about goat raising. One beneficiary from Mercedes, Eastern Samar narrated *"My knowledge about goat raising widened… This change helped me in raising and increasing the number of my goats."* For his part, a goat raiser from Sta. Rita, Western Samar took pride in saying that *"I experienced change when I learned how to take care of goats. Many people are now coming to our place to ask for suggestion and to gain more knowledge about goat raising."*

The SAIS RED project also helped improve the farmers' attitude towards goat raising. One beneficiary from Salcedo, Eastern Samar narrated that *"([When I participated in the SAIS RED], I learned about the importance of goat raising and how to value this… I realized that goat raising is good, it can help us in some ways."* Moreover, a farmer from San Isidro, Northern Samar became more interested in goat raising saying, *"I became more interested in goat raising, especially when I learned about the technologies."* Meanwhile, a beneficiary from Sta. Rita, Western Samar narrated *"First, I became confident in taking care of my goats. Now know pretty well how to feed my goats and to house the animals. I could say that it's good to engage into goat raising..."* The project also helped improve the farmers' goat raising skills. Another beneficiary from Salcedo, Eastern Samar shared: *"I learned to raise goats without anymore asking questions from OMAS. I learned how to assist the female goats in delivering kids. It is important to me because our lives have changed since we started raising goats. I don't anymore depend on the LGU [in terms of goat raising techniques]."*

Similarly, the recipients of the AIRP shared stories on improved attitude towards animal raising. A recipient of chickens from Calbiga, Western Samar narrated: *"We were recognized because we were able to properly take care of chickens. Others would say I have already many chickens, and I am happy. [this change is important because] Animal raising has become my leisure activity now that I am getting old. It's better than just staying idle, it allows me to enjoy."* Another recipient of a goat breeder from Pinabacdao, Western Samar shared: *"I now enjoy taking care of goats. [This is important because] I have already stopped going to cockfights due to my goats."*

Another social impact of the A-PLP is increased livelihood opportunities especially among beneficiaries of the UNAIP and SAIS RED project. Their involvement in said program/project enabled them to raise crossbred carabaos and goats. These animals in turn produced more milk for sale. In addition, some farmers engaged in processing and selling of white cheese from carabao milk. An enterprise on production and sale of forage planting materials has also emerged in the project sites.

4.5.3 Environmental Impact

The primary environmental impact of the A-PLP in Samar Island was through improvement in the genetic composition of the herd. The various program/project

interventions led to the production and reproduction of better-quality offsprings in terms of growth, meat and milk production potential. Animals that grow and produce meat and milk more efficiently would produce less waste or environmental pollutants (e. g. greenhouse gases) for every unit of meat or milk produced. In the case of milk production, crossbred carabaos are capable of producing twice the amount of milk compared to native carabaos. One crossbred carabao could therefore produce two liters of milk using the same amount of feed and producing the same greenhouse gases (from feed digestion) as a native carabao that produces only one liter of milk. As such, if two native carabaos are used to produce two liters of milk, they would need about twice the amount of feed and produce about twice the amount of greenhouse gases compared to that of the crossbred.

The environmental impact is also similar, but maybe in smaller scale, in the case of meat production. This is because crossbreds or improved animal breeds introduced by the A-PLP have the capability of growing faster, using basically less feed and producing less greenhouse gases per unit of growth, compared to native animals.

4.5.4 Impact of A-PLP as Revealed by the Livestock Raisers' Stories of Significant Change

To supplement the quantitative data on the impacts of the Agri-Pinoy Livestock Program (A-PLP), qualitative indicators were also determined using the stories of significant change narrated by the program beneficiaries. The stories were gathered 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 107 significant change stories (Table 73) were collected from the three provinces of Samar Island. The highest number of stories came from Western Samar (66 stories), followed by Eastern Samar (29 stories). The least number of significant change stories came from Northern Samar (12 stories).

Table 73. Distribution of significant change stories by province and A-PLP component project

Project Component	Province			Total	Percent
	Western Samar	Eastern Samar	Northern Samar		
Artificial Insemination	42	2	3	47	44
SAIS RED	8	16	9	33	31
Animal Infusion	16	11	-	27	25
Total	66	29	12	107	100
Percent	62	27	11	100	

The selected respondents of this study were involved in any or a combination of program components, but the most significant changes reported were only those related to Artificial Insemination (AI), the Samar Island Small Ruminant Enterprise Development (SAIS RED) Project, and Animal Infusion. More than two-fifths (44%) of

the significant change stories gathered from the A-PLP beneficiaries were about the outcomes of the beneficiaries' adoption of the AI technology, nearly one-third (31%) were about the outcomes of their involvement with the SAIS RED Project, and the remaining one-fourth (25%) were about the outcomes of participating in the Animal Infusion Project (Table 73).

4.5.4.1 Changes Experienced by the Beneficiaries of the Artificial Insemination Program

To determine the range of changes experienced by the beneficiaries of the AI Project, the collected stories were grouped into domains or broad categories of change. Results of the broad categorization done revealed that the stories of change told by the AI beneficiaries belonged to three domains, namely: (1) change in knowledge; (2) change in product quality; and (3) change in the beneficiaries' lives. The highest number of stories was about changes in the beneficiaries' lives (72%), followed by change in product quality (26%), and change in knowledge (2%) (Table 74).

Table 74. Distribution of significant change stories about outcomes of AI adoption per province and domain of change

Domain of Change	Province			Total	Percent
	Western Samar	Eastern Samar	Northern Samar		
1. Change in knowledge	1	-	-	1	2.13
2. Change in product quality	11	1	-	12	25.53
3. Change in the beneficiaries' lives	30	1	3	34	72.34
Total	42	2	3	47	100.0

To understand the kinds of change under each domain or category of change, the stories were subjected to thematic analysis. Moreover, to determine if adoption of the AI technology had really made an impact on the animal raisers who adopted the technology, the themes of changes were further classified based on Bennett's Hierarchy of Program Outcomes.

4.5.4.1.1 <u>Changes in Knowledge</u>

There was only one story under this domain (Table 75). This was about increase in knowledge on carabao raising, which was narrated by an AI beneficiary from Western Samar (Story No. AI-1). He narrated that by attending seminars about Artificial Insemination, he gained more knowledge about carabao and its proper care. He said this change is important because it widened his knowledge about carabao raising and its benefits.

Table 75. Theme of change under Domain 1 (change in knowledge)

Theme of Change	Description	Reason for Considering the Change Important	Project Site	Number of Stories
Increase in knowledge	Because of the trainings on artificial insemination, the storyteller gained more knowledge about carabao raising and how to earn income from it.	It widened the storyteller's knowledge about carabao raising and its benefits.	Western Samar	1

4.5.4.1.2 Changes in Product Quality

There were 12 stories under this domain (Table 76). Eleven (92%) were narrated by AI adopters from Western Samar, and the remaining one story was told by an AI beneficiary from Eastern Samar. All of the 12 stories fall under one theme, which was about "better quality offspring" as a result of artificial insemination. These "better offspring" according to them grow faster and produce more milk. As narrated by a storyteller from Western Samar,

Maganda dahil ngayon hindi lang native na kalabaw ang aking inaalagaan, may mestizo na rin… pwede ko itong ibenta sa malaki na halaga dahil sadyang malalaki sila. (It's good because now I am not only taking care of native carabaos, I already have crossbreeds now… I can sell it at a higher price because they are bigger.) [Story No. AI-6]

Another storyteller from Western Samar pointed out the capability of the crossbreeds to produce more milk. He said:

Marami ang milk na pino-produce ng AI na kalabaw kaya importante ito sa amin dahil nakatulong rin ito kahit papaano… nakakatulong sa akin at nakakatulong sa pag-aaral sa mga apo ko. (The carabao offspring conceived through AI produces more milk so it is important for us because it was able to help us… it was able to help me and in sending my grandchildren to school.) [Story No. AI-13]

Similarly, the storyteller from Eastern Samar said he considered it an important change when his carabao was able to produce a buffalo offspring and when he knew there are new ways of impregnating carabaos. He said:

[Tungod han AI], nakapag-anak iton amon karabaw hin buffalo… Maupay ini kay nahabaro na kami nga may ada na kinabag-o nga pampaburod ha karabaw… ([Because of AI], our carabao was able to give birth to a buffalo…It is good because we came to know that there are new ways of impregnating carabaos…) [Story No. AI-2]

Table 76. Theme of change under Domain 2 (change in product quality)

Theme of Change	Description	Reasons for Considering the Change Important	Project Site	Number of Stories	Percent

Better quality offspring	Because of AI, they were able to own and raise improved breed of carabaos, which grow faster and produce more milk.	It was their first time to raise an improved breed of carabao. They came to know that there is a new technology to impregnate carabaos. The crossbreed carabaos grow faster and produce more milk, so it can become a good source of livelihood.	Western Samar Eastern Samar	11 1	91.7 8.3
Total				12	100.0

4.5.4.1.3 Changes in AI Beneficiaries' Lives

There were 34 stories under this domain (Table 77). These stories represent six kinds of change, namely: improvement in farming capability (5 stories), additional livelihood (9 stories]), more income (10 stories), able to send children to school (4 stories), able to buy farm implements (3 stories), and improved living conditions (3 stories).

Improvement in Farming Capability. The five stories with this theme were about the farmers' being able to till a bigger portion of their farms when they get to own improved breed of carabaos through AI. These hybrid carabaos, according to them, were bigger and so these could till bigger farm areas. According to a farmer from Eastern Samar:

Napagtanto ko na ganun pala ka importante ang pag-aalaga ng mestizo na kalabaw kasi malaki talaga ang naitulong sa amin sa pagsasaka sa bukid at pagkain sa araw-araw. Ang masasabi ko lang, maganda talaga gamitin ang kalabaw na AI offspring kaysa sa galing sa natural mating kasi malakas at mabilis magtrabaho, hindi mahirap alagaan. (I realized that raising carabaos is important because it helps a lot in our farming [activities] and in providing for our food everyday. I can say that it is really better to use a carabao from AI than a carabao produced through natural mating because the former is stronger and works faster, it's not difficult to take care.) [Story No. AI-14]

A farmer from Western Samar also narrated that:

Nakapagpabago sa akin dahil nakatulong ang kalabaw sa pag-aarado ngan pagtatanum ha farm. Malawak na ang aking palayan dahil sa pag-aarado ng kalabaw. (It caused change in me because the carabao was able to help me in the plowing and planting in my farm. My rice farm is now bigger because I have a carabao that can be used for plowing.) [Story No. AI-18]

Additional Livelihood. There were nine stories about this change and all of these were shared by AI beneficiaries from Western Samar (Table 77). Most of these stories were about having additional source of livelihood through the milk and/or white cheese that they derived from their crossbreed carabaos produced through AI. According to an AI beneficiary from Gandara, Western Samar:

Maganda kasi nakapag-milk production na ako at may buffalo na kalabaw na ako…. nakakapagbenta na ako ng gatas. (It's good because I am already into milk production and I already have a buffalo carabao… I have already sold milk.) [Story No. AI-34]

A lady storyteller from Gandara, Western Samar also said that she was able to produce white cheese from the milk she got from the crossbreed carabao, and she was already able to earn income from it. She said,

Nakagpag produce kami ng keseo dahil sa kalabaw at nagkakaroon din kami ng buffalo… kumita kami kahit papaano sa keseo at nagkaroon kami ng pampabaon ng mga anak araw-araw at pera para sa mga gastusin sa bahay. (We were able to produce white cheese because of the carabao and we were able to own buffalo… we were able to earn income from white cheese so we were able to provide daily allowance to our school children and have money for our daily household expenses.) [Story No. AI-36]

More Income. There were 10 beneficiaries who highlighted this kind of change (Table 77). Eight of them were from Western Samar, and the remaining two were from Northern Samar. Generally, their stories were about them earning more income from selling AI offsprings which were bigger than the native carabaos, and from selling carabao's milk. The additional income was used to provide for the needs of their families. According to one storyteller from Las Navas, Northern Samar:

Noong na AI [ang aming kalabaw], mas maganda ang naidulot. Lumaki ang income dahil mas mahal na ang benta dahil mas malalaki ang anak ng na AI [na kalabaw]. PhP25,000 ang anak ng na AI [na kalabaw] at ang native ay PhP15,000 lang. Mas maganda ang katawan ng kalabaw galing sa AI. Natulongan sa mga medisinang naibigay. *Importante [ito] dahil malaking tulong [ito] sa amin*. (AI had a good result. Our income increased because we could sell the carabao offspring coming from AI at a higher price since it is bigger. We could sell it at PhP25,000, while we could only sell the native carabao at PhP15,000. The carabao offspring from AI has more beautiful body because of the medicines given to it. It [the change] is important because it has helped us a lot.) [Story No. AI-19]

Table 77. Themes of change under domain on changes in people's lives

Theme of Change	Description	Reason for Considering the Change Important	Project Site	Number of Stories	%
Improvement in farming capability	Their capability to till their farms improved when they get to own and raise improved breed of carabao produced though the AI technology.	The animals are bigger than those produced using natural mating, so these can help them till bigger areas.	Western Samar (4), Eastern Samar (1)	5	14.7
Improved Livelihood	They gained additional livelihood because they were able to produce milk and/or white cheese from their hybrid buffalo produced through the AI technology. Some also said that through AI, it becomes easier to increase the number of their carabaos which they can sell later and become their source of income.	The milk and/ or white cheese produced from their hybrid buffalo can be sold and become their additional source of livelihood.	Western Samar	9	26.5
More income	They earned more income from selling the AI offspring because these animals are bigger than those produced using natural mating; they can also get more milk from the AI offsprings so they earn more income.	The additional income can help them provide for their families' needs	Western Samar (8), Northern Samar (2)	10	29.4

Theme of Change	Description	Reason for Considering the Change Important	Project Site	Number of Stories	%
Able to send children to school	Income from selling the crossbreed carabaos was able to help send their children to school	Children were able to continue/ finish schooling	Northern Samar (1) Western Samar (3)	4	11.8
Able to buy farm implements	They were able to buy farm machineries (thresher, tractor) and motorcycle from the sale of crossbreed carabaos	The farm implements lightened farm work and increase their incomes; Motorcycle facilitated travels to other places	Western Samar	3	8.8
Improved living conditions	The storytellers shared about several important changes that indicated improvement in their living conditions (*asenso sa buhay*), manifested by improvements in their carabao production activities, livelihood activities, income, and their ability to send their children to school.)	They were able to earn more income and generally experienced improvements in their living conditions.	Western Samar	3	8.8
Total				34	100.0

A beneficiary from Western Samar also shared:

Maganda dahil dumami ang aming kalabao at nakapagbenta ako ng kalabao. Nakapagbenta rin ako ng gatas ng kalabao. Ang aking kita ay 450 sa isang araw. *[Importante ito] sapagkat naka-income ako at nakatulong sa pang araw-araw na gastusin*. (It's nice because the number of my carabaos increased and I was able to sell a carabao. I was also able to sell carabao's milk. My daily income from it is 450 pesos. [This is important] because I am able to earn income which is used to help in defraying our daily expenses.) [Story No. AI-25]

Able to Send Children to School. A total of four stories were about this kind of change (Table 77). Three of the stories were told by beneficiaries from Western Samar, and the remaining one story was shared by a beneficiary from Northern Samar. Generally, the kind of change that the storytellers considered significant was that they were able to continue sending their children and/or siblings to school through the income that they earned from selling crossbreed carabaos. According to a beneficiary from Western Samar,

… nakapagbenta na ako ng malaki sa anak ng AI at ipinambayad ko sa school ng anak ko. *Naka-graduate ang anak ko dahil sa pag benta ko ng anak ng AI*. (…I was able to earn a big sum from the sale of my carabao from AI and I used it to pay for the school fees of my child. My child was able to graduate because of the sale of the carabao offspring from AI.) [Story No. AI-40].

A beneficiary from Catarman, Northern Samar also narrated:

Nang mapa-AI na ang kalabaw ko at nabuntis na ito. *Naibenta ko nang malaki ang anak [ng kalabaw] at nakatulong ito sa pag-aaral ng dalawa naming anak*. (When my carabao had been artificially inseminated and it became pregnant. I was able to sell at a bigger price the carabao offspring from AI and it was able to help in the education of our two children). [Story No. AI-38]

Able to Buy Farm Implements. Three stories were telling about this theme of change (Table 77) and all of these were told by beneficiaries from Western Samar. They said they were able to buy farm implements using the money they earned from selling the AI offspring. To them this change is important because it lightened their work in the farm and it enabled them to earn more income. According to a beneficiary from San Jorge, Western Samar:

Nakabili ako ng mga gamit sa farm, mga machineries like tractor. Ang mga machineries na ito ay nakapag pagaan ng aking mga trabaho at nakapagpa bilis ng aking mga trabaho. Nakabili ako ng mga machineries dahil noong manganak ang AI caracao ibinenta ko ang anak. *Itong pagbabago ay mahalaga dahil nakatulong sa aking personal income at ganoon din naman sa aking farm*. (I was able to buy farm implements, machineries like tractor. These machineries made my work in the farm lighter and faster. I was able to buy machineries because I sold the caracao offspring produced through AI. This change is important because it has helped improve my personal income and my farm.) [Story No. AI-44]

Another beneficiary from Brgy. Arong, Gandara, Western Samar narrated that aside from being able to buy a thresher, he was also able to buy a motorcycle. Both of these were useful in his farm activities. He said:

Nakabili ako ng motor at thresher dahil nakapag produce [ako] ng AI offspring na buffalo. Significant change kasi yong thresher ay nakakatulong sa bukid. Instead na gagastos pa kami sa labas para magpa thresher ng palay, kami na ang nag thresher. Yong motor naman nagagamit namin sa pagpunta sa Gandara. (I was able to buy a motorcycle and a thresher because of the AI offspring which is a buffalo. It is a significant change because the thresher was very helpful in our farm. Instead of spending to have our rice harvest threshed outside, we did the threshing using our thresher. On the other hand, we use the motorcycle in going to Gandara.) [Story No. AI-42]

Improved Living Conditions. There were also three stories about this kind of change, all of which came from Western Samar (Table 77). The storytellers shared about several important changes that indicated improvement in their living conditions (*asenso sa buhay*), specifically manifested by improvements in their carabao production activities, livelihood activities, income, and their ability to send their children to school. According to a beneficiary from Brgy. Cansandig, Gandara, Western Samar:

Nakapagparami kami ng gatas ng kalabao at mabilis tumubo ang kalabao at nagging malaki ito. [Importante] d*ahil ito ay nagpa-asenso sa buhay at nakapag paaral sa mga anak ko*. (We were able to increase our production of carabao's milk, and the carabao grew fast and is now already big. [This is important] because it enabled us to improve our lives and I was able to send my children to school.) [Story No. AI-47]

4.5.4.1.4 Levels of Changes and Indicators of AI Technology Impacts

To determine the levels of impacts of AI technology adoption, 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, according to Sutherland and Leech, to measure evidences further up the ladder of the hierarchy (i.e., Levels 4 to 7 in Bennett's Hierarchy).

Results of the analysis of the levels of the AI Program impacts are presented in Table 78. All of the changes described in the stories shared by the AI Program beneficiaries belonged to the higher levels of Bennett's Hierarchy of Program Evidence (i.e., levels 5 and 7). Almost all of the stories (97.9%) 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 10). This suggests that the AI program had already contributed to the improvement in the farming and economic conditions of the AI beneficiaries in the Samar island. It enabled the beneficiaries to own and raise improved breed of carabaos, which helped some of the farmers to improve their farming capability, livelihood opportunity, and even their income. Some families were able to send their children to school, while others were able to buy farm implements using the income earned from selling crossbreed carabaos and its products (i.e., milk and

cheese). This further suggests that the AI program had already made positive impacts on the adopters of the AI technology.

Table 78. Levels of program outcomes to which the changes experienced by the AI beneficiaries correspond

Level of Outcomes	Theme of Change	Project Sites	Number of Stories	Percent
5 – KASA Changes	Increase in knowledge about carabao raising	Western Samar	1	2.1
7 – End results (Changes in the conditions of the program clientele)	Better quality offspring	Western Samar (11), Eastern Samar (1)	*12*	*25.5*
	Improvement in farming capability	Western Samar (4) Eastern Samar (1)	*5*	*10.6*
	Additional livelihood	Western Samar	*9*	*19.1*
	More income	Western Samar (8) Northern Samar (2)	*10*	*21.3*
	Able to send children to school	Western Samar (3) Northern Samar (1)	*4*	*8.5*
	Able to buy farm implements	Western Samar	*3*	*6.4*
	Improved living conditions	Western Samar	*3*	*6.4*
Sub-total			46	97.9
Total			47	100.0

Although all of the stories captured by the story collectors during the individual interviews were about positive changes, participants of the focus group discussions conducted in Borongan, Eastern Samar; Calbayog City, Samar and in Catarman, Northern Samar revealed some problems in the implementation of the AI program that led to some negative changes. These problems include, among others, the inadequate number of local government AI technicians and the reduction in the number of active Village-based Artificial Insemination Technicians (VBAITs), which resulted in reduced AI activities for the carabao raisers, and the reduction in the number of animal raisers who have benefitted from the program. This suggests that there is a need for the program implementors to take a closer look at the problems hindering continuity of AI services so as to increase the probability of sustaining the benefits that have already been experienced by many of the AI beneficiaries.

4.5.4.2 Changes Experienced by the Beneficiaries of the SAIS RED Project

There were 33 stories about the significant changes experienced by the storytellers as a result of their participation in the Samar Island Small Ruminant Enterprise Development (SAIS RED) Project (Table 79). Results of the broad categorization revealed that these stories of change belonged to four domains, namely: (1) change in

knowledge and attitude; (2) change in practice; (3) change in product quality; and (4) change in the beneficiaries' lives. The highest number of stories was about changes in the beneficiaries' knowledge and attitude (61%), followed by change in the beneficiaries' lives (18%), change in practice (15%), and change in product quality (6%).

Table 79. Distribution of significant change stories about the outcomes of participation in the SAIS RED Project per province and domain of change

Domain of Change	Province			Total	Percent
	Eastern Samar	Northern Samar	Western Samar		
1. Change in knowledge, attitude and skills	10	4	6	20	60.6
2. Change in practice	1	2	2	5	15.1
3. Change in product quality	1	1	-	2	6.1
4. Change in the beneficiaries' lives	4	2	-	6	18.2
Total	16	9	8	33	100.0

4.5.4.2.1 Changes in Knowledge, Attitudes and Skills

There were 20 stories under this domain of change (Table 80). The highest number of stories came from Eastern Samar (10 stories), followed by Western Samar (6 stories) and Northern Samar (4 stories). There were three kinds of change under this domain. These are: increase in knowledge about goat raising (13 stories), improved attitude towards goat raising (4 stories), and improved goat raising skills (3 stories).

Table 80. Frequency distribution of the stories under domain 1 (change in knowledge and attitude) by province and theme of change

Theme	Province			Total	Percent
	Eastern Samar	Northern Samar	Western Samar		
1. Increase in knowledge about goat raising	7	2	4	13	65.0
2. Improved attitude towards goat raising	1	2	1	4	20.0
3. Improved goat raising skills	2	-	1	3	15.0
Total	10	4	6	20	100.0

Increase in Knowledge About Goat Raising. Of the 13 stories with this theme, seven were told by the beneficiaries from Eastern Samar, two came from Northern Samar,

and four were from the beneficiaries in Western Samar (Table 81). The 13 stories generally revealed that because of the capability building activities (i.e., trainings, educational tours, and others) conducted by the SAIS RED implementers, the farmers' knowledge about goat raising widened. According to a storyteller from Mercedes, Eastern Samar:

Naging malawak ang aking kaalaman sa pag-aalaga ng kambing… Nakakatulong ang pagbabagong ito sa pagpapalaki at pagpapadami ng [aking mga] kambing. (My knowledge about goat raising widened… This change helped me in raising and increasing the number of my goats) [Story No. SAIS-1].

A storyteller from San Isidro, Northern Samar also shared:

Dati, bali-wala lang ang pag-aalaga ng kambing. Simula ng maka- training, nagkaroon ako ng kaalaman at nagamit namin ito sa aking mga alaga. (Before, I did not care about goat raising. Since I attended the training, I gained knowledge and I was able to use it for my animals.) [Story No. SAIS-8]

A beneficiary from Sta. Rita, Western Samar experienced becoming a source of information by others when he learned about goat raising through the SAIS RED trainings. He said:

Nakapagpabago ito sa akin noong natutunan ko na ang pag-alaga ng kambing… Marami na ang pumupunta sa amin upang humingi ng suggestion at para magkaroon sila ng kaalaman. (I experienced change when I learned how to take care of goats. Many people are now coming to our place to ask for suggestion and to gain more knowledge.) [Story No. SAIS-12]

Improved Attitude Towards Goat Raising. There were four (4) stories about this kind of change. One was narrated by a beneficiary from Eastern Samar, two were shared by beneficiaries from Northern Samar, and one was told by a beneficiary from Western Samar. In general, the storytellers were saying that because of the capability building activities organized by the project implementers, they learned to appreciate and became more interested in goat raising. One storyteller even said he became more confident to engage in raising goats. According to a SAIS RED beneficiary from Salcedo, Eastern Samar:

[Noong sumali ako sa SAIS RED], natutunan ko kung gaano ka importante ang pag-aalaga ng mga kambing at kung paano ito pahalagahan… Maganda pala ang pagkakambingan, nakakatulong din kahit papaano. ([When I participated in the SAIS RED], I learned about the importance of goat raising and how to value this… I realized that goat raising is good, it can help us in some ways.) [Story No. SAIS-14]

A beneficiary from San Isidro, Northern Samar said he became more interested in goat raising when he learned about the new technologies. He said:

Naging interesado pa lalo ako sa pag-aalaga ng goat, lalo na noong nalaman ko tungkol sa mga technologies. (I became more interested in goat raising, especially when I learned about the technologies.) [Story No. SAIS-15]

Table 81. Theme of change under Domain 1 (Change in Knowledge and Attitude)

Theme of Change	Description	Reasons for Considering the Change Important	Project Site	Number of Stories	Percent
Increase in knowledge on goat raising	Because of the capability building activities (i.e., trainings, *lakbay-aral*, etc.) conducted by the program implementers, their knowledge about goat raising (i.e., how to feed the animals, what medicines to give, how to build housing for goats, etc.) has widened.	The additional knowledge was able to help them raise and improve the number of their animals, realize that he can earn income from goat raising. They were able to share their knowledge to other people who have visited them to seek suggestions about goat raising.	Eastern Samar (7), Northern Samar (2), Western Samar (4)	13	65.0
Improved attitude towards goat raising	The storytellers learned to appreciate and became more interested in goat raising; one storyteller even said he became more confident to engage in raising goats.	They realized that goat raising is good because it can help them in some ways; one storyteller realized that it can help them change their lives	Eastern Samar (1), Northern Samar (2), Western Samar (1)	4	20.0
Improved goat raising skills	A storyteller said he was already able to apply what they learned from the trainings. Another said that he can already raise goats without anymore asking from the agriculture technicians, while one storyteller emphasized on his improved capability to use his money as capital for goat production.	Some aspects of their lives have changed since they started raising goats Things learned about goat raising from the trainings have become important inputs in their goat raising venture.	Eastern Samar (2), Western Samar (1)	3	15.0
Total				20	100.0

Meanwhile, a beneficiary from Sta. Rita, Western Samar said he became more confident to raise goats when he joined the SAIS RED project. He said:

Permero, naging confident na ako han pag atiman han akon mga kambing. Kahuman an pagpa kaon, an akon pagpa sirong han kambing, alam na alam ko na gud. Maka siring ko nga maupay ada nga may ada kambingan… (First, I became confident in taking care of my goats. Now know pretty well how to feed my goats and to house the animals. I could say that it's good to engage into goat raising...) [Story No. SAIS-16]

Improved Goat Raising Skills. The three stories about this kind of change came from the beneficiaries in Eastern Samar (2 stories) and Western Samar (1 story). A beneficiary from Salcedo, Eastern Samar said that because of his participation in the SAIS RED activities, he learned how to raise goats independently. He said:

…Pag-alaga ng kambing natutunan ko na hindi na nagtatanong sa OMAS; ako na ang nagpapa-anak. Mahalaga sa akin ito dahil may nabago sa buhay namin simula ng mag-alaga ako ng kambing. Hindi na ako umaasa sa kanila, ako nalang hindi na ako umaasa sa LGU. (…I learned to raise goats without anymore asking questions from OMAS. I learned how to assist the female goats in delivering kids. It is important to me because our lives have changed since we started raising goats. I don't anymore depend on the LGU [in terms of goat raising techniques].) [Story No. SAIS-18]

The beneficiary from Calbayog, Samar emphasized on the improvement in her capability to use capital for her goat raising venture when joined the SAIS RED project. He said:

Marami akong nalaman lalo na sa pag gamit ng capital…. ginagamit ko na sa tama ang aking pera lalong-lalo na sa pag provide ng pangangailangan ng mga kambing. (I learned a lot especially on the use of capital…. I am now using my money correctly especially in providing for the needs of my goats.) [Story No. SAIS-20]

4.5.4.2.2 Change in Practice

The five stories under this domain of change are represented by two themes, namely: (1) use of new technology in goat raising (4 stories), and (2) being able to establish a backyard forage farm (1 story) (Table 82).

Use of New Technologies in Goat Raising. Two of the four stories about this kind of change were narrated by SAIS RED beneficiaries from Western Samar, one story was told by a beneficiary from Northern Samar, and another one story was shared by a beneficiary from Eastern Samar (Table 80). A beneficiary from Mercedes, Eastern Samar shared that because of his participation in the SAIS RED project, his techniques in goat raising changed. He said:

Naiba ang aking techniques sa pag-aalaga ng kambing. Ngayon alam ko na ang makabagong techniques. (My techniques in taking care of goats have changed. Now I know about new techniques.) [Story No. SAIS-21]

Table 82. Themes of change under Domain 2 (Change in Practice)

Theme of Change	Description	Reasons for Considering the Change Important	Project Site	Number of Stories	Percent
Use of new technology in goat raising	The story tellers said they used the new technology learned from the trainings, like rotational grazing, confinement method, stall feeding, deworming and others.	Because it is easier to take care of goats using new technologies; they learned more about the correct way of taking care of goats.	Eastern Samar (1), Northern Samar (1), Western Samar (2)	4	80.0
Able to establish a forage farm		Now he already knows how to plant forage trees	Northern Samar (1)	1	20.0
Total				5	100.0

A beneficiary from Palapag, Northern Samar specified the technologies that he learned to use after attending trainings on goat production. According to him:

[I was able to use] breakthrough technologies like rotational grazing, confinement method, stall feeding, deworming, vitamins, propagation of recommended pasture grasses, and leguminous trees. [This change is important] because the system of raising goats before is [already] obsolete…. [Story No. SAIS-22]

A beneficiary from Western Samar also said:

Ginamit ko ang technology for my goat production… Mahalaga ito kasi mas nalaman ko ang tamang paraan ng pag-aalaga ng kambing. (I used the new technology for my goat production… It is important because I learned more about the correct ways of taking care of goats.) [Story No. SAIS-24]

Able to Establish a Forage Farm. The story about being able to establish a backyard forage farm because of SAID-RED was shared by a beneficiary from Victoria, Northern Samar (Table 83). According to him:

Doon ko nalaman kung papaano mag tanim ng pasture, palaki ng puno, ano ang pamatay ng insekto doon. Talaga ako pa ang gumawa ng backyard farm [dito]. Maligaya kami na nakatanim kami dahil safe naman kami pag summer dahil may shade. (It was there that I know how to grow pasture crops, how to grow forage trees, what are the chemicals to kill insects. I am the only one who was able to establish a backyard [forage] farm [here]. We are happy that we were able to plant forage trees because we are safe during summer since we have shade [provided by the trees].) [Story No. SAIS-25]

4.5.4.2.3 Change in Product Quality

There were only two stories under this domain of change. One was narrated by a beneficiary from Eastern Samar, and the other was narrated by a beneficiary from Northern Samar (Table 83). These two stories have the same theme, which was about improvement in the breed of goats they were raising. According to the story teller from General MacArthur, Eastern Samar:

Para sa amin, yung pinaka-malaking pagbabago ay yung upgrading ng animals namin lalo na sa mga kambing, lalo na po dito sa municipality namin na ang mga kambing ay native… sa pamamagitan ng SAIS RED, binigyan po ang farmers ng pagkakataon na ma-improve yung lahi ng kanilang kambing. So in the long run we are hoping that our kambing magiging puro at upgraded na. At tsaka makapagbigay din kami ng services sa other farmers through services na rin namin sa buck namin na na- acquire from the region through SAIS RED…. napaka-importante yung availment namin ng livestock dahil yung observation ko po dito sa municipality namin, kahit na mayroon pa galing sa ibang bayan, pero mga upgraded lang. Pero dito sa SAIS RED, binigyan kami ng pagkakataon na mabigyan ng isang livestock na maganda ang lahi para ma-improve yung native goat natin. (For us, the biggest change is the upgrading of our animals especially goats, because here in our municipality the goats are all native. Through SAIS RED, farmers are given the chance to improve the breed of their goats. In the long run, we are hoping that our goats would become pure and upgraded. Also, we hope to be able to give services to other farmers through the buck that we were able to acquire through SAIS RED…. Our availment of livestock is really valuable and very important because in my observation, the goats in our municipality, even if there are those coming from other towns, still these are only upgraded. In SAIS RED, we were given the chance to own a livestock with a good breed to improve the breed of the native goats.) [Story No. SAIS-26]

Table 83. Theme of change under Domain 3 (Change in Product Quality)

Theme of Change	Description	Reasons for considering the change important	Project Site	Number of Stories
Improved breed of goats	The goats they raised became upgraded	They were able to own improved breed of goats, which have already increased in number.	Eastern Samar (1) Northen Samar (1)	2

The story teller from San Isidro, Northern Samar also narrated that because of the SAIS RED program, he was able to raise crossbreed goats, and the number of his animals has already increased. He said:

Nakapagpabago sa akin dahil ang aking mga kambing ay naging crossbreed at ito'y dumami… may mga anak na yung kambing na crossbreed at ang anak nito ay naging sampu na…. (It changed me because my goat became a crossbreed and it has increased

in number…. my crossbreed goat has already delivered offsprings, which have reached 10 as of now….) [Story No. SAIS-27]

4.5.4.2.4 Change in Beneficiaries' Lives

There are six stories under this domain, and these are represented by two themes, namely: (1) increase in crop yield (1 story) and (2) increase in income (5 stories) (Table 84).

Table 84. Themes of change under Domain 4 (Change in Beneficiaries' Lives)

Theme of Change	Description	Reasons for Considering the Change Important	Project Site	Number of Stories	Percent
Increase in income	Because of the SAIS RED project, they were able to raise more goats and earn more income from the animals and its products (i.e., milk) which provided solutions to their everyday problem	Additional income was able to help in their daily expenses and in providing allowance to their children who are studying.	Eastern Samar (3) Northern Samar (2)	5	83.3
Increase in crop yield	He was able to get good yield from his rice and vegetables when he used goat manure as fertilizer	He was able to experience increase in crop yield	Eastern Samar (1)	1	16.7
Total				6	100.0

Increase in Crop Yield. There was only one story with this theme, and this was shared by a SAIS RED beneficiary from Llorente, Eastern Samar. According to the beneficiary, while waiting for the goats to grow, he used the manure as fertilizer for his rice and vegetable plants. As a result, he experienced good yield from his crops. He said:

Ginamit kong fertilizer sa gulay at palay sa aking farm ang mga dumi ng kambing. Nakatulong ito dito. Naging maganda ang ani dahil nalagyan ng fertilizer. Simula ng nakapaglagay ako ng fertilizer ay nakapagbenta na ako ng ani doon sa bayan. (I used the goat manure as fertilizer for my vegetables and rice in my farm. It was able to help. My harvest has improved because of fertilizer application. Since I applied fertilizer [on my plants], I was able to sell some of my harvest in town.) [Story No. SAIS-28]

Increase in Income. The five stories with this theme were narrated by SAIS RED beneficiaries from Eastern Samar (3 stories) and Northern Samar (2 stories). The storytellers, in general, revealed that because of the SAIS RED project, they were able to raise more goats and earn more income which provided solutions to their everyday problems. According to a storyteller from Eastern Samar:

Dahil sa pag benta ng kambing natulungan ang gastusin namin sa bahay…. Nakatulong ito sa mga allowance ng anak ko na nag-aaral at nabibigyan pa ng baon. Kung marami sana ang naibigay nilang kambing hindi lang sana yun ang naitutulong nito sa amin. (Selling goats was able to help us defray our household expenses…. It was able to help in providing allowance of my children who are in school. If only they gave us more goats, it's not the only help that can be given to us.) [Story No. SAI-29]

Another beneficiary from Llorente, Eastern Samar, highlighted the contribution of goat's milk in raising his income. He narrated:

Nagkaroon na ako ng maraming gatas galing sa aking kambing dahil noong una kong inalagaan na kambing kaunti lang ang naibigay na gatas kaya hindi ako nakapagbenta doon sa bayan. Noong mag-anak na yung galing sa SAIS RED doon na dumami yung gatas, nadagdagan yung income. (I was able to produce more milk from my cross-breed goats. Before, my native goats were only able to produce less volume of milk that is why I was not able to sell milk in the Poblacion. When the goat from SAIS RED delivered its offspring, it was able to produce more milk, so my income increased.) [Story No. SAIS-31]

A story teller from San Roque, Northern Samar also revealed that he earned more income from his crossbreed goats because it could be sold at a higher price. He said:

Dumami yung kambing namin at kumita kami ng malaki rin… yun po ang nakita ko na simula noong nagkaroon ng kambing na mestizo, nagka-anak at naibenta ng medyo mahal-mahal kaysa may lahi na native. Yung 15 kilos kasi na native ay PhP2,000 pero ang 20 kilos na mestizo ay nandyan sa PhP5,000 hanggang PhP6,000. (The number of our goats increased and we were able to have more income…. it's what I have observed since we were able to have a crossbreed goat. It was able to deliver offsprings which we were able to sell at higher price than the natives. A native goat weighing 20 kilos could be sold at PhP2,000 only, while a 20kilo-crossbreed goat could be sold at PhP5,000 to PhP6,000.) [Story No. SAIS-33]

4.5.4.2.5 Levels of Changes and Indicators of SAIS RED Project Impacts

To determine the levels of impacts of the SAIS RED 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 of the levels of the SAIS RED Program impacts are presented in Table 85. All of the changes considered significant by the SAIS RED Program beneficiaries were positive, and these belonged to the higher levels of Bennett's Hierarchy of Program Evidence (i.e., levels 5 to 7). This suggests that the SAIS RED program was able to make positive impacts on the beneficiaries.

Table 85. Levels of program outcomes to which the changes experienced by the SAIS RED Project beneficiaries correspond

Level of Outcomes	Theme of Change	Project Sites	Number of Stories	Percent
5 – KASA Changes	Increase in knowledge on goat raising	Eastern Samar (7) Northern Samar (2) Western Samar (4)	13	
	Improved attitude towards goat raising	Eastern Samar (1) Northern Samar (2) Western Samar (1)	4	
	Improved goat raising skills	Eastern Samar (2) Western Samar (1)	3	
Sub-total			20	60.6
6 – Behavioral Changes	Use of new technology in goat raising	Eastern Samar (1) Northern Samar (1) Western Samar (2)	4	
	Able to establish a forage farm	Northern Samar (1)	1	
Sub-total			5	15.2
7 – End results (*Changes in the conditions of the program clientele*)	Increase in crop yield	Eastern Samar (1)	1	
	Improved breed of goats	Eastern Samar (1) Northern Samar (1)	2	
	Increase in income	Eastern Samar (3) Northern Samar (2)	5	
Sub-total			8	24.2
Total			33	100.0

The highest percentage of the stories (61%) was about changes in the beneficiaries' knowledge, attitude and skills in goat raising, which correspond to level 5 of Bennett's Hierarchy of Program Evidence. Nearly a fourth (24%) of the stories were about changes in the conditions of the program beneficiaries (i.e., improvement in the breed of goats raised, increase in crop yield, increase in income, and acquisition of properties), which correspond to the highest level of Bennett's Hierarchy of Program Evidence (i.e., Level 7). This suggests that the SAIS RED program was already able to make some contributions to the improvement in the farming and economic conditions of the beneficiaries in the Samar island. It enabled some beneficiaries to own and raise improved breed of goats, which they were able to sell and thus provided them with additional income which they used to defray daily household expenses and/or send their children to school.

4.5.4.3 Changes Experienced by the Beneficiaries of the Animal Infusion Project

There were 27 stories about the significant changes experienced by the beneficiaries of the Animal Infusion Project (Table 86). These stories of change belonged to two domains, namely: changes in knowledge and attitude (5 stories), and changes in

the beneficiaries' lives (22 stories). More than half of stories (59%) came from the beneficiaries in Western Samar, and the remaining 11 stories (41%) came from Western Samar.

Table 86. Distribution of significant change stories about the outcomes of participation in the Animal Infusion Project per province and domain of change

Domain of Change	Province		Total	Percent
	Eastern Samar	Western Samar		
1. Changes in knowledge and attitude	-	5	5	18.5
2. Changes in the beneficiaries' lives	11	11	22	81.5
Total	11	16	27	100.0
Percent	40.7	59.3	100	

4.5.4.3.1 Changes in Knowledge and Attitude

There were five stories under this domain and all of these were narrated by beneficiaries from Western Samar (Table 87). All of these five stories were about one theme only, and this was about improved attitude towards animal raising.

Table 87. Theme of change under Domain 1 (changes in knowledge and attitude)

Theme of Change	Description	Reason for Considering the Change Important	Project Site	Number of Stories
Improved attitude towards animal raising	The storytellers said that when they participated in the project, they learned to enjoy raising animals particularly chickens and goats	Animal raising became their leisure activity; one storyteller even said he stopped cockfighting because of his goat raising activity.	Western Samar	5

Improved Attitude Towards Animal Raising. In general, the story tellers were saying that when they became beneficiaries of the Animal Infusion Project, they learned to enjoy raising animals and considered it as their leisure activity. A story teller from Calbiga, Western Samar who was a recipient of chickens, shared that he became happy when people praised him because of his increasing number of chickens. He said:

Dinadayao ka kay nakapag-alaga ka hiton na manok, may iba na masiring na damo an ak manok, masaya po ako. [Importante ini kay] Libangan ko na kasi ini nga nagkaka-edad na ako kaysa naukoy la ako, nakakalingaw ha kalugaringon. (We were recognized because we were able to take care of chickens. Others would say I have

already many chickens, and I am happy. [this change is important because] Animal raising has become my leisure activity now that I am getting old. It's better than just staying idle, it allows me to enjoy.) [Story No. ANIN-1]

On other hand, a beneficiary of a breeder goat from Pinabacdao, Western Samar shared that he now enjoys taking care of goats, and he considers the change important because it helped him to leave his vice. He said:

Nalilibang na ako mag-alaga ng kambing. [*Importante ini kay] napapabayaan na yung sabung ko dahil sa mga kambing ko*. (I now enjoy taking care of goats. [This is important because] I have already stopped going to cockfights due to my goats.) [Story No. ANIN-5]

4.5.4.3.2 Change in Beneficiaries' Lives

There are 22 stories under this domain, and these are represented by six themes, namely: improved farming capability (4 stories), improved livelihood (1 story), increase in income (11 stories), reduced farming expenses (1 story), able to acquire assets (3 stories) and improved living conditions (2 stories) (Table 88).

Improved Farming Capability. The four stories with this theme were narrated by beneficiaries of the Animal Infusion project from Eastern Samar. Generally, they were telling that because of the project, they were able to own good breeds of carabaos that they used to cultivate their farms. To them, the change is important because it reduced their expenses for land preparation. The animals, they said, also provided them security as it can be sold in times of need. According to a beneficiary from San Julian, Eastern Samar:

Nakatulong ang kalabaw sa pag-araro ng lupa at nagkaroon kami ng opurtunidad na maparami ito at pwede ibenta sa panahon ng pangangalaingan. *Bawas ito sa gastos sa pag-araro bago ipa tractor; may security din na maibenta kung kinakailangan.* (The carabao was able to help us in plowing our farm and we had the opportunity to increase carabao production. The animals can be sold in times of need. It reduces our expenses in plowing the farm before having it plowed by a tractor; the animals also provide us security because they can be sold in times of need.) [Story No. ANIN-6]

Improved Livelihood. There was only one story about this kind of change and it was shared by a beneficiary from Motiong, Western Samar. By selling the animals that she was able to raise through the animal infusion project, she was able to obtain additional capital for her store. She said:

Nagka may-ada kami additional income, gingamit nga puhunan ha tindahan. *Mas nagdamo an amon paninda ha tindahan*. (We earned additional income that we were able to use as capital for our store. The volume of items sold in our store increased.) [Story No. ANIN-10]

Increase in Income. Of the 11 stories having this theme, five were shared by project beneficiaries from Eastern Samar, and six stories were told by project beneficiaries from Western Samar (Table 88).

Table 88. Themes of change under Domain 4 (Change in Beneficiaries' Lives)

Theme of Change	Description	Reasons for Considering the Change Important	Project Site	Number of Stories	Percent
Improved farming capability	Through the project, they were able to own good breeds of carabaos and/or goats that they were able to help them in their farming activities.	It reduced farming expenses; it also provided security in some ways because the animals that could be sold in times of need.	Eastern Samar	4	18.2
Improved livelihood	The storyteller was able to obtain capital for her store from the sale of her animals	With the additional capital, the volume of items sold in her store also increased	Western Samar	1	5.5
Increase in income	The storytellers were able to earn more income from selling the animals that they were able to raise because of the project	The income earned was used to defray household expenses and to help send their children to school. Two storytellers said they were even able to save because of the additional income they earned from raising pigs, goats and/or other animals.	Eastern Samar (5) Western Samar (6)	11	50.0
Reduced farming expenses	The storyteller said his expenses in tilling the farm reduced because of the carabao they obtained through the program.	The change is important because they need not spend big sum of money for the cultivation of their farm.	Eastern Samar	1	5.5

Able to acquire assets	One storyteller said that because of the program, he was able to own a carabao which he considered as an asset. Another storyteller said he was able to buy some kitchen wares using the income from animal raising, and one storyteller said he was able to build a fishing boat and have his CR repaired using the income from animal raising.	The acquired assets were able to provide them some comfort.	Eastern Samar (1) Western Samar (2)	3	13.6
Improved living conditions	The storytellers said that the income earned from raising pigs improved their living conditions as it enabled them to repair their house and to send their children to school.	I enabled them to satisfy their needs	Western Samar	2	9.1
Total				22	100.0

The storytellers were saying that because of their participation in the Animal Infusion project, they were able to earn more income from selling the animals that they were able to raise because of the project. To them this change is important because their income from animal raising helped them to defray household expenses, send their children to school, and even to save. According to a project beneficiary from Sulat, Eastern Samar:

Napagkakakitaan ito; madaling lumaki ang anak [nang mga hayup na bigay ng project] at naibibenta ito. Mas madali yung kita. (It is a source of income. The offsprings [of the animals given by the project] grow faster and it can be sold. You can earn income from it faster.) [Story No. ANIN-14]

Another beneficiary from Maglipay, Sulat, Eastern Samar also said:

Nakadagdag income. [It was] able to support [my] child's education. Nakahimo liwat ako hin kubo ha farm at nakatulong din sa mga pang araw-araw na pangangailangan sa pamilya. (It was able to give us additional income. [The project] was able to support my child's education. I was also able to make a hut in our farm and [the project] was able to help in providing for the daily needs of the family.) [Story No. ANIN-15]

The same kind of change was shared by a beneficiary from Motiong, Western Samar. He said:

Nagkataon nga nagka-kwarta kami, nakatabang gihapun an gibaligyaan sa baboy. Dako ang natabangan kay nakabayad sa skwelahan unya nakabayad og kuryente. (We were able to earn money, the sale of our pig was able to help us. It was a big help because I was able to pay the school fees and the electric bills.) [Story No. ANIN-19]

A beneficiary from Del Remedio, Sulat, Eastern Samar emphasized that her participation in the Animal Infusion program was able to help her family in their financial difficulty and enabled them to save. She said:

Parang dati makuri it financial pero yana nakakapag-save na. (Before, we had financial difficulty, but now we are able to save.) [Story No. ANIN-13]

Reduced Farming Expenses. There was only one story which emphasized this kind of change as a result of his involvement with the animal infusion project. This story was shared by a beneficiary from San Julian, Eastern Samar. He said:

Mas guti an akon gasto ha land preparation. Han waray pa carabao, makuri an pag land preparation, dako an gasto pero yana nakaiban na san gasto. (I had lesser expense for land preparation. Before we were given a carabao, land preparation was difficult for us, we had to spend big amount of money but now [that we have a carabao], our expenses are reduced. [Story N. ANIN-22]

Able to Acquire Assests. Of the three stories with this theme of change, two were shared by beneficiaries from Western Samar, and one story was told by a beneficiary from Eastern Samar. One storyteller from San Julian, Eastern Samar said that because of the program, he was able to own a carabao which he considered as an asset [Story No.

ANIN-23]. Another storyteller said he was able to buy some kitchen wares using the income from animal raising, and one storyteller said he was able to build a fishing boat and have his CR repaired using the income from animal raising. Below are the beneficiaries' descriptions of the changes they have experienced:

Nakabaligya kami [ng baboy], nakapalit kami ng mga bagay pang kusina. (We were able to sell [pigs] and we were able to buy some kitchen wares.) [Story No. ANIN-24; Calbiga, Western Samar]

Nakapagpagawa ako ng bangka at na renovate ko ang aming C.R. (I was able to build a [fishing] boat and I was able to renovate our CR.) [Story No. ANIN-25; Motiong, Western Samar]

Improved Living Conditions. There were two stories with this theme, and all of these were shared by beneficiaries from Western Samar. Generally, the storytellers were saying that due to their participation in the animal infusion program, they experienced improved their living conditions as the income they earned from raising pigs enabled them to improve their house and to send their children to school. For instance, according to a project beneficiary from Motiong, Western Samar:

It am huna-huna diri na parehas han una na waray ka maibulig. Yana nakapalit na ako hin yero, kahoy, poste ngan harigi ha balay. *Kun waray ak anay, waray pa gud ak kaka-atop it ha igbaw han amon balay*. (Our thinking is not anymore the same as before that we cannot extend any help. Now I am able to buy galvanized iron, lumber, and posts for our house. Had I not been given a breeder sow, I would not have been able to put the roofing for the second floor of our house.) [Story No. ANIN-26]

4.5.4.3.3 Levels of Changes and Indicators of Animal Infusion Project Impacts

To determine the levels of impacts of the Animal Infusion 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 of the levels of the Animal Infusion Project impacts are presented in Table 89. All of the changes considered significant by the Animal Infusion Project beneficiaries were positive, and these belonged to the higher levels of Bennett's Hierarchy of Program Evidence (i.e., levels 5 and 7). This suggests that the Animal Infusion component of the Agri-Pinoy Livestock Program (APLP) was able to make positive impacts on the beneficiaries.

A great majority (82%) of the stories were about changes in the beneficiaries' lives, which correspond to the highest level (Level 7) of Bennett's Hierarchy of Program Evidence. This suggests that the Animal Infusion component of APLP was able to make some contributions to the improvement in the farming and economic conditions of the beneficiaries in the Samar island. It enabled the beneficiaries to raise improved breed of animals, which they were able to use in the cultivation of their farms, or sell and thus provided them with additional income which they were able to defray daily household expenses, buy some household items, repair their house, and/or send their children to school.

Table 89. Levels of program outcomes to which the changes experienced by the Animal Infusion Project beneficiaries correspond

Level of Outcomes	Theme of Change	Project Sites	Number of Stories	Percent
5 – KASA Changes	Improved attitude towards animal raising	Western Samar	5	
Subtotal			*5*	*18.5*
7 – End results (*Changes in the conditions of the program clientele*)	Improved farming capability	Eastern Samar	4	
	Improved livelihood	Western Samar	1	
	Increase in income	Eastern Samar (5) Western Samar (6)	11	
	Reduced farming expenses	Eastern Samar	1	
	Able to acquire assets	Eastern Samar (1) Western Samar (2)	3	
	Improved living conditions	Western Samar	2	
Subtotal			*22*	*81.5*
Total			27	100.0

Although the stories captured by the story collectors were all positive, results of the focus group discussions with representative implementers from the Provincial Veterinary Offices (PVOs) and LGUs across provinces revealed some problems which resulted in some negative changes experienced by the beneficiaries. These problems, which the project implementers may need to take a closer look, include heavy workload of the technicians and the peace and order situation in some areas which limited monitoring activities by the project implementers, resulting to some animals getting sick and eventually died.

According to the FGD respondents in Catbalogan,

Nakukurian kami sa monitoring kay damo it amon functions; guti-ay la kami nga personnel working for the program. Heavy it amon workload; we have to attend to many projects. (We found it difficult to monitor [the project] because we have many functions; there are only few personnel working for the program. We have heavy workload; we have to attend to many projects.)

4.6 Net Benefits of the Unified National Artificial Insemination Program

As earlier presented, not all components of the A-PLP generated positive outcomes/impacts. For example, the Male Breeder Loan Program (MBLP) achieved its aim of introducing superior quality genetics but was not successful due to some problems discussed in the previous section. Meanwhile, the Samar Island Small Ruminant Enterprise Development (SAIS RED) Project was just completed in 2017. Although the

project showed emerging positive outcomes, these were not conclusive in terms of impacts. This is also true to the Animal Infusion and Restocking Program (AIRP). Dispersal of animals under AIRP especially the large ruminants (carabao and cattle) was done only about a year before the impact evaluation; hence animals were mostly not yet productive during the period of assessment.

Among the A-PLP components, the Unified National Artificial Insemination Program (UNAIP) on carabaos provided positive farm level impact. Moeover, other data needed to determine an industry-level impact in Samar Island were available to warrant the calculation of net benefits.

The benefits from adopting the AI technology for carabaos were estimated using standard welfare (economic surplus) analysis. The impact of the technology was modeled as a reduction in the unit cost of producing a kilogram of carabao meat that resulted from the larger and heavier offsprings of crossbred animals. Changes in the equilibrium price and quantity of carabao meat brought about changes in the level of welfare accruing to the carabao raisers (producers) and consumers and, therefore, a change in total economic welfare.

Changes in economic surplus (sum of the changes in producer and consumer surpluses) were estimated following Alston *et al.* (1995). Estimation of the *k*-shift was done by constructing an enterprise budget for raising a yearling of carabao using both primary and secondary data (Table 90).

A crossbred yearling is heavier than the native yearling, producing 21% more meat. This increase in meat production reduces the unit production cost by PhP14.18, bringing a reduction on the production cost per kg of meat by 13.25%. When related to a price of PhP138/kg, this gave an estimate of the *k*-shift (supply shift) of 10.28%. This is the estimated change in unit production cost as a proportion of the product price. Hence, adoption of the AI technology enabled the carabao raisers to lower their cost of producing carabao meat.

Table 90. Enterprise budget for yearling carabao production in Samar Island

Item	Native	Crossbred
Revenue (one yearling carabao)	19,320.00	23,460.00
Operating costs		
Caracow (depreciation)	3,120.00	3,120.00
Labor	6,843.75	6,843.75
Veterinary supplies	225.00	225.00
Shed house	1,000.00	1,000.00
Pasture/forage maintenance	3,600.00	3,600.00
Bull service/AI	200.00	1,000.00
Total costs	14,988.75	15,788.75
Operating profit	4,331.25	7,671.25
Amount of meat produced (kg)	140.00	170.00
Production cost per kg	107.06	92.88
Unit cost reduction	14.18	
Reduction in production cost per kg	13.25%	
k-shift	10.28%	

Given the parameters in Table 91, welfare changes were modeled. Welfare effects can be significantly influenced by the choice of product price and quantity. One can either choose the existing price and quantity when the technology was first adopted, or those at the time the analysis was done (Montes *et al.*, 2008; Francisco *et al.*, 2009). Values of price and quantity obtained from PSA for 2018 (period of impact evaluation) were used in the analysis.

Table 91. Parameters used in modeling welfare changes

Parameter	Value
Volume of production (kg)	4,517,000
Farm price (PhP/kg)	154
Supply elasticity	0.90
Demand elasticity	-2.98
Unit cost reduction (PhP/kg)	14.18
k-shift (%)	10.28

Sources of data: PSA (2019); Apolinares *et al.* (2013); *Orden et al.* (2013); Enterprise budget calculation

Estimating the equations for gains or surpluses for producers and consumers for a *k*-shift of 9.21% and the other parameters generated an annual potential welfare gain from adopting AI on carabaos in the amount of PhP66.13 million, 77% of which accrued to producers.

To estimate the actual welfare gains, the annual potential benefits were adjusted by the estimated rate of adoption of the AI technology over a 30-year period. Adoption is not merely the use of the AI technology but is based on the success of producing calf from the AI technology. Hence, a very conservative adoption rate was estimated as the ratio between the cumulative calf drop and carabao inventory in Samar Island per year. Data on carabao inventory and calf drop were obtained from PSA (2019) and Philippine Carabao Center (PCC) at VSU, respectively.

Table 92 shows the rate of adoption of the AI technology in Samar Island. It can be observed that said rate is very low from 0.08% in 2012 to 0.51% in 2018. The change in adoption rate between 2012 and 2018 ranged from 19% to 100% or an average of 48% over the seven-year period. Assuming a very conservative increase of 10% annually starting 2019, adoption rate can rise from 0.56% to 4.2% until 2040.

Table 92. Adoption rate of artificial insemination in carabaos based on calf drop in Samar Island

Year	Carabao Inventory	Calf Drop	Cumulative Calf Drop	Adoption Rate
2011	120,634	37	54	0.04%
2012	112,597	47	101	0.08%
2013	106,726	79	180	0.16%
2014	98,438	51	231	0.22%
2015	97,265	58	289	0.29%
2016	93,151	49	338	0.35%
2017	90,434	60	398	0.43%
2018	87,135	64	462	0.51%

Benefit-cost analysis was done to determine the worthiness of investments in the implementation of UNAIP in Samar Island during the A-PLP period. Streams of input costs and benefits were measured over time. The input costs included the investments of DA-RFO8 on semen straws, PCC on LN2 supplies and transportation, and LGUs on value of time by the livestock coordinator (equivalent to 20% of the salary) in facilitating the AI service. It was assumed that investments continued until 2040 with the rate of adoption rising to about 4.2%. On the other hand, the estimated actual benefits included the potential wefare gains adjusted by the estimated rates of adoption. In 2040, the future streams of costs and benefits were converted to perpetuity by dividing the values by the interest rate. The annuity of the perpetual flows caused the costs and benefits in the final year to be significantly larger than the other years. Benefits and costs were adjusted for the time value of money so that benefits and costs over time were expressed in their present values. The present values were estimated using 6% rate of interest.

Four scenarios were analyzed to test the robustness of the results. The first scenario serves as baseline where the investment continues until 2040 and the rate of adoption rises to 4.2%. The second scenario is an ex-post analysis where the investment and adoption rate were held at their 2018 levels. Meanwhile, the third scenario assumes that the *k*-shift in the baseline scenario reduces by 20%. On the other hand, the fourth scenario assumes that real input costs in the baseline scenario increases annually by 20%.

Table 93 shows the present value of streams of benefits and costs of the UNAIP in the baseline scenario. The present value of real investment is PhP16.63 million while the present value of total benefits is PhP24.72 million. At 6% interest rate, the net present value (NPV) of the program was PhP8.09 million. The benefit-cost ratio (BCR) was 1.49:1 and the internal rate of return (IRR) was about 10%. The results demonstrate that the UNAIP is a worthwhile investment.

In the more conservative (ex-post) scenario, changes in estimated welfare gains were observed. This brought reduction in the financial measures considered in the analysis. Despite this, the program is still a worthwhile investment. It has an NPV of PhP0.10 million and BCR of 1.01:1. Its IRR is 6% (Table 94).

Meanwhile, assuming a larger reduction in the *k*-shift (from 9.21% to 7.37%) weakened a bit the financial return of the UNAIP in Samar Island. However, it still proved to be a worthwhile investment. Under a baseline scenario, a 20% reduction in the *k*-shift generated an NPV of PhP3.02 million, BCR of 1.18:1 and IRR of more than 7%. Increasing the real input costs of providing the AI technology annually by 20% further generated favorable financial measures that indicate positive net benefits. As shown in Table 95, NPV is PhP4.76 million, BCR is 1.24:1 and IRR is around 8%.

Table 93. Present value of investment and revenue streams

Year	Real Investment (in million PhP)	Adoption Rate	Present Value of Estimated Welfare Gains (2018) (in million PhP)		
			Producer Surplus	Consumer Surplus	Total Surplus
2011	0.62				
2012	1.36	0.08%	0.06	0.02	0.08
2013	1.55	0.16%	0.11	0.03	0.14
2014	1.19	0.22%	0.14	0.04	0.18
2015	0.54	0.29%	0.18	0.05	0.23
2016	0.68	0.35%	0.20	0.06	0.26
2017	0.53	0.43%	0.23	0.07	0.30
2018	0.57	0.51%	0.26	0.08	0.34
2019	0.54	0.56%	0.27	0.08	0.35
2020	0.51	0.62%	0.28	0.08	0.36
2021	0.48	0.68%	0.29	0.09	0.38
2022	0.46	0.75%	0.30	0.09	0.39
2023	0.43	0.82%	0.31	0.09	0.41
2024	0.41	0.91%	0.32	0.10	0.42
2025	0.38	1.00%	0.34	0.10	0.44
2026	0.36	1.10%	0.35	0.11	0.45
2027	0.34	1.20%	0.36	0.11	0.47
2028	0.32	1.33%	0.38	0.11	0.49
2029	0.30	1.46%	0.39	0.12	0.51
2030	0.29	1.60%	0.40	0.12	0.53
2031	0.27	1.76%	0.42	0.13	0.55
2032	0.25	1.94%	0.44	0.13	0.57
2033	0.24	2.13%	0.45	0.14	0.59
2034	0.23	2.35%	0.47	0.14	0.61
2035	0.21	2.58%	0.49	0.15	0.63
2036	0.20	2.84%	0.51	0.15	0.66
2037	0.19	3.12%	0.52	0.16	0.68
2038	0.18	3.44%	0.54	0.16	0.71
2039	0.17	3.78%	0.56	0.17	0.74
2040	2.82	4.12%	9.41	2.84	12.26
Total	16.63		18.98	5.73	24.72
Net present value (at 6%)		PhP8.09M			
Benefit-cost ratio (at 6%)		1.49			
Internal rate of return		9.67%			

Table 94. Present value of investment and revenue streams: ex-post scenario

Year	Real Investment (in million PhP)	Adoption Rate	Present Value of Estimated Welfare Gains (2018) (in million PhP)		
			Producer Surplus	Consumer Surplus	Total Surplus
2011	0.62				
2012	1.36	0.08%	0.06	0.02	0.08
2013	1.55	0.16%	0.11	0.03	0.14
2014	1.19	0.22%	0.14	0.04	0.18
2015	0.54	0.29%	0.18	0.05	0.23
2016	0.68	0.35%	0.20	0.06	0.26
2017	0.53	0.43%	0.23	0.07	0.30
2018	0.57	0.51%	0.26	0.08	0.34
2019		0.51%	0.24	0.07	0.32
2020		0.51%	0.23	0.07	0.30
2021		0.51%	0.22	0.07	0.28
2022		0.51%	0.21	0.06	0.27
2023		0.51%	0.19	0.06	0.25
2024		0.51%	0.18	0.06	0.24
2025		0.51%	0.17	0.05	0.22
2026		0.51%	0.16	0.05	0.21
2027		0.51%	0.15	0.05	0.20
2028		0.51%	0.14	0.04	0.19
2029		0.51%	0.14	0.04	0.18
2030		0.51%	0.13	0.04	0.17
2031		0.51%	0.12	0.04	0.16
2032		0.51%	0.11	0.03	0.15
2033		0.51%	0.11	0.03	0.14
2034		0.51%	0.10	0.03	0.13
2035		0.51%	0.10	0.03	0.13
2036		0.51%	0.09	0.03	0.12
2037		0.51%	0.09	0.03	0.11
2038		0.51%	0.08	0.02	0.11
2039		0.51%	0.08	0.02	0.10
2040		0.51%	1.27	0.38	1.65
Total	7.05		5.49	1.66	7.15
Net present value (at 6%)		PhP0.10M			
Benefit-cost ratio (at 6%)		1.01			
Internal rate of return		6.00%			

Table 95. Financial indicators for four scenarios

Financial Indicator	Scenario			
	Baseline	Ex-post	Smaller *k*	Increased Real Input Costs
Net present value	PhP8.09M	PhP0.10M	PhP3.02M	PhP4.76M
Benefit-cost ratio	1.49	1.01	1.18	1.24
Internal rate of return	9.67%	6.00%	7.46%	7.91%

4.7 Impact on Production and Market Development of the Livestock Industry

The Livestock Program of DA-RFO8, through the A-PLP, engaged in activities that aimed to develop the livestock industry in Eastern Visayas. These activities involved achieving the two Major Final Outputs of providing: (1) technical support services, and (2) agricultural equipment and facilities. To attain these outputs, the A-PLP implemented the following services and interventions: (a) production support services, (b) marketing development services, (c) extension support, education and training services, (d) research and development, (e) regulatory services, (f) information support services, and (g) policy formulation, planning and advocacy services.

The A-PLP was able to contribute to the development of the production aspects of the livestock industry in Samar Island through provision of services that resulted to emergence of industry benefits. Foremost among these was the provision of AI services in carabao which yielded positive net benefits both at the farm and industry levels. The Male Breeder Loan Program also holds the same potential; however, such did not become evident because of some early implementation issues (e. g. selection of beneficiaries).

There were two other activities of the A-PLP that tended to show indications of providing benefits to the livestock industry in Samar Island. These were the SAIS RED Project and the Animal Infusion and Restocking Program (AIRP). However, these projects were either recently completed (SAIS RED) or on-going (AIRP) during the period of evaluation. Hence, the impacts of these two projects were still not evident.

In terms of market development for the livestock industry in Samar Island, the A-PLP implemented only a very limited number of activities. The main reason was that the scale of livestock production in Samar Island was considered as too small to warrant major market development activities. As it is, almost all of the livestock production in the island were small in scale.

Overall, the A-PLP was not able to meet its target of 5% increase in inventory and 3% increase in volume of production from 2012 to 2016 in Samar Island. In fact, both parameters decreased for all livestock in the island during the period (Table 96). A major reason for the decrease was the losses brought about by calamities, mainly Super Typhoon Yolanda in 2013 and Typhoon Ruby in 2015. These led to considerable livestock losses and damages (Table 97). As such, the benefits/increases brought about by the A-PLP were curtailed by the losses/damages brought about by calamities that occurred during the period. The absence of breeder farms not only in Samar Island but in Region VIII could have also contributed to the decline in both livestock inventory and volume of production.

Table 96. Livestock inventory (head) and volume of production (metric ton) in Samar Island, 2012 and 2016

Parmeter	Livestock Species			
	Carabao	Cattle	Goat	Swine
Inventory				
2012	112,597	6,577	12,126	429,946
2016	93,151	5,999	5,768	349,314
% Decrease	17	9	52	19
Volume of Production				
2012	5,106	780	519	25,114
2016	4,844	648	218	18,286
% Decrease	5	17	58	27

Source of data: PSA (2019)

Table 97. Livestock and poultry damage (head) report due to Super Typhoon Yolanda and Typhoon Ruby in Eastern Samar

Livestock Species	Super Typhoon Yolanda (8 Nov 2013	Typhoon Ruby (14 Jan 2015
Carabao	169	551
Cattle	537	109
Goat	264	131
Swine	6,415	1,186

4.8 Status of Adoption of Delivery Services and Implementation Covenants by DA-RFO8

Under Republic Act 8435 or the Agriculture and Fisheries Modernization Act (AFMA), the Department of Agriculture (DA) is entrusted with the primary responsibility of achieving food security, poverty alleviation and promotion of social security. In Region VIII, the DA-RFO8 through the Livestock Program is mandated to implement livestock and poultry programs and projects in order to boost productivity of farmers. It is done through the provision of logistical, administrative and technical support. In general, program/ project implementation by the DA-RFO8 is facilitated by partnership with Local Government Units (LGUs) following certain guidelines.

One of the major activities of the DA-RFO8 is infusion of new breeder stocks to the communities. This is hoped to boost livestock production and serve as source of stock for farming households. The DA-RFO8 adopts the strategy of providing the LGUs access to resources of the Livestock Program under the Production Support Services Fund following a downloading scheme. Under this scheme, the implementation covenant is covered by a Memorandum of Agreement (MOA) that is executed between the DA-RFO8 (represented by the Regional Executive Director, RED) and the concerned LGU (represented by the Municipal Mayor).

Both parties have specific roles and responsibilities. For its part, the stipulated role of DA-RFO8 include: (1) validation and evaluation of project proposals submitted by the LGUs and approval of those that qualify for funding; (2) downloading/transferring of funds to the LGUs to support project implementation; (3) provision of technical

specifications of animals for procurement and animals shed facilities for construction; and (4) monitoring and evaluation of activities to determine progress of the project and ascertain the proper use of funds. Meanwhile, the LGUs are tasked to perform the following: (1) preparation and submission of livestock-related project proposals to the DA-RFO8 for possible funding; (2) implementation of the approved and funded project proposal; (3) following the technical specification of the animals and housing structure provided by the Livestock Program in the procurement of the breeder stock and establishment of a production center, respectively; (4) administration, management and disbursement of funds in accordance with the government accounting and auditing rules and regulations; (5) submission of progress report and making available all project papers and related documents to authorized DA-RFO8 representative for monitoring and verififcation purposes; (6) submission of Audited Financial Report to DA-RFO8; and (7) refund of any unutilized fund to DA-RFO8.

Both parties have generally performed their respective roles and responsibilities. However, the DA-RFO8 was found weak in monitoring and evaluation of project activities. Despite its provision in the MOA, the task was not generally accomplished. This was attributed to lack of manpower considering the scope of coverage and distance of project sites. For their part, the LGUs usually submitted liquidation report for the funds transferred. Despite the availability of records of type and number of animals procured, names and location of beneficiaries, the LGUs generally failed to submit formal progress reports to the DA-RFO8. On average, only about 10% of the LGU-beneficiaries have complied this requirement.

The importance of timely monitoring and reporting in assuring the proper implementation and success of an endeavor should not be overlooked. Inadequacies in these aspects might have caused a lot of losses and inconveniences to all the stakeholders of the A-PLP. These have led to achievements that were below the expectation. Moreover, lack of these would lead to accumulation of problems that would be difficult to deal with once they are discovered. As such, all stakeholders involved should make sure that they have adequate resources and efforts for these endeavors.

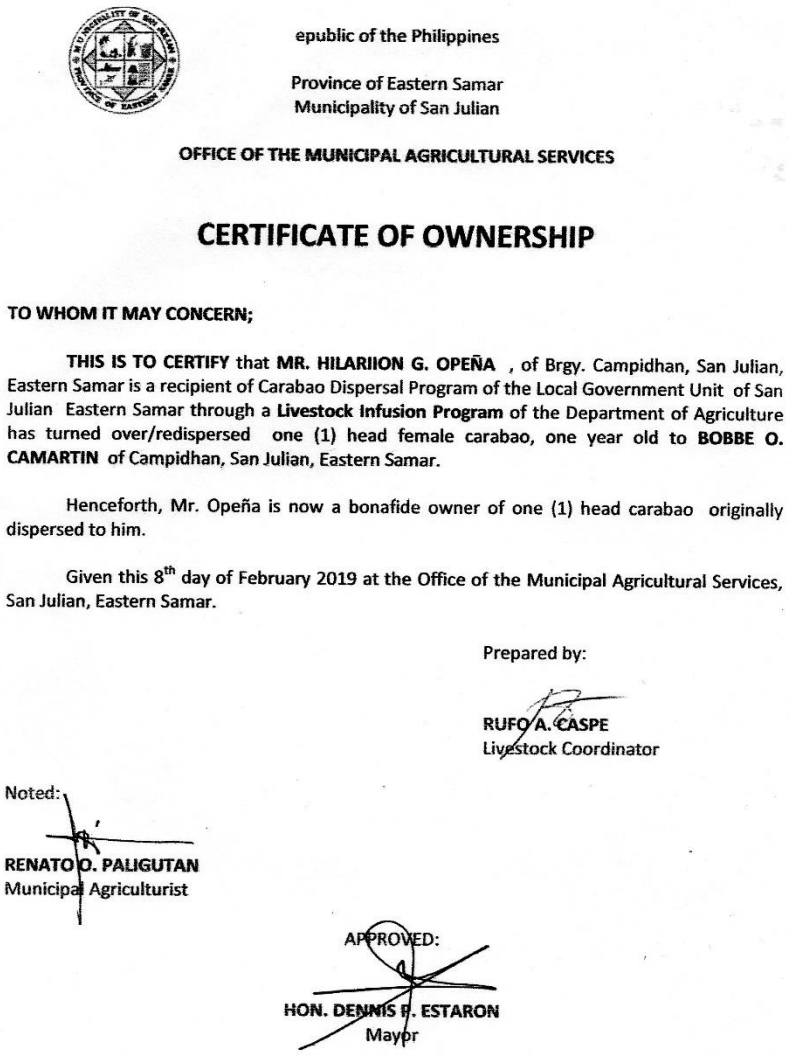
Some problems were also identified in the implementation of the Animal Infusion Program at the LGU level. The major problem encountered was delay in infusing animals due to procurement issues. Another problem was political intervention in the selection of beneficiaries. Following the process of validation and evaluation of proposals for funding by the DA-RFO8 was the identification of possible beneficiaries. These farmers have been identified as capable of raising the animals (given resources and technical knowledge). However, when the animals were already available for distribution/dispersal, they were no longer dispersed to the intended beneficiaries due to intervention by the local politicians. For example, the higher mortality rate of goats infused was reported to be attributed to lack of housing and limited technical knowledge by those who received the animals. In the case of swine, some beneficiaries were also reported to have prematurely sold the animals due to lack of resources for feeds as they struggled between providing food for the family and feed for the animals. As such, project implementors need to establish protocols that would prevent occurrence of these problems.

The infusion of breeder animals to the local communities is covered by an Animal Dispersal Contract (ADC) between the recipients and the concerned Local Chief Executives (LCEs). With regard to big ruminants like carabao and cattle, the ADC stipulates for the insurance of animals. However, this has not been implemented, which is disadvantageous to the government.

As indicated in the ADC, the recipients are required to pay the breeder animals from their offsprings. These are in turn redispersed to other farmers in the locality. As earlier discussed, records of the LGUs involved in the AIRP during the A-PLP show a number of second-generation recipients. Those who have complied were provided a Certificate of Ownership of the animals received (Figure 32). In order to ensure continued success of the dispersal program through the AIRP, regular monitoring should be pursued by the LGUs. Moreover, the DA-RFO8 should require the LGUs to regularly submit progress report about the AIRP and other livestock programs in addition to the animal health report.

Another important Livestock Program is the MBLP. The guidelines stipulate that the intent to avail of a male breeder animal should emanate from the farmer. This is accomplished through a request letter submitted to the Office of the Regional Executive Director (ORED). The request letter is then forwarded to the Livestock Program Coordinator (LPC) who conducts site validation. It is required that the requesting farmer must have at least 10 heads of breedable females and is willing to insure the breeder animal with the Philippine Crop Insurance Corporation (PCIC). If the farmer complies with said requirements, reservation for the animal is done at the Production Center. The availability of desired male breeder animal gives signal for the preparation of release documents. The primary document is an Invoice-Receipt for Property (IRP). The IRP indicates the purpose which is primarily upgrading of the local herd. Moreover, the document also specifies that the male breeder should be integrated into the LGU Animal Dispersal Program, the repayment scheme of which shall be determined by the LGU as the animal becomes its property. The farmer is then informed of the approval of his request and withdraws the breeder animal from the Production Center. The beneficiary affixes his signature in the IRP as proof of receipt of the animal in the presence of the Municipal Agriculturist as witness (also signs the document). The IRP is executed between the Regional Executive Director of DA-RFO8 and the concerned Local Chief Executive/ Municipal Mayor.

As indicated in the IRP, the loaned male breeder animals should form part of the dispersal program of the LGUs. However, the beneficiaries revealed that they did not have any contract indicating responsibilities with regard to the animals received. This means that the concerned LGUs did not process the ADC specific for the male breeder animals directly provided by the DA-RFO8 unlike what they did with the animals which they procured for distribution to farmers. Moreover, the animals were not insured. This defeats the purpose of protecting the animals against death in favor of the LGU/government.



epublic of the Philippines

Province of Eastern Samar
Municipality of San Julian

OFFICE OF THE MUNICIPAL AGRICULTURAL SERVICES

CERTIFICATE OF OWNERSHIP

TO WHOM IT MAY CONCERN;

THIS IS TO CERTIFY that **MR. HILARIION G. OPEÑA** , of Brgy. Campidhan, San Julian, Eastern Samar is a recipient of Carabao Dispersal Program of the Local Government Unit of San Julian Eastern Samar through a **Livestock Infusion Program** of the Department of Agriculture has turned over/redispersed one (1) head female carabao, one year old to **BOBBE O. CAMARTIN** of Campidhan, San Julian, Eastern Samar.

Henceforth, Mr. Opeña is now a bonafide owner of one (1) head carabao originally dispersed to him.

Given this 8th day of February 2019 at the Office of the Municipal Agricultural Services, San Julian, Eastern Samar.

Prepared by:

RUFO A. CASPE
Livestock Coordinator

Noted:

RENATO O. PALIGUTAN
Municipal Agriculturist

APPROVED:

HON. DENNIS P. ESTARON
Mayor

Figure 32. Sample Certificate of Ownership

In the case of the Unified National Artificial Insemination Program (UNAIP), the DA-RFO8 as well as other stakeholders did not also enter into a Memorandum of Agreement (MOA) for the implementation of the program. As such, involvement of stakeholders in the UNAIP activities was mostly based on the presence of an enthusiastic stakeholder/personnel. While this is appreciable, it could not guarantee sustainability of the activities. As such, there is a need for all stakeholders to devote resources to establish formal agreements and commitments among partner entities and assure sustainability of the endeavors.

Aside from AIRP, MBLP and UNAIP, the DA-RFO8 also forged partnership with LGUs and other entities in the conduct of Research and Development (R&D) projects. During the period of A-PLP, the DA-RFO8 implemented the Samar Island Small Ruminant Rural Enterprise Development (SAIS RED) project involving goat raisers across the three provinces. The project was a multi-agency undertaking that involved three Provincial LGUs, three (3) City LGUs, eight Municipal LGUs, and three state universities across Samar Island. Moreover, it was participated in by the

Agricultural Training Institute (ATI), Regional Agricultural and Fishery Council (RAFC), and three private organizations.

The roles and responsibilities of all the entities involved in the implementation of the SAIS RED project were stipulated in the MOA that was executed between and among representatives. As revealed by the project implementing team, all the entities involved complied to their responsibilities. The project was completed within the time frame.

4.9 Effectiveness of DA-RFO8 in Undertaking Joint Investments, Market-Oriented Infrastructure and Upgraded Livestock Technology Projects with LGUs and Private Companies

The main partners of the DA-RFO8 in implementing the A-PLP were the Local Government Units (LGUs) at the provincial, city or municipal level. Being involved with these LGUs-agriculture/veterinary offices in many continuing projects, the DA-RFO8 has acquired considerable skill in partnering with these entities. However, there were instances when potential problems with sustainability would arise. This could be exemplified by cases when a new project has to be established which requires counterpart resources that can only be approved by the LGU Council and Chief Executives. In most cases, the DA-RFO8 presents and gets approval of the proposal to the concerned Council. However, problems sometimes occur when a different set of LGU officials get elected later in the implementation of long-term projects. Mainly because of the considerable number of LGUs that the DA-RFO8 is covering in the region, there is a need to devote considerable resources in assuring sustainability of partnerships.

During the A-PLP, the DA-RFO8 had very limited engagement involving private entities. Its most evident undertaking that involved private companies in Samar Island was SAIS RED. It partnered with the Alaminos Dairy Goat Farm from Alaminos, Laguna which served as source of technologies, quality genetics of goats and forage planting materials for improved pasture and nutrition of animals. It also involved the Heifer International – Philippines (HEIFER-PHIL) and the Philippine Business for Social Progress (PBSP). These agencies provided financial support and technical assistance inluding training modules for the Social Preparation (Values Re-orientation) and Capacity Building (Training of Trainors and Seminars) of community facilitators and farmer-partners. The partnership of the DA-RFO8 with said private entities was effective.

In terms of market-oriented infrastructure, the DA-RFO8 was able to provide three LGUs with digital weighing scale. However, DA-RFO8 was not able to evaluate and influence the LGU on matters related to assuring that the planned infrastructure was functional after provision. This was exemplified in the case of LGU-Calbayog which situated its slaughter house in an unsuitable area. As a result, the digital weighing scale provided by DA-RFO8 through the A-PLP was rendered non-functional.

CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The A-PLP addressed the issue of ensuring food security through the implementation of three component programs, namely: (1) production support services, (2) research and development (R & D), and (3) animal infusion and restocking of multiplier facilities. The first two aimed to address MFO2 (Technical Support Services), while the last component program aimed to address MFO5 (provision of agricultural equipment and facilities).

The production support services has addressed the issue of food security by improving productivity of existing livestock through genetic improvement and production farm development activities. Genetic improvement activities involved two practical methods for improving production potential among livestock, namely through: (1) natural breeding through the Male Breeder Loan Program (MBLP), and (2) artificial breeding through the Unified Artificial Insemination Program (UNAIP). Natural breeding was intended to enable cheaper and faster rates of genetic improvement and animal reproduction within a locality. On the other hand, AI addressed the need for cheaper method of infusing superior genetic material to areas where transfer of live male breeders is difficult and/or expensive. Meanwhile, the production farm development through the Livestock Production Centers (LPCs) has served to assure sustained availability of quality breeder animals and AI skills (through the farm workers taking the lead in AI services provision and capability building of local technicians). The production farms have also served as vital sources of planting materials for pasture development, which was undertaken to assure availability of adequate feed to support increased animal number and production potential.

Among the component activities of production support services, the UNAIP in carabaos demonstrated significant positive impact on farmers' productivity and income. Such impact was also recognized by the carabao raisers as a significant change brought about by the project. AI enabled increase in productivity of individual carabaos. This indicates that the AI activity improved efficiency of farm and household resource utilization. Despite the low adoption and success rates of AI due to inadequate participation of stakeholders, the UNAIP has been a profitable investment in Samar Island. On the other hand, the MBLP was not able to demonstrate considerable impact due to some implementation issues.

The SAIS RED R&D activity has been a modality that likewise helped address food security issues by building up entrepreneurial capability among goat raisers. The project has enabled the goat raisers to increase the number of animals raised in their farms. It has also started to demonstrate improvement in productivity and competitiveness of livestock farmers in Samar Island. Moreover, it has demonstrated improvement in capability of goat raisers both in terms of production and entrepreneurial skills.

Moreover, the Animal Infusion and Restocking Program has addressed food security by providing replacement animals after the massive animal losses brought about by a major calamity that affected Samar island (Typhoon Haiyan). This activity of the A-

PLP has enabled significant increase in net income from swine production of farmers. Such increased income was considered a significant change experienced by the swine raisers.

Meanwhile, the A-PLP has provided limited activities to support market development and competitiveness of livestock farmers in Samar Island. The main reason was that the scale of livestock production in the island was still low (almost totally backyard or subsistence). In this case, the most appropriate intervention was to first increase the scale of production, coupled with a few relevant market development activities. The A-PLP has provided market-oriented infrastructure in terms of digital weighing scales to help raisers obtain a fair market value of their animals. However, inadequacy of support mechanisms for the proper utilization of the weighing scales was experienced, hence effectiveness of said infrastructure has not been fully demonstrated. Addressing these would provide considerable impact to this intervention, and serve as preparation/transition point for the increased scale in production.

On the other hand, the animal health program needs to be more responsive to emerging issues and problems. The program was successful in maintaining the FMD-free status in the island. However, it was not able to demonstrate impact on mortality and morbidity rates due to other diseases.

On the aspect of capability development for Agricultural Extension Workers, the trainings and incentives for AEWs provided by A-PLP were effective; however, the AEWs felt that the incentives were inadequate.

In terms of capacitation in the delivery of market-oriented and productivity-enhancing services, the A-PLP component programs and activities provided adequate learning opportunities and perspective on the environment as well as the role of DA-RFO8 in agricultural development for Samar island. The A-PLP experience has highlighted the emerging role of DA-RFO8 as a coordinating institution, which requires skills in working with local institutions and partners in agricultural development.

Aside from increasing the productivity and farm income of beneficiaries, the A-PLP activities in Samar Island have also generated social and environmental impacts. The major social impact was in terms of increase in knowledge about livestock raising. On the other hand, environmental impact was limited to improvement in efficiency of feed utilization by better-quality (better growth and milk production potential) animals, which would lead to lesser input waste that can become environmental pollutants.

The DA-RFO8 has generally performed its roles and responsibilities in terms of adoption of delivery services and implementation covenants. However, improvement is needed in the monitoring and evaluation of most collaborative undertakings with LGUs. Adequate manpower and skills are required to cater to the scope of coverage and area covered by project sites.

The DA-RFO8 has also demonstrated considerable effectiveness in undertaking joint investments and upgraded livestock technology projects with LGUs and private entities during the A-PLP. Given the diverse environment and circumstances among LGUs and private companies, most of the undertakings still have room for improvement.

A major need is to identify and implement undertakings that have relevance at the local, provincial, regional and national levels.

The A-PLP in Samar Island was able to achieve modest accomplishments in terms of attaining program development objectives, results components and major final outputs. The production support services, SAIS RED R & D, as well as animal infusion and restocking activities have resulted to either increased livestock production and/or improved livestock productivity. Such have contributed to ensuring availability, accessibility and affordability of livestock products. There is considerable potential and need for DA-RFO8 to scale-up/increase the adoption rate of its livestock technologies and activities.

5.2 Recommendations

Based on the findings of the impact evaluation, the following are recommended:

(a) Sustain the operation of the LPCs and provide adequate support (including financial and manpower) to the reactivation of LPCs in Samar Island. This can be made possible with the involvement of the Department of Agriculture Regional Field Office 8 (DA RFO8), the Provincial Local Government Units (PLGUs), Provincial Agricultural Offices (PAOs) and the Provincial Veterinary Offices (PVOs).
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(b) Scale-up adoption and implementation of AI services by involving more stakeholder raisers, LGUs and agencies. This can be done by employing strategies like expanding the reach of advocacy activities to increase the number of stakeholders and coverage area. Clustering of adjacent localities will also enable sharing of fixed resource requirements (e.g. semen storage facilities and equipment, AI technicians), leading to less-cost and more efficient operation. Success rate can also be increased by proper implementation of protocols in the availment of AI services (e.g. follow-up visits). Moreover, there is a need to provide support for recruitment, training and mentoring of more Village-Based AI Technicians (VBAITs). These efforts need the involvement of DA RFO8, Provincial LGUs, City/Municipal LGUs, Barangay LGUs, Provincial/City/Municipal Agriculture Offices, and Provincial/City/Municipal Veterinary Offices as well as agencies like the Philippine Carabao Center (PCC) and the National Dairy Authority (NDA).

(c) Improve the procedure in identifying MBLP beneficiaries and ensure adequate understanding of the roles and responsibilities by the different stakeholders. Adequate monitoring and follow-up support are likewise recommended. These endeavors require involvement of DA RFO8, Provincial LGUs, City/Municipal LGUs, Barangay LGUs, Provincial/City/Municipal Agriculture and Veterinary Offices.

(d) Evolve animal infusion and restocking policies to facilitate procurement of inputs (especially animals) and assure timely as well as proper implementation of the AIRPs. Reviving/reactivation and provision of adequate support to the LPCs in Eastern Visayas will also enhance the timely

availability of animals for infusion. These endeavors will involve the DARFO8, Provincial LGUs, City/Municipal LGUs, Barangay LGUs, Provincial/City/Municipal Agriculture and Veterinary Offices.

(e) Revive and support the organizations formed by the SAIS RED project in their endeavor to evolve innovative goat enterprises and further develop the PECs of their constituent goat raisers. Scaling-up the modality through advocacy efforts aimed at involving more stakeholder raisers, LGUs and other agencies is also recommended. This effort will need the involvement of DARFO8, Provincial LGUs, City/Municipal LGUs, Barangay LGUs, Provincial/City/Municipal Agriculture and Veterinary Offices, as well as National Dairy Authority (NDA).

(f) Evolve appropriate services and activities that support market development and enhance competitiveness of livestock farmers in Samar Island. The existing market development services are apparently geared towards larger production systems. The challenge is to evolve services that would develop market opportunities for smaller-scale production systems. There is also a need to repair the digital weighing scale in Dolores, Eastern Samar and install the unit in Calbayog City. These efforts can involve DA RFO8, Provincial LGUs, City/Municipal LGUs, Department of Trade and Industry (DTI), as well as Provincial/City/Municipal Agriculture and Veterinary Offices.

(g) Increase the involvement of stakeholders to strengthen animal health monitoring system that would enable timely identification of disease/parasite occurrence and appropriate animal health interventions. There is also a need to strengthen advocacy on the prevention and control of common economically important diseases like Foot and Mouth Disease (FMD) and Hemorrhagic Septicemia (Hemosep). Involvement is required from the DA RFO8, Provincial LGUs, City/Municipal LGUs, Barangay LGUs, as well as Provincial/City/Municipal Agriculture and Veterinary Offices.

(h) Sustain the provision of training/capability building for the Agricultural Extension Workers (AEWs). The existing incentive system for AEWs also needs to be improved. These efforts require involvement of DA RFO8, Provincial LGUs, City/Municipal LGUs, Barangay LGUs, as well as Provincial/City/Municipal Agriculture and Veterinary Offices.

(i) The DA-RFO8 needs to invest on manpower and other resources needed to assure adequate monitoring and evaluation of project activities. Moreover, it has to invest on manpower and other resources needed to assure sustainability of partnerships with LGUs. Furthermore, it needs to increase capacity to assume a coordinative role in scaling-up beneficial technologies and activities.

CHAPTER VI

REFERENCES CITED

Alimbuyuguen M.M. & Julian C.B. 2011. Impact of the Techno Gabay Program in selected municipalities of Ilocos Region. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Alston J. M., Norton G. W., and Pardey P. G. 1995. Science under scarcity: Principles and practice for agricultural research evaluation and priority setting. Cornell University Press: Ithaca and London.

Apolinares R, J. V., Digal L. N., and Sarmiento J. M. P. 2013. Determining the market potential of livestock and poultry in the Philippines: An Application of the Almost Ideal Demand System. Retrieved from http://nap.psa.gov.ph/ru11/MSC/pdf%20of%20papers/apolinares.pdf on 18 June 2019.

Aquino A.P., Ani P.A.B. & Bandoles G.G. 2011. Impact of the Techno Gabay Program on farm-level production of selected crops in selected municipalities of the Philippines. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Aveno J.L., Galang L.M., Battad T.T., Orden M.E.M., & Suyat J.R. 2011. Impact of the Techno Gabay Program in selected municipalities of Central Luzon. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Baltenweck I. and Galie A. 2015. Livestock, Livelihoods, Gender and Food Security. Paper presented at the Seminar on Sustainable Rural Development for Food Security and Nutrition, including the role of Livestock for the Committee on World Food Security High Level Panel of Experts on Food Security and Nutrition, Nairobi, Kenya, May 8, 2015.

Bayacag P.G., Bayacag J.C., Aquino A.P., & Ani P.A.B. 2011. Impact of the Techno Gabay Program on 'Cardaba' banana and mango farms in selected municipalities of Southern Mindanao. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Briones R. M. 2015. Impact assessment of national and regional policies using the Philippine Regional General Equilibrium Model. *The Philippine Review of Economics , LII* (1), 45-76.

Briones R. M. 2013. Impact assessment of the Agricultural Production Support Services of the DA on the income of poor farmers/fisherfolk: Review of the evidence. *Philippine Institure for Development Studies (PIDS) Discussion Paper Series No. 2013-23*.

Briones R. M. & Galang I. M. 2012. Assessment of prospective impact of fruits and vegetables research at the industry level in the Philippines: the Case of the ACIAR-PCAARRD Horticulture Project. *Philippine Institute for Development Studies (PIDS) Discussion Paper Series No. 2012-40*.

Centes A., Ruales J., Soria R.J, & Seriño M.N.V. 2017. Factors affecting profitability of small-scale vegetable production in the Visayas. *Annals of Tropical Research* Vol. 39 (Supplement).

Corong E., Dacuycuy L., Reyes R., & Taningco A. 2012. The growth and distributive impacts of public infrastructure investments in the Philippines. *Partnership for Economic Policy (PEP) Working Paper 2012-15*.

Davis J., Gordon J., Pearce D. & Templeton D. 2008. Guidelines for assessing the impacts of ACIAR's Research activities. *Impact Assessment Series 58*. Canberra: Australian Center for International Agricultural Research.

FAO. 2009. The State of Food and Agriculture. Food and Agriculture Organization of the United Nations. Retrieved on 19 April 2018 from http://www.fao.org/docrep/012/i0680e/i0680e.pdf.

Francisco S. R., Mangabat M. C., Mataia A. B., Acda M. A., Kagaoan C. V., Laguna J. P., Ramos M., Garabiag K. A., Paguia F. L., and Mullen J. D. 2009. Integrated management of insect pests of stored grain in the Philippines. ACIAR Impact Assessment Series Report No. 62. Australian Centre for International Agricultural Research: Canberra. 45pp.

Gabunada F. M., Zapata N. R. Jr., Tambis M. M., Amestoso N. T., Bulayog M. S. B., Lambert B. C., Anwar S. B., and Recto A. L. M. 2019. Impact assessment of PCAARRD's Science and Technology-Based Farm (STBF) Technology Transfer Modality in the Visayas. Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, Los Baños, Laguna and Visayas State University, Baybay City, Leyte.

Gabunada F. M., Patindol R. A., Cagasan E. G., Anwar S. B., & Recto A. L. M. 2015. Farm-level impact of the National Corn-Based Farmer-Scientists Research, Development and Extension Training Program (FSTP). Department of Agriculture – Agricultural Training Institute and Visayas State University.

Gabunada F. M., Tambis M. M., Jocson T. B., Saz E. B. & Anwar S. B. 2014. Impact assessment of DOST-UNDP GAINEX project on promotion of environmentally-sound aquaculture techniques for shrimp/prawn. Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, Los Baños, Laguna and Visayas State University, Baybay City, Leyte.

Gabunada F. M., Anwar S. B., Aquino A. P., & Ani P. A. B. 2011. Impact of the Techno Gabay Program on palay farms in selected municipalities of Leyte, Eastern Visayas. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A. P. Aquino, E. O. Brown, and D. C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Gabunada F. M., Patindol T. A., Armenia P. T., Nuñez L. B., Centino Z. M. H. & Anwar S. B. 2011. Impact assessment of the bamboo demonstration and pilot application of technology packages and production sytems project in Iloilo. Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, Los Baños, Laguna and Visayas State University, Baybay City, Leyte.

Gertler P. J., Martinez S., Premand P., Rawlings L. B., & Vermeersch C. M. 2016. *Impact evaluation in practice* (Second ed.). Washington, DC: The World Bank and Inter-American Development Bank.

HLPE. 2016. Sustainable Agricultural Development for Food Security and Nutrition: What Roles for livestock? A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

Klasen S., Lechtenfeld T., Meier K., & Rieckmann J. 2011. Impact evaluation report: Water supply and sanitation in rovincial towns in Yemen. Courant Research Centre Discussion Papers No. 102. Göttingen University, Germany.

Kondo T., Orbeta A. J., Dingcong C., & Infantado C. 2008. Impact of microfinance on rural households in the Philippines. *Philippine Institute for Development Studies (PIDS) Discussion Paper Series No. 2008-05*.

Laureto A.S., Angcos L.R., Dinampo E.E., and Rivera T.A. 2011. Impact of the Techno Gabay Program on corn farms in Claveria, Misamis Oriental, Northern Mindanao. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Mascariñas A.M., Amano V.L., Mascariñas M.J.B., Cortez Jr. C.V., and Candelaria A.P. 2011. Impact of the Techno Gabay Program on abaca production in selected municipalities of Catanduanes, Bicol. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Mendola M. 2007. Agricultural technology adoption and poverty reduction: A propensity-score matching analysis for rural Bangladesh. *Food Policy* 32, pp 372-393.

Montes N. D., Zapata Jr N. R., Alo A. M. P., and Mullen J. D. 2008. Management of internal parasites in goats in the Philippines. ACIAR Impact Assessment Series Report No. 57, 44pp.

Mutuc M. E., Rejesus R. M., Pan S., & Yorobe J. J. 2012. Impact assessment of Bt corn adoption in the Philippines. *Journal of Agricultural and Applied Economics , 44* (1), 117-135.

Narvaez T. A. and Narvaez J. L. A. 2011. Impact of the Techno Gabay Program on palay farms in selected municipalities of Western Mindanao. In: *The Farm-level Impact f the Techno Gabay Program: Assessment, Evidence, and Implications* (Eds: A.P. Aquino, E.O. Brown, and D.C. Cardenas). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, Los Baños, Laguna.

Orden M. E. M., Porciuncula F. L., Aveno J. L., Orden E. A., Domingo I. J., Rafael P. J. Jr., Zapata N. R., Del Rosario N. A., Parayno R. S., Francisco B. E., and Corales R. M. 2013. Impact Assessment of the Carabao Development Program of the Philippine Carabao Center. Central Luzon State University, Muños, Nueva Ecija.

Parente S. and Van de Weerd H. 2012. Food Security and Farm Animal Welfare. Based on a Report by Karl-Heinz Erb, Andreas Mayer, Thomas Kastner, Kristine-Elena Sallet, Helmut Haberl (2012). The Impact of Industrial Grain Fed Livestock Production on Food Security: An Extended Literature Review. Institute of Social Ecology, Vienna, Austria.

PSA. 2010. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202010.pdf.

PSA. 2011. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202011.pdf

PSA. 2012. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202012.pdf

PSA. 2013. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202013.pdf

PSA. 2014. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202014.pdf

PSA. 2015. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202015.pdf

PSA. 2016. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202016.pdf.

PSA. 2017. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 19 April 2018 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202017.pdf

PSA. 2018. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 29 April 2019 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202018.pdf

PSA. 2019. Selected Statistics on Agriculture. Philippine Statistics Authority, East Avenue, Diliman, Quezon City. Retrieved on 12 February 2020 from https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202019.pdf

Rejesus R. M., Palis F. G., Rodriguez D. G. P., Lampayan R. M. & Bouman B. A. M. 2011. Impact of the alternate wetting and drying (AWD) water-saving irrigation technique: Evidence from rice producers in the Philippines. *Food Policy* 36: 280-288.

Reyes C., Sobrevinas A., Bancolita J., & de Jesus J. 2009. Analysis of the impact of changes in the price of rice and fuel on poverty in the Philippines. *Philippine Institute for Development Studies (PIDS) Discussion Paper Series No. 2009-07*.

Rogers P., Hawkins A., McDonald B., Macfarlan A. & Milne C. 2015. Choosing appropriate designs and methods for impact evaluation. Department of Industry, Innovation and Science Report. Canberra, Australia.

Rosenbaum P. & Rubin D. 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, pp.41-55.

Sinclair K. M. 2014. Food Security and Livestock Production Among Haitian Smallholder Farmers. Master of Science Thesis, School of Dietetics and Human Nutrition, McGill University, Montreal.

Sobreviñas A. B., & Barrios E. B. 2010. Impact of the rice trade policy reforms on household welfare in the Philippines. *Philippine Journal of Development , XXXVII* (1), 15-39.

Sutherland, K.A. and Leech, S.M. 2007. Increasing the effectiveness of conservation in British Columbia through the use of Extension. Paper presented in the Monitoring the Effectiveness of Biological Conservation Conference, 2-4 November 2004, Richmond, B.C. Retrieved on November 14, 2007 from http://www.forres.org/events/mebc/papers.html.

Tutor M. V. 2014). The impact of Philippines' conditional cash transfer program on consuption. *The Philippine Review of Economics , LI* (1), 117-161.

Vista A., Cororaton C. B., Inocencio A. B., Tiongco M. M., & Manalang A. B. 2016. Impact assessment of the National Greening Program of the DENR: Scoping or process evaluation phase (Economic Component). *Philippine Institute for Development Studies (PIDS) Discussion Paper Series No. 2016-27*

Yorobe J. M. & Smale M. 2012. Impacts of Bt maize on smallholder income in the Philippines. *AgBioForum* 15(2): 152-162.

Yorobe J. M., Rejesus R. M. & Hammig M. D. 2011. Insecticide use impacts of Integrated Pest Management (IPM) farmer field schools: Evidence from onion farmers in the Philippines. *Agricultural Systems* 104: 580–587.

Zapata N. R. Jr., Bathan B. M., Manipol N. E. P., Montemayor G. J. S., and Reyes C. A. A. 2014. Impact assessment of the Rural Enterprise Development (RED) Through Innovative Goat Production System Project Phase 1. Terminal Report. University pf the Philippines Los Baños and Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development – Department of Science and Technology, Los Baños, Laguna.

ANNEXES

Annex 1. The Project Evaluation Team

Role	Name	Education	Specialization
Team Leader	Fe M. Gabunada	PhD in Agricultural Economics	Production Economics; Impact Evaluation
Survey Specialist	Marlon M. Tambis	MS in Agricultural Economics	Agricultural Economics
Technical Expert	Francisco G. Gabunada, Jr.	MS in Animal Science	Animal Production; Animal Health; Participatory Technology Development
	Editha G. Cagasan	PhD in Development Communication	Development Journalism; Participatory M&E
Statistician	Moises Neil V. Seriño	PhD in Economics	Econometrics; Development Economics
Research Assistant	Nymphmary Daphne S. Santiago	BS in Economics	Economics
	Danica R. Acebedo	BS in Development Communication	Development Communication

Annex 2. Questionnaire for the UNAIP

CONFIDENTIALITY: The Interviewer takes the responsibility in guarding the confidentiality of all the information generated through this instrument.	**IMPACT EVALUATION OF THE AGRI-PINOY LIVESTOCK PROGRAM (A-PLP) – Unified Artificial Insemination Program**

ID:		Enumerator:	Coordinator:
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 Agri-Pinoy Livestock Program (A-PLP) which was implemented by the Department of Agriculture RFO8 and Local Government Unit (LGU) in your area. Your household has been randomly selected as respondent to represent the Unified Artificial Insemination Program (beneficiaries/non-beneficiaries). The information that will be obtained from this survey will provide insights on the outcomes and impacts of the program 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 1: RESPONDENT'S INFORMATION

1.1 Personal Information and Socio-economic Characteristics of Farmers

1.1.1 Type of Respondent: _____ 0 – Non-beneficiary 1 – Beneficiary

For Beneficiary:

1.1.2 Animal Inseminated: _____ 1 – Carabao 2 – Cattle

1.1.3 Date Inseminated: _____

1.1.4 Successful AI? – Nanganak? _____ (1) Yes (2) No

1.1.5 If Yes, Date of Calving (month, year): _____

1.1.6 Sex of Offspring: _____ 1 – Male 2 – Female

1.2 Household Address

1.2.1 Purok/Sitio : _____ 1.2.2 Barangay : _____

1.2.3 unicipality : _____ 1.2.4 Province : _____

1.3 Name of Respondent

1.3.1 First Name : _____

1.3.2 Middle Name : _____

1.3.3 Last Name : _____

1.4 Age : _____

1.5 Gender : _____ (1 – Male; 2 – Female)

1.6 Civil Status : _____ (1- Single; 2 – Married; 3 – Widowed; 4 – Separated/Divorce; 5 – Live-in)

1.7 Number of years in school : _____(please refer to code for Education (**13**) found on page 2 for the household profile)

1.8 Contact Number : _____

SECTION II. HOUSEHOLD CHARACTERISTICS

2.1 Household Profile

2.1.1	2.1.2	2.1.3	2.1.4	2.1.5	2.1.6	2.1.7	2.1.8	2.1.9	2.1.10
Who are the members of this household? (list in this order) Family Name, First Name	Relationship to Household Head	Age	Sex	Civil Status	Education	Presently Attending School?	Type of School	Occupation	
								Primary	Secondary
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
10.									

Codes to Relationship to HH (2.1.2)

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
96 – Other Relative

Codes to Sex (2.1.4)
1 – Male
2 – Female

Codes for Education (2.1.6)

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 (2.1.9/2.1.10)

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) _____

Code to Civil Status (2.1.5)

1 – Single
2 – Married
3 – Widowed
4 – Separated/Divorce
5 – Live-in

Code to Attending School (2.1.7)

0 – No
1 – Yes

Code to Type of School (2.1.8)

1 – Public
2 – Private

2.2 Income and Employment Profile *(For non-beneficiaries, please proceed to questions 2.2.2 and 2.2.4)*

2.2.0	2.2.1	2.2.2	2.2.3	2.2.4
Sources of Income	Number of Members in the Family Who are Involved		Estimated Income per Year Earnings/ Income	
	Before AI	2017	Before AI	2017
Farm Income				
Carabao				
Bull/Cow/Cattle				

Goat				
Sheep				
Buck				
Pig				
Poultry				
Rice				
Coconut				

Table 2.2 continued. . .

2.2.0	2.2.1	2.2.2	2.2.3	2.2.4
Sources of Income	Number of Members in the Family Who are Involved		Estimated Income per Year Earnings/ Income	
	Before AI	2017	Before AI	2017
Vegetables				
Root crops				
Banana				
Others (specify)				
Sub-Total (to be computed)				
Off-farm Income				
Planting				
Plowing				
Weeding				
Other, specify _____				
Sub-Total (to be computed)				
Non-farm Income:				
Sub-Total (to be computed)				
Other sources:				
Sub-Total (to be computed)				
TOTAL (to be computed)				

Code to Non-farm Income:
1 – Salaried employment in private sector
2 – Salaried employment in government
3 – Honorarium
4 – Business (sari-sari store, etc.)
5 – Fishing

Code to Other Sources:
1 – Remittance received (Domestic & Foreign)
2 – Pension, retirement & other similar benefits
3 – Assistance from a government welfare program (e.g., CCT, 4Ps)
4 – Assistance from government officials
5 – Assistance from relatives and friends
6 – Prizes received (raffle, gambling, etc.)

2.3 Information on Dwelling Place (for Non-Beneficiaries, please answer only PRESENT Rows)

2.3.1	2.3.2	2.3.3	2.3.4	2.3.5	2.3.6	2.3.7
Period	House Ownership	Toilet Facility	Water Supply	Uses of Water	Distance from the House of the Water Source (meter)	Description of dwelling place
Before AI						
Present						

Code for House Ownership (2.3.2)	Codes for Toilet Facility (2.3.3)	Codes for Water Supply (2.3.4)	Codes for Uses of Water (2.3.5)
1 – Owned	1 – Flush	1 – Private water connection/piped-in	1 – Drinking only
2 – Rented	2 – Pour	2 – Water pipes/tanks provide by the government and other groups	2 – Cooking only
3 – Living with others	3 – Antipolo type	3 – Refilling Station	3 – Domestic used only
96 – Others, (specify)_____	4 – None	4 – Mineral Water from Stores	4 – Drinking & Cooking
	96 – Others (specify)_____	5 – Spring Water (Tubod)	5 – Drinking, cooking, and domestic used
		6 – Rain Water	
		7 – Well water (Tabay)	

2.4 Household/ Farm Assets and Vehicles

2.4.0	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5
Code	Name of Item	Qty	Value (Purchase price in PhP)	Year purchased	Where did you obtain the money used to buy this item?
Household Assets					
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				
12	Other, specify				
Farm and Livestock Assets					
13	Plow				
14	Tractor				
15	Water pump				
16	Carabao				
17	Cattle				
18	Goat				
19	Sheep				
20	Other, specify				
Vehicles					
21	Bicycle				
22	Pedicab				
23	Motorcycle or Scooter				
24	Tricycle				
25	Car/Jeep				
26	Pick-up/Truck				
27	Pumpboat				
28	Non-motorized Banca				
29	Others, specify				

SECTION III. FARM AND ENTERPRISE CHARACTERISTICS

3.1. Ilang taon ka nang nag-aalaga ng hayop? (Number of years in livestock raising): _____

3.2. Ilang taon ka nang nag-aalaga ng kalabaw/ baka (hayop na na-AI) (Number of years in raising animal species that has been inseminated) : _____

3.3. Kabuuang laki ng sakahan (Total farm area) (ha) : _____

3.4. Kabuuang lugar na ginagamit para sa pag-aalaga ng kalabaw/ baka (hayop na na-AI) (Total area used for raising species being inseminated / AI'd) (ha) : _____

3.4.1 Land ownership:

1 – Owner 2 – Leaseholder 3 – Tenant 4 – Other, specify _____

3.5. Kabuuang lugar ng pastulan ng kalabaw/ baka (animal species AI'd) (Total pasture/grazing area) for carabao/ cattle (species of AI'd animal), ha. For non-beneficiaries, answer only "At Present."

3.5.1 Before availing AI : _____

3.5.2 At Present : _____

3.6 Infrastructural Distance and Accessibility

3.6.0	3.6.1	3.6.2	3.6.3
Lokasyon (Location)	Distance (km)	(Dominant Mode of Transportation)	(Dominant Type of Road)
Sakahan papunta sa pinakamalapit na kalsada (Farm to nearest road)			
Sakahan papuntang paninirahan (Farm to residence)			
Sakahan papuntang merkado (Farm to output market)			
Sakahan papuntang bilihan ng inputs (Farm to inputs supply)			

Code to Mode of Transportation (3.6.2)

1 – Maglakad (Walk)
2 – Pagsakay sa mga hayop (Riding animals e.g: horse, cow or carbao)
3 – Bisikleta (Bicycle)
4 – Motorsiklo/Tricycle (Motorcycle/Tricycle)
5 – Public Bus/Jeepney
6 – Sarling sasakyan (Own vehicle)
96 – Iba pa Other, (Specify) _____

Code to Type of Road (3.6.3)

1 – Sukal na daan (Dirt road)
2 – Kaskaho na daan/Lahat ng panahon (Gravel/All-weather)
3 – Aspalto (Asphalt)
4 – Kongkreto (Concrete)
96 – Iba pa (tukuyin) Other (specify): ___

3.7.0 Purpose of Raising _____ (Species being Inseminated or AI'd) For non-beneficiaries, answer only questions (3.73) and (3.74).

3.7.1	3.7.2	3.7.3	3.7.4
Purpose/s of raising _____? Before availing AI	Importance Rank	Purpose/s of raising _____? Present/ After Availing AI	Importance Rank

3.8.0 Livestock Inventory, Mortality and Morbidity in BEFORE AI and AFTER AI (ONLY FOR SPECIES THAT AVAILED OF AI SERVICES) For non-beneficiaries, answer questions in 2017 only.

3.8.1	3.8.2	3.8.3	3.8.4	3.8.5	3.8.6	3.8.7	3.8.8	3.8.9	3.9.0	3.9.1	3.9.2	3.9.3	3.9.4	3.9.5	3.9.6	3.9.7
Animal Type	BEFORE AVAILING AI								AFTER AVAILING AI/ 2017							
	No. of Head	Acquisition Cost/ Value	Breed	Source	No. of Death	Mortality (%) (to be computed)	No. of Sick Animals	Morbidity (%) (to be computed)	No. of Head	Acquisition Cost/ Value	Breed	Source	No. of Death	Mortality (%) (to be computed)	No. of Sick Animals	Morbidity (%) (to be computed)
Sexually Mature Female Male																
Young Female Male																
Other, specify																

Code to Source (3.8.5/3.9.3):

1 – Own produce
2 – Bought
3 – Barter
4 – Given
5 – Availed for a loan
6 – Dispersal
96 – Other, specify _____

Code to Breed (3.8.4/3.9.2):

1 – Native
2 – Crossbred
3 – Purebred

3.9.0 Investments made for _____ (SPECIES INSEMINATED) production

3.9.1	3.9.2	3.9.3	3.9.4	3.9.5	3.9.6
Items	Description	Total Cost	Year Established/ Acquired	Estimated Life Span	Source of Capital*
Housing (materials and labor)					
Foundation Stock – Female breeder animal				-99	
Foundation Stock – Male breeder animal				-99	
Perimeter fence (barb wire and fence post)					
Tools and equipment					
Pasture development (including cost of planting materials, labor and other costs of establishment)				-99	
Other, specify _____					

Code to Source of Capital (3.9.6):
1 – Owned 2 – Borrowed 3 – Grant

3.9.7 Annual depreciation cost (to be computed):

SECTION IV. AI PROGRAM SCENARIO

A. Before AI Scenario (NOTE: If respondent is a BENEFICIARY, start each question with "BEFORE THE AI PROGRAM")

4.1. If you do not have a carabull/ bull (APPLICABLE ANIMAL), where do you breed your female animals? _____

1 – In the barangay 2 – Other barangay 3 – Other towns
4 – Loaned male breeder 96 – Other, specify _____

4.2. Distance of the location of BREEDER MALE (ANIMAL SPECIES INSEMINATED) used in breeding your female animal? _____(in km)

4.3. What breed was the (MALE OF THE ANIMAL SPECIES INSEMINATED) used in breeding your female animal? _____

1 – Native, 2 – Crossbred, 3 – Purebred
4 – Loaned Male Breeder 96 – Other, specify: _____

4.4. How easy/ difficult is it to look for BREEDER BULL/CARABULL (ANIMAL SPECIES INSEMINATED)? _____

1 – Very easy 2 – Easy 3 – Difficult 4 – Very difficult

4.5. How many matings does it normally take before your female animal becomes pregnant? _____

4.6. Are you required to pay for male breeding animal services (encircle)? _____

0 – No 1 – Yes

4.6.1 If YES, how much? PhP_____

4.6.2 If YES, what are the conditions (*e.g* one-time payment until animal is pregnant, when will the female animal owner pay – e.g. after animal is sure to be pregnant or after birth)? _____
_____
_____

4.7. How do you determine whether a caracow/ cow (APPLICABLE ANIMAL) was matured enough for breeding? _____
_____
_____

4.8. How do you determine whether a caracow/ cow (APPLICABLE ANIMAL) was in heat? _____
_____
_____

FOR NON-BENEFICIARIES ONLY:

4.9. Have you heard about the availability of artificial insemination (AI) services in your area? _____ 0 – No 1 – Yes

4.9.1. If YES, FROM WHOM did you hear about the availability of AI services in your area? _____

1 – DA Technician 2 – PCC Technician 3 – Other Farmers
96 – Other, specify _____

4.9.2. If YES WHEN did you hear about the availability of AI services in your area (Year)? _____

4.9.3. If YES, what are the benefits from AI that you know? (MULTIPLE RESPONSE ACCEPTABLE) Encircle

(1) – Cheaper than natural breeding/normal mating
(2) – Will result to larger offspring
(3) – Higher price of offspring
(4) – Higher milk production
(5) – Higher income from offspring when used for draft
(6) – Higher income from milk
(7) – None
96 – Other, specify _____

4.9.4. If YES, why did you not avail of the AI service? (ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE)

1 – I could not afford the payment for the AI service
2 – I could not reach the AI technician at the time when my caracow/cow was in heat
3 – At the time when the AI service availability was announced, my caracow/cow was not yet ready for breeding
4 – I do not know how to determine if my caracow/ cow is ready for AI
5 – I am afraid that AI will result to injury/disease on my animals
96 – Other, specify _____

4.10. If there is another opportunity for AI service in your area, would you avail of it? 0 – No 1 – Yes

4.10.1. If YES, under what conditions would you agree to avail of the AI service (MULTIPLE RESPONSE ACCEPTABLE):

1 – availability of training on determination of heat and related information
2 – AI service must be free of charge
96 – Other, specify: _____

AI Program Scenario (For BENEFICIARIES ONLY)

4.11. Animal Species Inseminated:

4.11.1 Species: _____

4.11.2 Breed of Animal Inseminated:

1 – Native 2 – Crossbred 3 – Purebred 96 – Other, specify _____

4.11.3 Was the AI service successful (produced a calf)?

0 – No 1 – Yes

4.12. Date of Artificial Insemination BASED ON RECORD (month, year): _____

4.13. From where did you learn about the Artificial Insemination Program? Encircle answer.

1 – DA-LGU 2 – PCC 3 – Neighbors/ friends
4 – Agricultural technician 96 – Other, specify _____

4.14. Agency that facilitated the Artificial Insemination Service. Encircle answer.

1 – DA-LGU 2 – DA-RFU 96 – Others, specify _____

4.15. How was availment of the AI Service initiated? _____

1 – You approached the Agriculture Office/LGU to apply for AI Service
2 – The Agriculture Office/LGU identified and directed you avail of the AI Service
3 – Your association identified and directed you to avail of the AI Service
96 – Others, specify _____

4.16. Describe the process involved in availing of the AI Service for (specify ANIMAL SPECIES):

4.16.1	4.16.2	4.16.3	4.16.4	
Qualifications	Requirements	Procedure	Obligations	
			Repayment	Responsibilities

4.17. Why did you avail of the AI Service? _____
_____

4.18. Were there male breeder animals in your barangay when you availed of the AI Service? 0 – No 1 – Yes

4.18.1. If YES, how many? _____

4.18.2. What breed? _____
1 – Native 2 – Crossbred 3 – Purebred

4.18.3. How much do you have to pay for the breeding service of the male breeder? PhP_____

4.18.4. Why did you avail of AI instead of the male animal breeding service? _____
_____

4.19. How was your animal inseminated? ____
1 – alone 2 – together with other animals (mass AI)

4.20. Was your animal in natural heat when it was inseminated?
___ No, the animal was injected with hormone before insemination to induce heat
___ Yes, the animal was in natural heat during insemination

4.21. If Yes, who discovered that the animal was in natural heat? _____
1 – Farmer or Household Member
2 – AI Technician
3 – Others, specify _____

4.22. Were you required to pay for the AI Service? 0 – No 1 – Yes

4.22.1 If Yes, how much payment was required? PhP_____

4.22.2 If No, did you give monetary remuneration to the AI technician?
0 – No 1 – Yes

4.22.2.1 If Yes, how much did you give? PhP_____

4.23. Details of AI Technician that inseminated your animal:

4.23.1 Name: _____

4.23.2 Type of Technician: _____

1 – PCC 2 – DA-RFU 3 – DA-Provincial LGU
4 – DA-Municipal LGU 5 – Village-Based AI Technician (VBAIT)

4.24. Were you informed on what needs to be done to your animals after the insemination? ____ 0 – No 1 – Yes

4.24.1 If Yes, what were the information given?
(ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE)

1 – Do not stress and use the animal for work
2 – Keep the animal comfortable (adequate feed, water and housing)
3 – AI technician will come back _____
96 – Other, specify _____

4.25. Did the technician visit to check if your animal was pregnant (2-3 months after AI service)? _____ 0 – No 1 – Yes

4.25.1 If Yes, when were you visited (months after AI)? _____

4.26. Were you required to pay for the visit? _____ 0 – No 1 – Yes

4.26.1 If Yes, how much payment was required? PhP_____

4.26.2 If No, did you give monetary remuneration to the AI technician? _____
0 – No 1 – Yes

4.26.3 How much did you give? PhP _____

4.27. Details of AI Technician that visited you after AI:

4.27.1 Name: _____

4.27.2 Type of Technician (Encircle):

1 – PCC 2 – DA-RFU 3 – DA-Provincial LGU
4 – DA-Municipal LGU 5 – Village-Based AI Technician (VBAIT)

4.28. If the technician visited you after the AI service, was your animal diagnosed as pregnant? _____ 0 – No 1 – Yes

4.28.1. If Yes (your animal was pregnant), what information did the technician relay to you regarding the management of the pregnant animal? (ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE)

1 – Do not stress and use the animal for work
2 – Keep the animal comfortable (adequate feed, water and housing)
3 – AI technician will come back _____
4 – The animal is due to give birth on _____
96 – Other, specify _____

4.28.2. If No (animal was not pregnant), did the technician make arrangement for repeat AI? _____ 0 – No 1 – Yes

4.28.3. If Yes, did your female animal get pregnant from the repeat AI?_____ 0 – No 1 – Yes

4.28.4. If Yes, how many repeat AI services were done before your animal got pregnant? _____

4.28.5. Were you required to pay for the visit?_____ 0 – No 1 – Yes

4.28.5.1 If Yes, how much payment was required? PhP_____

4.28.5.2 If No, did you give monetary remuneration to the technician? _____
0 – No 1 – Yes

4.28.5.3 How much did you give? PhP_____

4.29. If your animal was confirmed pregnant through AI, did the technician visit you again after his first visit? _____ 0 – No 1 – Yes

4.29.1. If Yes, how many months after the actual AI did it happen? _____

4.29.2. What information did the AI technician relay to you during the visit? (ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE)

1 – Do not stress and use the animal for work
2 – Keep the animal comfortable (adequate feed, water and housing)
3 – AI technician will come back _____
4 – The animal is due to give birth on _____
5 – Prepare an area for calving
6 – If you need help in facilitating calving call me at _____
96 – Other, specify _____

4.30. Were you required to pay for the visit? _____ 0 – No 1 – Yes

4.30.1 If Yes, how much payment was required? PhP_____

4.30.2 If No, did you give monetary remuneration to the technician? _____
0 – No 1 – Yes

4.30.3 How much did you give? PhP_____

4.31. Details of Technician that visited:

4.31.1 Name: _____

4.31.2 Type of Technician (Encircle):
1 – PCC 2 – DA-RFU 3 – DA-Provincial LGU
4 – DA-Municipal LGU 5 – Village-Based AI Technician (VBAIT)

4.32. If your animal was pregnant through AI, did you call the technician when the animal gave birth? 0 – No 1 – Yes

4.32.1. If Yes, did the technician come? _____ 0 – No 1 – Yes

4.32.2. What assistance did the AI technician provide during the visit? (ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE)

1 – Assisted/ facilitated calving
2 – Cut and disinfected the navel/ chord of the calf
3 – Treated the caracow/ cow (flushing)
96 – Other, specify _____

4.33. Were you informed on what needs to be done to your animals after birth?____ 0 – No 1 – Yes

4.33.1 If Yes, what were the information/ arrangements were given? (ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE)

1 – Calf should suckle from caracow/ cow
2 – Do not bring the cow and calf to risky areas
3 – Do not stress/ work the caracow/ cow
4 – Provide feed and water to caracow/ cow
5 – If there are problems, call me at _____
96 – Other, specify _____

4.34. Were you required to pay for the visit? _____ 0 – No 1 – Yes

4.34.1 If Yes, how much payment was required? PhP_____

4.34.2 If No, did you give monetary remuneration to the AI technician? _____
0 – No 1 – Yes

4.34.3 How much did you give? PhP_____

4.35. Details of the Technician that visited you when the animal gave birth:

4.35.1 Name: _____

4.35.2 Type of Technician (Encircle):
1 – PCC 2 – DA-RFU 3 – DA-Provincial LGU
4 – DA-Municipal LGU 5 – Village-Based AI Technician (VBAIT)

4.36. Details of the offspring produced from AI:

4.36.1. Date of Calving (Month, Year): _____

4.36.2. Sex: _____ 1 – Male 2 – Female

4.37. Were there differences in characteristics of the offspring produced from AI with your other animals? _____ 0 – No 1 – Yes

4.37.1. If Yes, describe the differences (detail and quantify if possible)

4.37.1.1	4.37.1.2	4.37.1.3
Characteristic	Offspring Produced from AI	Owned/ Other Animals
a) Size/ weight		
b) Rate of growth		
c) Temperament/ ease in handling		
d) Does it select what feed to eat? 0 – No 1 – Yes		
e) Amount of feed consumed		

f) Capacity to work as draft animal		
g) Other, specify		

4.38. Did you manage the offspring produced from AI differently compared to your other animals? _____ 0 – No 1 – Yes

4.38.1. If Yes, what were the differences in management?

4.38.1.1	4.38.1.2	4.38.1.3
Management Practice	Offspring Produced from AI	Owned/ Other Animals
Housing		
Feeding		
Breeding		
Health		
Use for Work		

4.39. What benefits did you obtain from availing of the AI Service? (ENCIRLE - MULTIPLE RESPONSE ACCEPTABLE) Please describe and quantify if applicable.

4.39.1	4.39.2
Benefit	Describe and Quantify
a) Cheaper than natural breeding/ normal mating	
b) Bigger offspring	
c) Higher price of offspring	
d) Higher income as draft animal	
e) Higher milk production	
f) Higher income from milk	

4.40. Did you have problems that were inherent only with the offspring from AI, and NOT with your other animals? _____ 0 – No 1 – Yes

4.40.1 If Yes, what were these problems (describe and quantify if possible)

4.40.1.1	4.40.1.2	4.40.1.3
Inherent Problems	Offspring from AI	Owned/ Other Animals
a) Difficult to handle		
b) Selective with feed		
c) Easily gets sick		
d) Cannot be used as draft (in case of carabao)		
e) Other, specify		

SECTION V. MANAGEMENT PRACTICES FOR INSEMINATED ANIMAL AND OFFSPRING (only for same species as the inseminated animal) Note: For non-beneficiaries and unsuccessful beneficiaries, information must be based on current practices. For successful beneficiaries, obtain information *Before* AI and *After* AI or Present practices

5.1. Feeds and Feeding System

5.1.1 Feeding Management

5.1.1.1 Do you practice tethered grazing for your cattle/carabaos? ___ 0 – No 1 – Yes.

5.1.1.1.1 – 5.1.1.1.4 If Yes, please provide the following details:

	5.1.1.1.1	5.1.1.1.2	5.1.1.1.3	5.1.1.1.4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
For what type of animal is this practiced? [a]				
For how long is the animal tethered in a day?				
How often is this done?				
How big is the area used?				
Is the area also used by other animals?				
What are the common vegetation involved?				
How far from the house is the area involved?				
Who provides labor for grazing the animal?				
Time spent per day (hours): _____				
If labor is hired, how much is paid (P/hr)?				

[a] 1 – suckling calves 2 – weanlings 3 – 1 to 3 years old 4 – pregnant females 5 – lactating cows, not milked
6 – lactating cows, milked 7 – males > 3 years

5.1.1.2 Do you practice supervised grazing *(bakero)* for your cattle/ carabaos? ____ 0 – No 1 – Yes

5.1.1.2.1 - 5.1.1.2.4 If Yes, please provide the following details:

	5.1.1.2.1	5.1.1.2.2	5.1.1.2.3	5.1.1.2.4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
For what type of animal is this practiced? [a]				
For how long is this done in a day?				
How often is this done?				
How big is the area used?				
Is the area also used by other animal owners?				
What are the common vegetation involved?				
How far from the house is the area involved?				
Who provides labor for grazing the animal?				
Time spent per day (hours): _____				
If labor is hired, how much is paid (P/hr)?				

[a] 1 – suckling calves 2 – weanlings 3 – 1 to 3 years old 4 – pregnant females 5 – lactating cows, not milked
6 – lactating cows, milked 7 – males > 3 years

5.1.1.3 Do you practice cut-and-carry feeding (*kumpay*) for your cattle/ carabao? ___ 0 – No 1 – Yes

5.1.1.3.1 - 5.1.1.3.4 If Yes, please provide the following details:

	5.1.1.3.1	5.1.1.3.2	5.1.1.3..3	5.1.1.3..4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
For what type of animal is this practiced? [a]				
When is this done?				
How often is this done?				
How much cut feed is provided?				
How big is the cut and carry area?				
Is the area also used by other animal owners?				
What are the common vegetation involved?				
How far from the house is the area?				
Who provides labor for cutting? For feeding?				
Time spent per day (hours) : _____				
If labor is hired, how much is paid (P/hr)?				

[a] 1 – suckling calves 2 – weanlings 3 – 1 to 3 years old 4 – pregnant females 5 – lactating cows, not milked
6 – lactating cows, milked 7 – males > 3 *years*

5.1.1.4 Are you hand-feeding crop residues (rice straw, corn stover, cuttings from food crops) to your cattle/ carabao? ___ 0 – No 1 – Yes

5.1.1.4 .1 - 5.1.1.4 .4 If Yes,:

	5.1.1.4 .1	5.1.1.4.2	5.1.1.4.3	5.1.1.4.4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
What crop residues are you using? [a]				
For what type of animal is this practiced? [b]				
How often is this done?				
How much crop-residue is provided each time?				
From where do you get the crop-residues?				
How far from the house is the area involved?				
Are you paying for the crop residue? 0 – No ; 1 – Yes				
If yes, how much? _____				
Who provides labor for collecting, transporting and feeding the crop residue				
Time spent per day (hours):				
If labor is hired, how much is paid (P/hr)?				

[a] 1 – rice straw 2 – corn stover 3 – cuttings from food crops 4 – other (specify)

[b] 1 – suckling calves 2 – weanlings 3 – 1 to 3 years old 4 – pregnant females 5 – lactating cows, not milked
6 – lactating cows, milked 7 – males > 3 years

5.1.1.5 Are you feeding agro-industrial by-products (rice bran, corn bran, copra meal, spent grains, pollard) to your cattle/ carabao? _____

0 – No 1 – Yes

5.1.1.5.1 - 5.1.1.5.4 If Yes:

	5.1.1.5.1	5.1.1.5.2	5.1.1.5.3	5.1.1.5.4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
What agro-industrial by-products are you using? [a]				
For what type of animal is this practiced? [b]				
How often is this done?				
How much of this is provided (kg/day)?				
Are you paying for the by-product? 0 – No ; 1 – Yes				
If yes, how much (P/kg)? _____				
From where do you get the by-product (source)?				
How far from the house is the source?				
Who provides labor for collecting, transporting and feeding the by-product?				
Time spent per day (hours):				
If labor is hired, how much is paid (P/hr)?				

[a] 1 – rice bran 2 – corn bran 3 – copra meal 4 – spent grains 5 – pollard 6 – other (specify)

[b] 1 – suckling calves 2 – weanlings 3 – 1 to 3 years old 4 – pregnant females 5 – lactating cows, not milked
6 – lactating cows, milked 7 – males > 3 years

5.1.1.6 Are you feeding commercial concentrates to your cattle/carabao? _____ 0 – No 1 – Yes

5.1.1.5.1 - 5.1.1.5.4 If Yes, please provide the following details:

	5.1.1.5.1	5.1.1.5.2	5.1.1.5.3	5.1.1.5.5
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
What concentrate feeds are you using?				
For what type of animal is this practiced? [a]				
How often is this done?				
How much of this is provided (kg/day)?				
Are you paying for the concentrate? 0 – No ; 1 – Yes				
If yes, how much? _____				
From where do you get the concentrate?				
How far from the house is the source?				
Who provides labor for collecting, transport and feeding the concentrate?				
Time spent per day (hours): _____				
If labor is hired, how much is paid (P/hr)?				

[a] 1 – suckling calves 2 – weanlings 3 – 1 to 3 years old 4 – pregnant females 5 – lactating cows, not milked
6 – lactating cows, milked 7 – males > 3 years

5.1.2. What forage and pasture species did you plant and utilize for your (SAME SPECIES as inseminated animal)? _____

5.1.3. Area planted to forages (sq m): _____ Cost of establishment: PhP_____

5.1.4. Source of planting materials: _____

1 – DA Satellite Stations 2 – Other farmers 96 – Others, specify _____

5.1.5 Are these forage species also fed to other animals?_____ 0 – No 1 – Yes

5.1.5.1 If Yes, which animals? _____

5.1.6 Do you use fertilizer (including manure) for your forages? _____ 0 – No 1 – Yes

5.1.6.1 If No, why? _____

5.1.6.2 If Yes,

5.1.6.2 .1 What fertilizer do you use? _____

5.1.6.2 .2 To what forages do you apply said fertilizer? _____

5.1.6.2 .3 What is the rate of application (kg/ha)? _____

5.1.6.2 .4 How often did you apply such fertilizer? _____

5.1.6.2 .5 How much is the cost of fertilizer? PhP _____

5.1.7. Did you feed your (SAME AS inseminated animal) with other agricultural products (rice straw, stover, etc.) available on your farm? (Encircle answer) 0 – No 1 – Yes

5.1.7.1 No, why not? _____

5.1.7.2 Yes, specify products used _____

5.1.8. Problems Experienced with Feeds and Feeding System and Solutions to the Problems

5.1.8.0	5.1.8.1	5.1.8.2
Problems Encountered in Feeding	Month/ Period Problem is Usually Experienced	Solution to the Problem
Feed available is not enough		
Feed available has low quality		
Animal is very selective of feed		
No money to buy concentrates		
High price of concentrates		
No available concentrates in the barangay		
Other, specify _____		

5.2 Health Management (only for the same species as the inseminated animal)

5.2.1 Health Management Practices

5.2.1.0	5.2.1.1	5.2.1.2	5.2.1.3	5.2.1.4	5.2.1.5	5.2.1.6	5.2.1.7	5.2.1.8	5.2.1.9	5.2.2.0
TYPE	2010					2017				
	How Often	What were Used	Qty Used	Source	Cost	How Often	What were Used	Qty Used	Source	Cost
Vaccination against • Hemorrhagic septicemia • Foot and Mouth Disease (FMD)										
Fecalysis										
Deworming w/ chemicals										
Deworming w/ herbal dewormers										
Mange control ("galis")										
Delousing or Deticking										
Disinfection										
Administration of vitamins (ADE, B-complex)										
Other, specify:										

Code to Frequency (5.2.1.1/5.2.1.6)

1 – Weekly
2 – Monthly
3 – Quarterly
4 - Annually
5 – Only when needed
96 – Other, specify

Code to Source (5.2.1.4/5.2.1.9)

1 – Own produce
2 – Bought
3 – PCC
4 – Fellow farmer
5 – DA-LGU
96 – Other, specify _____

5.2.3 Health-Related Problems Encountered with Offspring Produced from AI Only for SUCCESSFUL BENEFICIARIES

5.2.3.0	5.2.3.1	5.2.3.2
Health Problems	Rank	How was the Problem Controlled or Avoided?
Disease		
FMD		
Surra		
Hemorrhagic Septicemia		
Other, specify _____		
Respiratory Disease		
Pneumonia		
Tuberculosis		
Digestive Disorder		
Scouring		
Bloat		
Hardware disease		
Parasitism		
Internal		
External		
Prolapse "buwa"		
Lameness		
Accident		
Poisoning		
Other, specify _____		

5.3 Other Management Practices (only for the same species as the inseminated animal)

5.3.0	5.3.1	5.3.2	5.3.3	5.3.4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
Prepare a calving area (where, distance from house)				
Assist cow in calving (how and who)				
Cutting and disinfection of calf's navel cord				
Cleaning of calf after birth (how and who)				
Assist calf in suckling				
Assist cow in expelling placenta (how and who)				
Uterine flushing (how/what is used for flushing)				
How many days after calving				
Who does?				
Cost				
Providing water to newly calved cow (0 - No ;1 - Yes)				
Source of water				
How much water				
How often				
For how long				
Providing feed to newly calved cow (0 - No ;1 - Yes)				
What feed				
How much				
How often				
For how long				
Confinement (C) or restricted tethering (R): for how long				

5.3.0	5.3.1	5.3.2	5.3.3	5.3.4
	Non-Beneficiary	Beneficiary: Unsuccessful	Beneficiary: Successful	
			Before AI	After AI/Present
Other post-calving management (describe and for how long)				
Start of wallowing (no. of days after calving)				
Deworming of calf (type/name of dewormer)				
Age of calf at deworming				
Cost of dewormer				
Deworming of cow/ caracow (type/name of dewormer)				
When and how often is deworming done				
Cost of dewormer				
Use of supplements (type/name of supplement)				
When and how often is it done				
Cost of supplements				
Cost of veterinary drugs and supplies				
Cost of veterinary services				
Where does the calf stay at night (with cow or separate)				
With cow				
Separate from cow (starting when? Until?)				
Age of calf at weaning				
When do you start observing the cow for estrus (after calving)?				
Method of breeding (1=AI, 2= natural mating)				
Source of male breeder/semen (1=owned; 2=PCC/DA, 3=others)				
Mode of payment				

SECTION VI. REVENUE AND COST (from 2010 to December 2017)

6.1. Status of Farmer's Animals (including offspring of AI) and Income Generated from 2010 to December 2017 (for the same species as the inseminated animal)

6.1.1.0	6.1.1.1	6.1.1.2	6.1.1.3	6.1.1.4	6.1.1.5	6.1.1.6	6.1.1.7	6.1.1.8	6.1.1.9	6.1.2.0	6.1.2.1
Animal No.	Offspring of AI? 0 – No 1 - Yes	Sex 1 – Male 2 - Female	Year of Birth	Breed of Mother	Use of Animal (please check)				Year Used	Age at Start of Use	Income (PhP)
					Sold	Slaughtered	Draft	Milking			
Code to Breed of Mother (6.1.1.4): 1 – Native 2 – Purebred 3 – Crossbred											

SECTION VII. TECHNOLOGY ADOPTION, COMMUNICATION AND SUPPORT SERVICES For beneficiaries only

7.1. When did you first hear about the Artificial Insemination (AI) Technology? ____ (Year)

7.2. From whom did you learn about the AI technology? _____

1 – DA Technician 2 – PCC Technician 3 – VBAIT
96 – Other, specify _____

7.3. What did you do after first learning/hearing about (AI) Technology? _____

_____

_____

7.4. In what year did you first try Artificial Insemination (AI) Technology on your female cow/carabaos? _____

7.5. Since then, do you have your cow/carabaos bred thru AI? _____

0– No 1 – Yes

7.5.1. If No, why? _____

_____

7.5.2. If Yes, why? _____

_____

7.6. Did you share/pass the knowledge/information and skills learned about Artificial Insemination (AI) to others? _____ 0 – No 1 – Yes

7.6.1. If No, why? _____

_____

7.6.2. If Yes, to whom did you share and what kind of knowledge and skills were shared?

7.6.2.0	7.6.2.1	7.6.2.2	7.6.2.3	7.6.2.4
Name	Relationship	Information shared	In what occasion?	Venue/Address

7.7. In your barangay, what is the breeding practice before and at present of other carabao raisers?

7.7.0	7.7.1	7.7.2
Particulars	Before	At Present
How many breedable female carabao in the barangay?		
What is the dominant breed of female carabao in the barangay?		
What is the common breeding practice?		

Table 7.7, continued. . .

7.7.0	7.7.1	7.7.2
In your estimate, what is the proportion of the total number of farmers in your community who used Artificial Insemination (AI) to breed their carabaos?	_____ %	_____ %
Code: Common Breeding Practice: 1 – Natural mating with native bulls; 2 – Natural mating with crossbred bulls 3 – Natural mating with purebred bulls 4 – Artificial insemination		

7.8. What problems do you experience in relation to adopting AI breeding services? (ENCIRCLE – MULTIPLE RESPONSES ACCEPTABLE)

1 – Heat detection
2 – Availability of AI technician
3 – Availability of semen
4 – Location of the AI technician is too far away from my farm
5 – The service charge is higher that what I expected for Artificial Insemination
6 – The chance of impregnation is not that different from Normal Mating
96 – Other, specify _____

SECTION VIII. ORGANIZATIONAL MEMBERSHIPAND INFORMATION ON TRAINING/SEMINAR ATTENDED

8.1 Organizational Membership

8.1.0	8.1.1	8.1.2	8.1.3	8.1.4	8.1.5	8.1.6
Name of Association/Cooperative /Organization	Relationship to HH	Type fo Organization	Year of Membership	Position	If officer, is he/she was 1 – elected or 2 – appointed on the position	Gender composition of the organization (% Male and Female)
1						
2						
3						
4						
5						

CODE:

Relationship to HH
Refer to Codes to Relationship to HH (8.1.1)

Position:
0 – Member
1 – Officer

Type of Organization:
1 – Cooperative
2 – Farmer's Group
3 – Professional Group
96 – Others (specify) _____

Gender composition of the organization
1 – Women only membership
2 – Men only membership
3 – Mixed male and female membership

8.2 Trainings and Seminars Attended

8.2.1 Have you or any member of the household attended the any seminar/trainings related to AI? _____ 0 – No 1 – Yes

8.2.1.1	8.2.1.2	8.2.1.3
Title of Training	Year	Name of Organizer
1		
2		
3		
4		
5		
6		

8.2.2 Enumerate training-related problems, if any:

a. _____

b. _____

c. _____

8.2.3 What are the positive impacts in attending the training? (ENCIRCLE – MULTIPLE RESPONSES ACCEPTABLE)

1 – Know how to detect heat

2 – Know how to manage inseminated animal

3 – Know how to facilitate calving

4 – Know how to manage calf and cow/ caracow

96 – Other, specify _____

SECTION IX. IMPACTS FOR BENEFICIARIES ONLY

9.1 Social Impact

9.1.1 Are you aware if the Artificial Insemination (AI) breeding has made any changes in the following area in your community?

9.1.1.1	9.1.1.2	9.1.1.3
CATEGORY	0 – No; 1 – Yes	Description of observed changes
Pagbabago ng pananaw tungkol sap ag-aalaga ng kalabaw/ baka		
Pagbabago ng pananaw tungkol sa gamit o silbi ng kalabaw/ baka		
Pagbabago ng pananaw tungkol sa kabutihang idudulot ng pag-aalaga ng kalabaw/ baka		
Pagbabago ng pananaw tungkol sa paano pagkakakikitaan ang kalabaw/ baka		
Other, specify _____		

9.2 Environmental Impacts

9.2.1 Are you aware if the Artificial Insemination (AI) breeding has made any contribution or changes to the improvement of the following area in your community? _____ 0 – No 1 – Yes

9.2.1.0 – 9.2.1.3 If Yes, please fill up the table below.

9.2.1.0	9.2.1.1	9.2.1.2
CATEGORY	0 – No; 1 – Yes	Description of Observed Changes
Increase in number of crossbred carabaos in the community		
Increase in number of purebred carabaos in the community		
Paggamit ng crop by-products bilang pagkain sa bulugan		
Pagkakaroon ng waste pit para sa mga dumi ng kalabaw		
Pagkokompost gamit ang dumi ng hayup (kalabaw, baka, kambing at iba pa)		
Paggamit ng compost bilang pataba sa bukid (*itala ang mga crops na ginagamitan ng compost*)		
Pagbabawas ng pagsunog ng dayami sa bukid		
Conversion of agricultural lands to grasslands/pasture		
Pagdami ng mapaminsalang insekto at peste sa bukid		
Spread of disease – disease transmission to other ruminants/livestock		
Shift in livestock species/system		

SECTION X. ADDITIONAL INFORMATION FOR FARMER-BENEFECIARIES OF ARTIFICIAL INSEMINATION

10.1 How did you become involved with the AI Program of DA?

_____

_____

_____

10.2 From your point of view, describe the most significant change that has resulted from your availment of the AI service.

_____

_____

_____

10.2.1 Why is this change significant to you?

_____

_____

_____

10.2.2 What difference has this made now or will it make in the future?

_____
_____
_____

10.2.3 What are the observable evidences that can support or substantiate your "change stories"?

_____
_____
_____

10.3 Would you recommend this AI service to others? _____ 0 – No 1 – Yes

10.3.1 If Yes, explain _____
_____
_____

10.3.2 If No, explain_____
_____
_____

10.4 How do you assess the success of the AI Program of DA?

10.4.1 High, explain _____
_____
_____

10.4.2 Moderate, explain _____
_____
_____

10.4.3 Low, explain _____
_____
_____

10.5 Do you have any suggestion(s) to further improve the implementation of the Unified Animal Insemination Program? _____ 0 – No 1 – Yes

10.5.1 If yes, explain _____
_____
_____
_____

Thank You Very Much!!!

Annex 3. Questionnaire for the SAIS-RED Project

CONFIDENTIALITY: The Interviewer takes the responsibility in guarding the confidentiality of all the information generated through this instrument.	**Impact Evaluation of the Agri-Pinoy Livestock Program (A-PLP) in Samar Island (Samar Island Small Ruminants Rural Enterprise Development Project)**

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 Agri-Pinoy Livestock Program (A-PLP) which was implemented by the Department of Agriculture Regional Field Office VIII and Local Government Unit (LGU) in your area. Your household has been randomly selected as respondent to represent the Samar Island Small Ruminants Rural Enterprise Development (SAIS-RED) Goat Project (beneficiaries/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

1.1 Personal Information and Socio-economic Characteristics of Farmers

1.1.1 Type of Respondent: _____ 0 – Non-Beneficiary 1 - Beneficiary

1.2 Household Address

1.2.1 Purok/Sitio : _____

1.2.2 Barangay : _____

1.2.3 Municipality : _____

1.2.4 Province : _____

1.3 Name of Respondent

1.3.1 First Name : _____

1.3.2 Middle Name: _____

1.3.3 Last Name : _____

1.4 Age : _____

1.5 Gender : _____ (1 – Male; 2 – Female)

1.6 Civil Status : _____ (1 – Single; 2 – Married; 3 – Widowed; 4 – Separated/Divorce; 5 – Live-in)

1.7 Number of years in school : _____ (please refer to code for Education (**13**) found on page 2 for the household profile)

1.8 Contact Number : _____

SECTION II. HOUSEHOLD CHARACTERISTICS & LAND OWNERSHIP

2.1 Household Profile

2.1.1	2.1.2	2.1.3	2.1.4	2.1.5	2.1.6	2.1.7	2.1.8	2.1.9	2.2.0
Who are the members of this household? (list in this order) Family Name, First Name	Relationship to Household Head	Age	Sex	Civil Status	Education	Presently Attending School?	Type of School	Occupation	
								Primary	Secondary
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
10.									

Codes to Relationship to HH (2.1.2)

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
96 – Other Relative

Codes to Sex (2.1.4)

1 – Male
2 – Female

Codes for Education (2.1.6)

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 (2.1.9/2.2.0)

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) _____

Code to Civil Status (2.1.5)

1 – Single
2 – Married
3 – Widowed
4 – Separated/Divorce
5 – Live-in

Code to Attending School (2.1.7)

0 – No
1 – Yes

Code to Type of School (2.1.8)

1 – Public
2 – Private

2.2 Income and Employment Profile (Note: For non-beneficiaries, proceed to questions *2.2.2 and 2.2.4*)

2.2.0	2.2.1	2.2.2	2.2.3	2.2.4
Mga pinagkukunan ng kita (Sources of Income)	Bilang ng mga Miyembro sa Pamilya na Nalalapat (Number of Members in the Family Who are Involved)		Tinatayang kita bawat taon (Estimated Income per Year)	
			Kita (Earnings/ Income)	
	2012	2017	2012	2017
Farm Income				
Goat				
Carabao				
Sheep				

Table 2.2 continued. .

2.2.0	2.2.1	2.2.2	2.2.3	2.2.4
Mga pinagkukunan ng kita (Sources of Income)	Bilang ng mga Miyembro sa Pamilya na Nalalapat (Number of Members in the Family Who are Involved)		Tinatayang kita bawat taon (Estimated Income per Year)	
			Kita (Earnings/ Income)	
	2012	2017	2012	2017
Cattle				
Swine				
Poultry				
Rice				
Vegetables				
Coconut				
Other, (specify)				
Sub-Total (to be computed)				
Off-farm Income				
Planting				
Plowing				
Weeding				
Other, specify _____ _____				
Sub-Total (to be computed)				
Non-farm Income				
Sub-Total (to be computed)				
Other sources:				
Sub-Total (to be computed)				
TOTAL (to be computed)				

Code to Non-farm Income:

1 – Sweldo sa trabaho na galing sa pribadong sektor (Salaried employment in private sector)
2 – Sweldo sa trabaho na galing sa gobyerno (Salaried employment in government)
3 – Parangalan (Honorarium)
4 – Negosyo Business (sari-sari store, etc.)
5 – Fishing

Code to Other Sources:

1 – Natanggap na remittance (Remittance received (Domestic & Foreign)
2 – Pensiyon, pagreretiro at iba pang katulad na benepisyo (Pension, retirement & other similar benefits)
3 – Tulong mula sa isang programang pangkapakanan ng pamahalaan (Assistance from a government welfare program (e.g., CCT, 4Ps)
4 – Tulong mula sa opisyal ng pamahalaan (Assistance from government officials)
5 – Tulong mula sa mga kamag-anak at kaibigan (Assistance from relatives and friends)
6 – Natanggap na mga premyo Prizes received (raffle, gambling, etc.)

2.3 Information on Dwelling Place (Note: For non-beneficiaries, proceed to Present questions.)

2.3.1	2.3.2	2.3.3	2.3.4	2.3.5	2.3.6
Period	Pagmamay-ari ng bahay (House Ownership)	Toilet Facility	Supply ng tubig (Water Supply)	Kagamitan ng tubig (Uses of Water)	Layo mula sa bahay ng pinagmumulan ng tubig (Distance from the House of the Water Source)(meter)
2012					
Present					

Code for House Ownership (2.3.2)
1 – Pag-aari (Owned)
2 – Nirerentahan (Rented)
3 – Nakatira sa iba (Living with others)
96 – Iba pa (Others, (specify)_____

Codes for Toilet Facility (2.3.3)
1 – Flush
2 – Pour
3 – Antipolo type
4 – None
96 – Others (specify)_____

Codes for Water Supply (2.3.4)
1 – Pribadong koneksyon sa tubig (Private water connection/piped-in)
2 – Mga tanke na ibinigay ng gobyerno at iba pang mga grupo (Water pipes/tanks provided by the government and other groups)
3 – Refilling Station
4 – Mineral na tubig mula sa mga tindahan (Mineral Water from Stores)
5 – Spring Water (Tubod)
6 – Tubig na galing sa ulan (Rain Water)
7 – Well water (Tabay)

Codes for Uses of Water (2.3.5)
1 – Pang inuming tubig lamang (Drinking only)
2 – Pangluto na tubig lamang (Cooking only)
3 – Pang local na tubig lamang (Domestic used only)
4 – Pang inomin at pangluto lamang (Drinking & Cooking)
5 – Pang inomin, pangluto at pang lokal na tubig lamang(Drinking, cooking, and domestic used)

2.4 Household/ Farm Assets and Vehicles

2.4.0	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5
Code	Item name	Qty	Value (Purchase price in PhP)	Year purchased	Where did you obtain the money used to buy this item?
	Household Assets				
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				
12	Other, specify				
	Farm and Livestock Assets				
13	Plow				
14	Tractor				

Table 2.4, continued. . .

2.4.0	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5
Code	Item name	Qty	Value (Purchase price in PhP)	Year purchased	Where did you obtain the money used to buy this item?
15	Water pump				
16	Carabao				
17	Cattle				
18	Goat				
19	Sheep				
20	Other, specify				
Vehicles					
21	Bicycle				
22	Pedicab				
23	Motorcycle or Scooter				
24	Tricycle				
25	Car/Jeep				
26	Pick-up/Truck				
27	Pump boat				
28	Non-motorized Banca				
29	Other, specify				

SECTION III. FARM AND ENTERPRISE CHARACTERISTICS

3.1 Bilang ng mga taon ng pag-aalaga ng hayop (Number of years in livestock raising) : _____

3.2 Bilang ng mga taon ng pag-aalaga ng mga kambing (Number of years in goat raising) : _____

3.3 Kabuuang lugar ng sakahan (Total farm area) (ha) : _____

3.4 Kabuuang lugar na ginagamit para sa pagpapalaki ng kambing (Total area used for goat raising) (ha) : _____

3.4.1 Land ownership: _____

1 – Owner 2 – Leaseholder 3 – Tenant 4 – Other, specify _____

3.5 Kabuuang lugar ng pastulan (Total pasture/ grazing area) for goats (ha):

3.5.1 Before 2013: _____ 3.5.2 Present: _____

3.6 Infrastructural Distance and Accessibility

3.6.0	3.6.1	3.6.2	3.6.3
Lokasyon (Location)	Distance (km)	(Dominant Mode of Transportation)	(Dominant Type of Road)
Sakahan papunta sa pinakamalapit na kalsada (Farm to nearest road)			
Sakahan papuntang paninirahan (Farm to residence)			
Sakahan papuntang merkado (Farm to output market)			
Sakahan papuntang bilihan ng inputs (Farm to inputs supply)			

Code to Mode of Transportation (3.6.2)

1 – Maglakad (Walk)
2 – Pagsakay sa mga hayop (Riding animals e.g: horse, cow or carbao)
3 – Bisikleta (Bicycle)
4 – Motorsiklo/Tricycle (Motorcycle/Tricycle)
5 – Public Bus/Jeepney
6 – Sarling sasakyan (Own vehicle)
96 – Iba pa Other, (Specify) _____

Code to Type of Road (3.6.3)

1 – Sukal na daan (Dirt road)
2 – Kaskaho na daan/Lahat ng panahon (Gravel/All-weather)
3 – Aspalto (Asphalt)
4 – Kongkreto (Concrete)
96 – Iba pa (tukuyin) Other (specify): ___

3.7.0 Purpose of Raising Goat *(Note: For non-beneficiaries, please proceed to question 3.7.3 onwards.)*

3.7.0.1	3.7.0.2	3.7.0.3	3.7.0.4
Ano ang iyong layunin sa pagpapalaki ng kambing? (What is your purpose of raising goat?) 2012	Rank	Ano ang iyong layunin sa pagpapalaki ng kambing? (What is your purpose of raising goat?) Present	Rank

3.7.1 Goat Inventory and mortality by Type of Goat

3.7.1.1	3.7.1.2	3.7.1.3	3.7.1.4	3.7.1.5	3.7.1.6	3.7.1.7	3.7.1.8	3.7.1.9
Type	2012				2017			
	No. of Heads	Breed	No. of Death	Mortality (%) (to be computed)	No. of Heads (2017)	Breed	No. of Death	Mortality (%) (to be computed)
1.Kid								
2.Growing/ Fattener								
3.Breeder Doe								
4.Breeder Buck								

Code to Breed (3.7.1.3/3.7.1.7)

1 – Anglo Nubian
2 – Saanen
3 – Native
4 – Crossbred (F1), specify breeds crossed _____
5 – Boer
6 – Other, specify _____

3.7.2 Morbidity by Type of Goat

3.7.2.1	3.7.2.2	3.7.2.3	3.7.2.4	3.7.2.5
	2012		2017	
TYPE	No. of Sick Goat	Morbidity (%) (to be computed)	No. of Sick Goat	Morbidity (%) (to be computed)
1 Kid				
2 Growing/ Fattener				
3 Breeder Doe				
4 Breeder Buck				

3.7.3 Investment Items for Goat Production

3.7.3.1	3.7.3 .2	3.7.3 .3	3.7.3 .4	3.7.3 .5	3.7.3 .6
Items	Number	Unit Price	Total Cost	Year Built/Acquired	Estimated Life Span
Housing (materials and labor)					
Foundation Stock – Doe (female goat)					
Foundation Stock – Buck (male goat)					

Table 3.7.3, continued. . .

3.7.3.1	3.7.3 .2	3.7.3 .3	3.7.3 .4	3.7.3 .5	3.7.3 .6
Items	Number	Unit Price	Total Cost	Year Built/Acquired	Estimated Life Span
Equipment					
Machine					

3.7.3 .7. Annual depreciation cost "Before 2013" (to be computed): _____

3.7.3 .8. Annual depreciation cost "2017" (to be computed): _____

3. 8 Return and Cost (One Year Production Cycle – January to December)

3.8.1.1 Annual Revenue *(Note: If the answer to every revenue item in questions 3.8.1.2 & 3.8.1.11 is 0-No, please don't proceed to questions 3.8.1.3 -3.8.1.10/ 3.8.1.12-3.8.1.19)*

3.8.1.1	3.8.1.2	3.8.1.3	3.8.1.4	3.8.1.5	3.8.1.6	3.8.1.7	3.8.1.8	3.8.1.9	3.8.1.10	3.8.1.11	3.8.1.12	3.8.1.13	3.8.1.14	3.8.1.15	3.8.1.16	3.8.1.17	3.8.1.18	3.8.1.19
	2012									2017								
Revenue Item	Did you sell/ provide service (revenue item-)? (0 – No; 1 – Yes)	No. of Head	Ave. Age (Years)	Ave. Weight (kg)	Freq.	Unit Price	Total Return (PhP)	Breed	Market Outlet	Did you sell/ provide service (revenue item-)? (0 – No; 1 – Yes)	No. of Head	Ave. Age (Years)	Ave. Weight (kg)	Freq.	Unit Price	Total Return (PhP)	Breed	Market Outlet
1 Fattener																		
2 Culled does																		
3 Culled buck																		
4 Breeder does																		
5 Breeder buck																		
6 Buck service (frequency)																		
7 Manure		-99	-99					-99			-99	-99					-99	
8 Urea-molasses mineral block (UMMB)		-99	-99					-99			-99	-99					-99	
9 Urea-molasses 42.9 mineral tube (UMMT)		-99	-99					-99			-99	-99					-99	
10 Seedlings for forage/ pasture		-99	-99					-99			-99	-99					-99	

Table 3.8.1.1, continued. . .

3.8.1.1	3.8.1.2	3.8.1.3	3.8.1.4	3.8.1.5	3.8.1.6	3.8.1.7	3.8.1.8	3.8.1.9	3.8.1.10	3.8.1.11	3.8.1.12	3.8.1.13	3.8.1.14	3.8.1.15	3.8.1.16	3.8.1.17	3.8.1.18	3.8.1.19
Revenue Item	2012									2017								
	Did you sell/ provide service (revenue item-)? (0 – No; 1 – Yes)	No. of Head	Ave. Age (Years)	Ave. Weight (kg)	Freq.	Unit Price	Total Return (PhP)	Breed	Market Outlet	Did you sell/ provide service (revenue item-)? (0 – No; 1 – Yes)	No. of Head	Ave. Age (Years)	Ave. Weight (kg)	Freq.	Unit Price	Total Return (PhP)	Breed	Market Outlet
11 Milk (liters)		-99	-99	-99				-99			-99	-99	-99				-99	
12 Goat Meat		-99	-99					-99			-99	-99					-99	
13																		
14																		
15																		

Code to Breed (3.8.1.9/3.8.1.18)
1 – Anglo Nubian 2 – Toggenberg 3 – Tennessee 4 – Alpine 5 – Jamnapari 6 – Saanin
96 – Other (specify) : _____-

Code to Market Outlet (3.8.2.0/3.8.1.19)
1 – Trader or middleman 2 – Auction market 3 – Walk in consumers
4 – Directly to farmers 96 – Others (Specify) _____

To be computed:

3.8.2 Total Return (animals sold – #1 to 5) : _____ 3.8.2.1 Total Return (buck service - #6): _____

3.8.3 Total Return (other products - #7 to 12) : _____

3.8.4 Annual Cost of Production (January to December)

3.8.4.1	3.8.4.2	3.8.4.3	3.8.4.4	3.8.4.5	3.8.4.6	3.8.4.7	3.8.4.8	3.8.4.9	3.8.4.10	3.8.4.11
Cost Item	2012					2017				
	No. of Persons	No. of Days	Amount/ Qty	Unit Price (PhP)	Total Cost (PhP) (to be computed)	No. of Persons	No. of Days	Amount / Qty	Unit Price (PhP)	Total Cost (PhP) (to be computed)
Labor (for all activities for goat production)										
Hired labor (manday)			-99							
Own/ family labor (manday)			-99							
Material and other Inputs										
Concentrate feeds (kilogram)										
For Kid	-99	-99				-99	-99			
For Growing/ Fattener	-99	-99				-99	-99			
For Breeder Doe	-99	-99				-99	-99			
For Breeder Buck	-99	-99				-99	-99			
Urea molasses mineral block (kilogram)	-99	-99				-99	-99			
Forage and pasture (number of seedlings/ kilogram)	-99	-99	-99	-99		-99	-99	-99	-99	
Veterinary drugs and supplies	-99	-99	-99	-99		-99	-99	-99	-99	
Utilities (Water and Electricity)	-99	-99	-99	-99		-99	-99	-99	-99	
Hauling and transportation	-99	-99	-99	-99		-99	-99	-99	-99	
Housing maintenance	-99	-99	-99	-99		-99	-99	-99	-99	
Slaughter (kilogram)	-99	-99				-99	-99			
Milk production (liters)	-99	-99				-99	-99			
Other, specify										

3.8.5.0 Total Labor Cost (to be computed): 2012: _____

3.8.5.1 Total Labor Cost (to be computed): 2017: _____

3.8.5.2 Total Cost of Materials and Other Inputs (to be computed: 2012: _____

3.8.5.3 Total Cost of Materials and Other Inputs (to be computed: 2017: _____

3.8.6 Transport and Delivery

3.8.6.1	3.8.6.2	3.8.6.3	3.8.6.4	3.8.6.5	3.8.6.6	3.8.6.7	3.8.6.8	3.8.6.9
Goat Product	Mode of Transportation		Travel Time (in minutes)		How did you bring your produce to marketing outlet?		Marketing Cost	
	2012	2017	2012	2017	2012	2017	2012	2017
1 Fattener sold								
2 Culled does sold								
3 Culled buck sold								
4 Breeder does sold								
5 Breeder buck sold								
6 Buck service (frequency)								
7 Manure								
8 Urea-molasses mineral block (UMMB)								
9 Urea-molasses 42.9 mineral tube (UMMT)								
10 Forage/pasture (Number of Seedling)								
11 Milk (liters)								

Codes for Mode of Transport (3.8.6.2/3.8.6.3)
1 – Truck
2 – Jeep
3 – Tricycle
4 – Motorcycle / Habal-habal
5 – Hand carry/ walking
96 – Other (specify) _____

Codes for Product Delivery (3.8.6.6/3.8.6.7)
1 – Pick up (on farm)
2 – Pick up on road side/pick up point
3 – Delivered to buyer
96 – Other (specify) _____

SECTION IV. ADOPTION PATHWAY AND IMPACTS

4.1 For Non-Beneficiary Farmers

4.1.1 Have you heard about the Small Ruminants Rural Enterprise Development (SAIS-RED) Goat Project? _____ 0 – No 1 - Yes

4.1.1.1 If yes, from whom did you know/learn about the program?
1 – Government Institution (please specify _____)
2 – Non-government Organization (please specify _____)
3 – Co-farmer
4 – Relatives and friends
5 – Mass media (please specify _____)
6 – Association/Organization
96 – Other, specify (please specify _____)

4.1.1.2 If yes, why did you not join? _____

4.2 For Small Ruminants Rural Enterprise Development Project Beneficiaries

4.2.1. What motivated you to join the SAIS-RED project?
1 – Increase goat productivity
2 – Increase income
3 – Reduce mortality
4 – Development linkage
5 – Improve genetic resource
96 – Other, specify _____

4.3 Have you availed of services provided by the SAIS-RED project? 0 – No 1 – Yes

4.3.1 If Yes, which services did you avail and rate the degree of adequacy and usefulness as well as provide suggestions to improve services (if rating is not very adequate and not very useful).

4.3.1.1	4.3.1.2	4.3.1.3	4.3.1.4
Services/Technology/Activities	Degree of Adequacy	Degree of Usefulness	Suggestions to Improve Services
Provision of Goat Housing/Improvement of Housing Facilities			
Training Course on Forage Pasture Development and Dairy Prod'n.			
Technological Training on Goat Production System-cum-Enterprise Development			
Training on Urea-Molasses Mineral Block Processing/Production (UMMB)/Salt/Concentrate Supplementation			
Training on Strategic Deworming			
Upgrading and Use of Quality Breeder Buck			
Artificial Insemination Training on Goats-cum-Chevon and Milk Processing			
Educational Tour/ Lakbay-Aral of SAIS RED Project Team and Farmer-Partners to Progressive Goat Farms in Luzon and Mindanao			

Codes for Degree of Adequacy (4.3.1.2)

1 – Very adequate
2 – Adequate
3 – Average
4 – Inadequate
5 – Very inadequate

Codes for Degree of Usefulness (4.3.1.3)

1 – Very useful
2 – Useful
3 – Not useful

4.4. What changes have you noticed since you received training on goat production (specify evidence of these changes)? _____
_____
_____

4.4.1 Economic (Change in income, change in purchasing power, acquisition of assets such as appliances, vehicle, etc., support education of household members)
_____
_____
_____

4.4.2 Social (Increased participation in community activities, increased self-reliance, involvement in major household decisions, etc.)
_____
_____
_____

4.4.3 Environmental (reduction in damage to properties, use of idle lands for pasture, etc.)
_____
_____
_____

4.5. What problems have you experienced in joining the SAIS-RED project?
_____
_____
_____

4.6 What problems have you experienced in adopting the technologies?
_____
_____
_____

4.7. What interventions/assistance do you still need?
_____
_____
_____

4.8 How can the project implementation be improved?
_____
_____
_____

SECTION V: TECHNOLOGY DIFFUSION AND ADOPTION

5.1.0	5.1.1	5.1.2	5.1.3	5.1.4	5.1.5	5.1.6	5.1.7	5.1.8	5.1.9
Component Technology	Year Heard	Year 1st Tried	Year of Adoption	Year Stopped	Year Resumed Adoption	Reason for Adoption	Reason for Non-Adoption	Level of Knowledge About the Technology	Degree of Effectiveness and Changes Observed (Impact)
Provision of housing (establishment and/ or improvement of elevated housing)									
Stall feeding									
Upgrading and use of breeder buck									
Forage and pasture development									
Urea-Molasses Mineral Block (UMMB)/salt/ concentrate supplementation									
Strategic deworming									
Code for Level of Knowledge(5.1.8) 1 – Low 2 – Moderate 3 – High				Code for Effectiveness(5.1.9) 1 – Not effective 2 – Less effective 3 – Effective 4 – Very effective					

5.2.0 What is the type of breed used in upgrading goat? _____ 1 – Purebred 2 – Crossbred 96 – Other, specify _____

5.2.1 What are the forage and pasture species planted/ utilized for goat production? _____

5.2.2 Are these species also fed to other animals? _____ 0 – No 1 – Yes ; Which animal _____

5.2.3 Source of planting materials: _____1 – DA Satellite Stations 2 – Other farmers 96 – Other, specify _____

5.2.4 Do you use goat manure as fertilizer? _____ 0 – No 1 – Yes If No, why? _____

5.2.4.1 If Yes, to what crops do you apply said fertilizer? _____

5.2.5 Do you feed your goat with other agricultural products available on your farm? ____ 0 – No, why? (5.2.5.1) _____

1 – Yes, specify products used (5.2.5.2)_____

5.3 For Farmers Who Discontinued Technology Adoption/ Goat Production

5.3 .1 What are the reasons for discontinuing technology adoption/ goat production? _____

_____

5.3 .2 What would motivate you to engage in goat production again? _____

_____

_____

5.4 Other Details of Management Practices for Goat

[Note: ANSWERABLE BY 0 – No; 1 - Yes]

5.4.1 Nakakulong ba ang inyong kambing sa buong taon? (Are your goats confined throughout the year?)	
5.4.2 Nakalulong ba ang iyong mga kambing sa panahon ng tag-ulan lamang? (Are your goats confined during rainy season only?)	
5.4.3 Ang iyong mga lalaking kambing na hindi nakapon ay isinama ba sa mga babaeng kambing kahit sila ay lampas na sa 3 buwang gulang? (Are your uncastrated male goats kept in the same pen with the females even after they are three months of age?)	
5.4.4 Ang mga lalaki at babae na weanlings (mga anak na kambing na hindi ginagatas) o growers ay magkasama ba sa isang silid? (Are your male and female weanlings or growers kept in one room?)	
5.4.5 Hinihiwalay nyo ba ng pasto o kulungan ang mga inaasahang manganganak na does? (Are expectant does kept in a separate paddock or pen?)	
5.4.6 Pinapainom ba ng unang gatas o colostrum ang mga bagong anak na kambing? (Are kids fed with first milk or colostrum?)	
5.4.7 Kinagawian mo ba ang paghuhugas sa mukha ng lalaking kambing? (Do you practice washing of buck's face?)	
5.4.8 Kinagawian mo ba ang "culling" o pagtanggal ng hindi na manganganak/ magkaka-anak na kambing)? (Do you practice culling?)	
5.4.9 Kinagawian mo ba na ikaw ang pumili sa panahon at kung aling kambing ang ipapalahi? (Do you practice hand mating?)	
5.4.10 Kinagawian mo ba ang pagpurga? (Do you practice deworming?)	
5.4.11 Nababakunahan ba ang iyong mga kambing laban sa sakit na "foot and mouth disease" o FMD? (Are your goats vaccinated against foot and mouth disease?)	
5.4.12 Nababakunahan ba ang iyong mga kambing laban sa hemorrhagic septicemia? (Are your goats vaccinated against hemorrhagic septicemia?)	
5.4.13 Ano ang karaniwang bilang ng batang kambing sa bawat kapanganakan ng iyong inahing kambing? (What is the average number of kids per kidding of does?)	

Table 5.4, continued. . .

5.4 Other Details of Management Practices for Goat

[Note: ANSWERABLE BY 0 – No; 1 - Yes]

5.4.14 Sa karaniwan, gaano karami ang mga batang kambing na may pangunahing depektong pampisikal? (On the average, how many kids have major physical defects?)	
5.4.15 Meron ka bang mga records o talaan tungkol sa iyong pag-aalaga ng kambing? (Do you keep records on goat farming?) (0 – No; 1 – Yes)	
5.4.16 Kung oo, anong uri ng mga talaan o records? (If yes, what kind of farm records?)	
5.4.16 a. Breeding dates of doe	
5.4.16 b. Weight at birth	
5.4.16 c. Weight after 1st month	
5.4.16 d. Weight after 3rd month or upon weaning	
5.4.16 e. Weight at slaughter or market age (8-9 months)	
5.4.16 f. Costs	
5.4.16 g. Return	
5.4.16 h. Mortality	
5.4.16 i. Morbidity	
5.4.16 j. Other, specify _____	
5.4.17. Ano ang pangunahing materyal na ginagamit sa bubong ng kulungan? (What is the main material used in the roof of pen?)	
5.4.18. Ano ang pangunahing materyal na ginagamit sa pader ng kulungan? (What is the main material used in the wall of pen?)	
5.4.19. Ano ang pangunahing materyal na ginagamit sa poste ng kulungan? (What is the main material used in the posts of pen?)	
5.4.20. Paano ka pumili ng breeder na kambing? (How do you choose your breeder stock?)	
5.4.21. Gaano kadalas magsagawa ng serbisyo o pagpapalahi angiyong lalaking breeder na kambing? (How often does a buck perform buck service?)	
5.4.22. Pagkatapos manganak, anong uri ng pagkain ang pinapakain sa inahing kambing? (Immediately after kidding, what type of food was fed to the doe?)	
5.4.23. Paano mo prino-protektahan ang mga batang kambing mula sa lamig? (How do you protect the kids from cold temperature?)	
5.4.24. Kailan isinasagawa (buwan pagkatapos ng kapanganakan) ang dehorning o pag alis ng mga sungay ng kambing? (When was dehorning performed (months after birth)?)	
5.4.25. Kailan ang pagkakapon ng mga batang lalaking kambing (buwan pagkatapos ng kapanganakan)? (When do you castrate male kids not intended for breeding performed (months after birth)?)	

Table 5.4, continued. . .

5.4 Other Details of Management Practices for Goat

[Note: ANSWERABLE BY 0 – No; 1 - Yes]

5.4.26. Tumitingin ka ba ng palatandaan ng paglalandi? (Do you look for sign of estrus?) (0 – No; 1 – Yes)	
5.4.27. Kung oo, anong palatandaan ng paglalandi ang hinahanap mo? (If yes, what signs of estrus do you look for?)	
5.4.27a. Pag-sampa sa iba pang mga hayop sa kawan (Mounting other animals in the herd)	
5.4.27b. Ang pamamaga at pamumula ng ari (Swelling and redding of the vulva)	
5.4.27c. Mucus discharge mula sa ari (panlabas na sex organ) (Mucus discharge from the vulva)	
5.4.27d. Pagkadismaya o pagkabalisa (Uneasiness or restlessness)	
5.4.27e. Other (Please specify other signs of estrus)	

5.5. Enumerate technology-related problems, if any:

5.5a. _____

5.5b. _____

5.5c. _____

SECTION VI. ASSISSTANCE FROM GOVERNMENT AGENCIES AND NON-GOVERNMENT ORGANIZATIONS (for goat and other livestock production activities)

6.1 Government

6.1.1. Did you receive cash assistance from government? _____ (0 – No; 1 – Yes)

6.1.1.1	6.1.1.2	6.1.1.3	6.1.1.4	6.1.1.5
Cash Assistance (Amount and Purpose)	Year	National	Provincial	Local
1				
2				
3				
4				

6.1.2 Did you receive noncash assistance from the government? _____ (0 – No; 1 – Yes)

6.1.2.1	6.1.2.2	6.1.2.3	6.1.2.4	6.1.2.5
Noncash Assistance (Form)	Year	National	Provincial	Local
1				
2				
3				
4				

6.1.3 Private/Non-government Organizations

6.1.3.0 Did you receive cash assistance from NGOs?_____ (0 – No; 1 – Yes)

6.1.3.1	6.1.3.2	6.1.3.3
Name of NGO	Amount and Purpose	Year
1		
2		
3		
4		

6.1.4 Did you receive noncash assistance from NGOs? _____ (0 – No; 1 – Yes)

6.1.4.1	6.1.4.2	6.1.4.3
Name of NGO	Amount and Purpose	Year
1		
2		
3		
4		

SECTION VII: CREDIT (for goat production)

7.1 Nangutang o nanghiram ka ba ng pera para sa iyong pagkakambing? (Did you avail of credit?) _____ (0 – No; 1 – Yes)

7.2 Saan/ mula kanino ka humiram ng pera? (Where/from whom did you borrow money?) _____

1 – Bank 2 – Cooperative 3 – Government Agencies
96 – Other, specify _____

7.3 Magkano ang iyong hiniram? (How much did you borrow?) _____

7.4 Magkano ang interes at iba pang mga singil? (How much is the interest and other charges?)

7.5 Ano ang termino ng pagbabayad? (What is the repayment term?) _____(0 – Installment; 1 – Full Payment)

7.6 Gaano katagal ang termino bago dapat maubos bayaran ang nasabing utang (Maturity of Loans (Months) _____

7.7 Ilang porsyento ng utang ang ginugol sa produksyon ng kambing at mga kaugnay na negosyong pang kambing? (What percentage of the loan was spent on goat production and goat related enterprises?) _____

7.8 Saan mo ginugol o ginasto ang natitirang porsyento? (Where was the remaining percentage spent?) _____

7.9 Enumerate credit-related problems, if any:

7.9a. _____

7.9b. _____

7.9c. _____

SECTION VIII. ORGANIZATIONAL MEMBERSHIPAND INFORMATION ON TRAINING/SEMINAR ATTENDED

8.1 Organizational Membership and Entrepreneurship

8.1.1 Are you a member of any Goat Farmers' Association organized by the SAIS-RED project? _____ 0 – No 1 – Yes

8.1.1.1 If No, why did you not join the Goat Farmers' Association?

_____

_____

8.1.1.2 If Yes, what is the name of the association? _____

8.1.1.3 When was it organized? _____

8.1.1.4 What is your position in the association? _____

8.1.1.5 Is the association still active/ operational? _____0 – No 1 – Yes

8.1.1.6 If No, why is it not active/operational anymore? _____

_____

_____

8.1.1.7 If Yes, what are the current activities of the association (include allied goat-based enterprises? _____

_____

_____

8.1.1.8 Is your Goat Farmers' Association a member of a network/federation? _____ 0 – No 1 – Yes

8.1.1.9 If No, why? _____

8.1.1.10 If Yes, what is the name of the network/ federation (include date of affiliation)? _____

_____

8.1.2 Have you engaged in allied goat-based enterprises as outcome of the SAIS-RED project? ____ 0 – No 1 – Yes

8.1.2.1	8.1.2.2	8.1.2.3	8.1.2.4	8.1.2.5
Goat-Based Enterprises	Year Established	Annual Income Generated (PhP)	Support Received from DA-LGU	Support Received from DA-RFU VIII
1. Legume Plant Material Nursery Enterprise				
2. Slaughter Goat Production Enterprise				
3. Buck for Hire Enterprise				
4. Meat Products Enterprise				

Table 8.1.2 continued. . .

8.1.2.1	8.1.2.2	8.1.2.3	8.1.2.4	8.1.2.5
Goat-Based Enterprises	Year Established	Annual Income Generated (PhP)	Support Received from DA-LGU	Support Received from DA-RFU VIII
5. Goat Breeder Production Enterprise				
6. Dairy Production Enterprise				

8.1.3 Have you or any member of your household been a member of any other organizations? _____ 0 – No 1 – Yes

8.1.3.1	8.1.3.2	8.1.3.3	8.1.3.4
Name of Organization	Type of Organization	Year of Membership	Status of Membership
1			
2			
3			
4			

Codes to Type of Organization (8.1.3.2)

1 – Agriculture related organization/Farmer's Group
2 – Labor organization
3 – Religious organization
4 – Youth organization
5 – Women organization
7 – Political organization
8 – Cooperative
9 – Organization for seniors/ elderly
10 – Health-related organization
11 – Patrol/ peace and order
6 – Men's organization
96 – Other, specify _____

Code to Status of Membership (210)

1 – Adviser/Officer/Board Member
2 – Active Member
3 – Non-Active member
96 – Others, specify _____

8.1.4 Enumerate organization-related problems, if any:

8.1.4a _____

8.1.4b _____

8.1.4c _____

8.2 Other Trainings and Seminars on Livestock Production (provided outside of SAIS-RED Project but inclusive of A-PLP trainings)

8.2.1 Have you or any member of the household attended the any seminar/trainings related to livestock production? _0 – No 1 – Yes

8.2.1.1	8.2.1.2	8.2.1.3	8.2.1.4
Title of Training	Year	Name of Organizer	Type of Training on Livestock Production
1			
2			
3			
4			

Codes to Type of Training (8.2.1.4)

1 – DA-LGU
2 – DA-RFU VIII
3 – PCC
96 –Other, specify

8.2.2 Enumerate training-related problems, if any:

8.2.2a. _____

8.2.2b. _____

8.2.2c. _____

8.2.3 What are the positive impacts in attending both SAIS-RED project and other training? ____

1 - Better quality of off springs
2 - Higher financial gains
3 – Additional knowledge on livestock
4 – Others (specify) _____

8.2.4 Other Services Availed from DA-LGU/ DA-RFU VIII and Other Organizations

8.2.5 Have you availed of other services from DA-LGU/ DA-RFU VIII related to livestock production before 2013? _____ 0 – No 1 – Yes

8.2.5.1	8.2.5.2	8.2.5.3	8.2.5.4	8.2.5.5	8.2.5.6
Type of Service	Livestock Species and Breed	No. of Animals	No. Availed per Year	Service Provider	Impact (Provide details and quantify)
Vaccination/ Drugs and biologics					
Deworming					
Vitamins/ Supplements					
Upgrading of stocks					
Artificial insemination					
Laboratory analysis					
Market linkage					

Codes for Breed (8.2.5.2): 1 – Native 2 – Purebred 3 – Crossbred
Codes for Service Provider (8.2.5.5): 1 – DA-LGU 2 – DA-RFU VIII 96 – Other, specify_____

8.2.6. Have you availed of other services from DA-LGU/ DA-RFU VIII related to livestock production from July 2010 to June 2016? _____ 0 – No 1 – Yes

8.2.6.1	8.2.6.2	8.2.6.3	8.2.6.4	8.2.6.5	8.2.6.6
Type of Service	Livestock Species and Breed	No. of Animals	No. Availed per Year	Service Provider	Impact (Provide details and quantify)
Vaccination/ Drugs and biologics					
Deworming					

Table 8.2.6, continued. . .

8.2.6.1	8.2.6.2	8.2.6.3	8.2.6.4	8.2.6.5	8.2.6.6
Type of Service	Livestock Species and Breed	No. of Animals	No. Availed per Year	Service Provider	Impact (Provide details and quantify)
Vitamins/ Supplements					
Upgrading of stocks					
Artificial insemination					
Laboratory analysis					
Market linkage					

Codes for Breed: 1 – Native 2 – Purebred 3 – Crossbred
Codes for Service Provider: 1 – DA-LGU 2 – DA-RFU VIII 96 – Other, specify_____

SECTION IX: PERSONAL ENTREPRENEURIAL COMPETENCIES (PEC) ASSESSMENT

1. Mga Panuto (Instructions):
   - (This questionnaire consists of 35 brief statements. Read each statement and allow respondent to decide how well it describes him/ her. Encourage the respondent to be honest about himself/ herself. Remember, no one does everything very well).

2. Piliin ang isa sa mga numero na nagsasabi kung gaano ang bawat pangungusap ay naglalarawan sa iyo.
   - (Choose one of the numbers to indicate how well the statement describes you):
     - 5 – Palagi (Always)
     - 4 – Madalas (Usually)
     - 3 – Paminsan-minsan (Sometimes)
     - 2 – Bihira (Rarely)
     - 1 – Hindi kailanman (Never)

3. May mga pangungusap na maaaring magkahawig, subalit walang dalawang pangungusap na talagang Magkatulad.
   - (Some statements may be similar but no two are exactly alike).

4. Sagutin ang lahat ng mga tanong.
   - (Please answer all questions).

9.1 Assessing Entrepreneurial Competencies

9.1.1	9.1.2	9.1.3
No.	Questions	Rating
1	Humahanap ako ng mga trabahong kailangan gawin. (I look for things that need to be done).	
2	Hindi ako mapakali kapag hindi nagagawa nang maayos ang mga trabaho. (It bothers me when things are not done very well).	
3	Mas-ninanais ko ang mga sitwasyon kung saan mas-hawak o kontrolado ko ang kalalabasan. (I prefer situations in which I can control the outcomes as much as possible).	
4	Bago ako magsisimula sa isang gawain o proyekto, kumakalap muna ako ng maraming impormasyon tungkol dito. (When starting a new task or project, I gather a great deal of information before going ahead).	
5	Pinaplano ko ang isang malaking proyekto sa pamamagitan ng paghahati nito sa mas maliliit na gawain. (I plan a large project by breaking it down into smaller tasks).	
6	Hinihingi ko ang suporta ng iba sa aking mga mungkahi. (I get others to support my recommendations).	
7	Kahit sinuman ang aking kausap, ako ay magaling makinig. (No matter whom I'm talking to, I'm a good listener).	
8	Ginagawa ko ang mga kailangan gawin bago pa ipagawa ito sa akin ng iba. (I do things that need to be done before being asked by others).	
9	Ang aking trabaho ay mas maganda o mas mainam kaysa sa mga trabaho ng aking mga kasanggawa. (My own work is better than that of people I work with).	
10	Hindi ko sinusubukan ang isang bagong bagay nang hindi sinisiguro na ako ay magtatagumpay. (I don't try something new without making sure I will succeed).	
11	Humihingi ako ng payo sa mga taong maraming alam tungkol sa mga trabahong aking ginagawa. (I seek the advice of people who know about the tasks I am working on).	
12	Pinag-iisipan ko ang mga maganda at hindi maganda o mga iba't-ibang paraan nang paggawa ng mga bagay (I think about the advantages and disadvantages or different ways of accomplishing things).	
13	Hindi ako naglalaan ng maraming oras sa pag-iisip ng paraan upang maimpluwensyahan ang ibang tao. (I do not spend much time thinking how to influence others).	
14	Masama ang aking kalooban kapag hindi ko nakukuha ang aking gusto. (I feel resentful when I don't get my way).	
15	Gusto ko ang mga pagsubok at mga bagong oportunidad. (I like challenges and new opportunities).	
16	Hindi ako mapakali kapag nasasayang ang aking oras. (It bothers me when my time is wasted).	
17	Tinitimbang ko ang posibilidad na ako ay magtatagumpay o mabibigo bago ko gagawin ang isang bagay (I weigh my chances of succeeding or failing before I decide to do something).	

Table 9.1, continued. . .

9.1.1	9.1.2	9.1.3
No.	Questions	Rating
18	Ako ay kumikilos nang hindi nag-aaksaya ng panahon sa pagkakalap ng impormasyon. (I take action without wasting time gathering information).	
19	Pinag-iisipan ko kung ano ang mga problemang aking maaaring kakaharapin, at pinaplano ko ang aking gagawin kung sakaling ang problema ay mangyayari. (I try to think of all the problems I may encounter and plan what to do if each problem occurs).	
20	Kumukuha ako ng mga importanteng tao na makatulong sa pagtupad ng aking mga hangarin/ mithiin. (I get important people to help me accomplish my goals).	
21	Ako ay nakaranas na ng pagkabigo sa nakaraan. (In the past, I have had failures).	
22	Mas gusto ko ang mga gawaing alam na alam kong gampanan, at kung saan ako komportable. (I prefer activities that I know well and with which I am comfortable).	
23	Hindi ako lubusang masaya o kuntento kung papaano nagagawa ang isang bagay; palagi kong iniisip na may mas maganda o mas mabuting paraan upang magawa ito. (I'm never entirely happy with the way in which things are done; I always think that there must be a better way).	
24	Ginagawa ko ang mga bagay na may kaakibat na panganib. (I do things that are risky).	
25	Kapag gumagawa ako ng proyekto para sa isang tao, marami akong katanungan ukol dito upang masiguro na naiintindihan ko ang nais ng taong nagpapagawa ng proyektong ito. (When working on a project for someone, I ask many questions to be sure I understand what that person wants).	
26	Hinaharap ko ang mga problema sa oras na ang mga ito'y dumating sa akin, sa halip na maglaan ng oras sa pag-iisip kung anong mga posibleng problema ang maaaring mangyari. (I deal with problems as they arise, rather than spend time trying to anticipate them).	
27	Upang makamit ang aking mga layunin, umiisip ako ng mga solusyon na makakatulong sa lahat ng nauugnay sa isang problema. (In order to reach my goals, I think of solutions that benefit everyone involved in a problem).	
28	May mga pagkakataong naging mapagsamantala ako sa ibang tao. (There have been occasions when I took advantage of someone).	
29	Sumusubok ako ng mga bagay na bago at kakaiba kaysa sa mga dati ko nang nagawa. (I try things that are very new and different from what I have done before).	
30	Humahanap ako ng mga paraan upang mas mapabilis ang pagtapos ng aking mga gawain sa bahay at sa trabaho. (I find ways to complete tasks faster at work and at home).	
31	Ginagawa ko ang mga bagay na sa tingin ng iba ay mapanganib. (I do things that others consider risky).	
32	Kumakalap ako ng impormasyon sa iba't-ibang maaaring pagkukunan nito upang matulungan ako sa aking mga gawain o proyekto. (I go to several sources to get information to get help with tasks or projects)	

Table 9.1, continued. . .

9.1.1	9.1.2	9.1.3
No.	Questions	Rating
33	Kapag ang isang solusyon sa problema ay hindi nagging matagumpay, umiisip ako ng ibang paraan upang malutas ang problemang ito. (If one approach to a problem does not work, I think of another approach).	
34	Nakukumbinsi ko sa aking panig ang mga taong may matitibay na pananaw o kuru-kuro. (I am able to get people who have strong opinions or ideas to change their minds).	
35	Kapag may hindi ako alam na bagay,hindi ako nahihiyang amin ito. (When I don't know something, I don't mind admitting it).	

SECTION X. ADDITIONAL INFORMATION FOR SAIS-RED FARMER-BENEFECIARIES

10.1 Do you think that the project implementers of SAIS-RED perform well in delivering their services? _____ 0 – No 1 – Yes

10.2 Why do you say so? _____

_____

10.3. How did you become involved with the SAIS-RED project? _____

_____

_____

10.4. What services have you accessed from the SAIS-RED project (i.e. training/ capability building activities, breeder animal/ service of breeder animal, forage/ pasture planting materials, technical assistance, production inputs, etc.)?_____

_____

_____

10.5. From your point of view, describe the most significant change that has resulted from your involvement with the SAIS-RED project. _____

_____

_____

10.5.1 Why is this change significant to you? _____

_____

_____

10.5.2 What difference has this made now or will it make in the future?_____

_____

_____

_____

10.5.3 What are the observable evidences that can support or substantiate your "change stories"?_____

_____

_____

10.6. Would you recommend this kind of project to others?_____0 – No 1 – Yes)

10.6.1 If yes, explain _____

_____

_____

10.6.2 If no, explain_____

10.7. How do you assess the success of the SAIS-RED project? _____

10.7.1 High, explain _____

10.7.2 Moderate, explain _____

10.7.3 Low, explain _____

10.8. Do you have any suggestion(s) to further improve the implementation of SAIS-RED project? _____ 0 – No 1 – Yes

10.8.1 If yes, explain _____

Thank You Very Much!!!

Annex 4. Questionnaire for the MBLP

CONFIDENTIALITY: The Interviewer takes the responsibility in guarding the confidentiality of all the information generated through this instrument.	**IMPACT EVALUATION OF THE AGRI-PINOY LIVESTOCK PROGRAM (A-PLP) –Male Breeder Loan Program**

ID:		Enumerator:	Coordinator:
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 Agri-Pinoy Livestock Program (A-PLP) which was implemented by the Department of Agriculture Regional Field Office VIII and Local Government Unit (LGU) in your area. Your household has been randomly selected as respondent to represent the Male Breeder Loan Program 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 1: RESPONDENT'S INFORMATION

1 Personal Information and Socio-economic Characteristics

1.1.1 Type of Loaned Breeder Animal: _____

1 – Carabull; 2 – Bull; 3 – Buck; 4 – Ram

1.1.2 Date Received (month and year): _____

1.2 Household Address

1.2.1 Purok/Sitio : _____

1.2.2 Barangay : _____

1.2.3 Municipality : _____

1.2.4 Province : _____

1.3 Name of Respondent

1.3.1 First Name : _____

1.3.2 Middle Name : _____

1.3.3 Last Name : _____

1.3 Age : _____

1.5 Gender : _____ (1 – Male; 2 – Female)

1.6 Civil Status : _____
(1- Single; 2 – Married; 3 – Widowed; 4 – Separated/Divorce; 5 – Live-in)

1.7 Number of years in school: _____ (please refer to code for Education (**13**) found on page 2 for the household profile)

1.8 Contact Number : _____

SECTION II. HOUSEHOLD CHARACTERISTICS

2.1 Household Profile

2.1.1	2.1.2	2.1.3	2.1.4	2.1.5	2.1.6	2.1.7	2.1.8	2.1.9	2.1.10
Who are the members of this household? (list in this order) Family Name, First Name	Relationship to Household Head	Age	Sex	Civil Status	Education	Presently Attending School?	Type of School	Occupation	
								Primary	Secondary
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
10.									

Codes to Relationship to HH (2.1.2)

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
96 – Other Relative

Codes to Sex (2.1.4)

1 – Male
2 – Female

Codes for Education (2.1.6)

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 (2.1.9/2.1.10)

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) _____

Code to Civil Status (2.1.5)

1 – Single
2 – Married
3 – Widowed
4 – Separated/Divorce
5 – Live-in

Code to Attending School (2.1.7)

0 – No
1 – Yes

Code to Type of School (2.1.8)

1 – Public
2 – Private

2.2 Income and Employment Profile

2.2.0	2.2.1	2.2.2	2.2.3	2.2.4
Sources of Income	Number of Members in the Family Who are Involved		Estimated Income per Year Earnings/ Income	
	Before (2010)	2017	Before (2010)	2017
Farm Income				
Carabao				
Bull/Cow/Cattle				
Goat				
Sheep				
Buck				
Pig				
Poultry				
Rice				
Coconut				
Vegetables				
Root crops				
Banana				
Others (specify)				
Sub-Total (to be computed)				
Off-farm Income				
Planting				
Plowing				
Weeding				
Other, specify _____				
Sub-Total (to be computed)				
Non-farm Income:				
Sub-Total (to be computed)				
Other sources:				
Sub-Total (to be computed)				
TOTAL (to be computed)				

Code to Non-farm Income:

1 – Salaried employment in private sector
2 – Salaried employment in government
3 – Honorarium
4 – Business (sari-sari store, etc.)
5 – Fishing

Code to Other Sources:

1 – Remittance received (Domestic & Foreign)
2 – Pension, retirement & other similar benefits
3 – Assistance from a government welfare program (e.g., CCT, 4Ps)
4 – Assistance from government officials
5 – Assistance from relatives and friends
6 – Prizes received (raffle, gambling, etc.)

2.3 Information on Dwelling Place

2.3.1	2.3.2	2.3.3	2.3.4	2.3.5	2.3.6	2.3.7
Period	House Ownership	Toilet Facility	Water Supply	Uses of Water	Distance from the House of the Water Source (meter)	Description of dwelling place
Before (2010)						
2017						

Code for House Ownership (2.3.2)	Codes for Toilet Facility (2.3.3)	Codes for Water Supply (2.3.4)	Codes for Uses of Water (2.3.5)
1 – Owned 2 – Rented 3 – Living with others 96 – Others, (specify)_____	1 – Flush 2 – Pour 3 – Antipolo type 4 – None 96 – Others (specify)_____	1 – Private water connection/piped-in 2 – Water pipes/tanks provide by the government and other groups 3 – Refilling Station 4 – Mineral Water from Stores 5 – Spring Water (Tubod) 6 – Rain Water 7 – Well water (Tabay)	1 – Drinking only 2 – Cooking only 3 – Domestic used only 4 – Drinking & Cooking 5 – Drinking, cooking, and domestic used

2.4 Household/ Farm Assets and Vehicles

2.4.0	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5
Code	Item name	Qty	Value (Purchase price in PhP)	Year purchased	Where did you obtain the money used to buy this item?
Household Assets					
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				
12	Other, specify				
Farm and Livestock Assets					
13	Plow				
14	Tractor				
15	Water pump				
16	Carabao				
17	Cattle				
18	Goat				
19	Sheep				
Vehicles					
21	Bicycle				
22	Pedicab				
23	Motorcycle or Scooter				
24	Tricycle				
25	Car/Jeep				
26	Pick-up/Truck				
27	Pump boat				
28	Non-motorized Banca				
29	Other, specify				

SECTION III. FARM AND ENTERPRISE CHARACTERISTICS

3.1 Years of livestock raising and forage/ pasture establishment

3.1.1	3.1.2	3.1.3	3.1.4a	3.1.4b
Animal type	Number of years livestock raising	Total area used for raising livestock species (grazing, etc.) (ha)	Out of the total area used for raising livestock, how much is planted to forage/ pasture (ha)? Indicate if area is commonly used by more than one species.	
			Before (2010)	2017
Carabao				
Cattle				
Sheep				
Goat				
Swine				
Chicken				
Other, specify				
Total Area Devoted to Forage/ Pasture (ha)				

3.2 Infrastructural Distance and Accessibility

3.2.1	3.2.2	3.2.3	3.2.4
Lokasyon (Location)	Distance (km)	(Dominant Mode of Transportation)	(Dominant Type of Road)
Sakahan papunta sa pinakamalapit na kalsada (Farm to nearest road)			
Sakahan papuntang tirahan (Farm to residence)			
Sakahan papuntang merkado (Farm to output market)			
Sakahan papuntang bilihan ng inputs (Farm to inputs supply)			

Code to Mode of Transportation (3.2.3)
1 – Maglakad (Walk)
2 – Pagsakay sa mga hayop (Riding animals (horse, cow or carbao)
3 – Bisikleta (Bicycle)
4– Motorsiklo/Tricycle (Motorcycle/Tricycle)
5 – Public Bus/Jeepney
6 – Sarling sasakyan (Own vehicle)
96 – Iba pa Other, (Specify) _____

Code to Type of Road (3.2.4)
1 – Sukal na daan (Dirt road)
2 – Kaskaho na daan/Lahat ng panahon (Gravel/All-weather)
3 – Aspalto (Asphalt)
4 – Kongkreto (Concrete)
96 – Iba pa (tukuyin) Other (specify): _

3.3 Purpose of Raising Livestock

3.3.1	3.3.2	3.3.3	3.3.4	3.3.5
Livestock Species	What was your purpose of raising livestock? Before (2010)	Importance of Species (Rank)	What is your purpose of raising livestock? Present	Importance of Species (Rank)
Carabao/ Cattle				
Goat/ Sheep				
Swine				
Chicken				
Other, specify _____				

3.4 Livestock Inventory, Mortality and Morbidity (2010 and 2017) (For species the same as the loaned male breeder only)

3.4.1	3.4.2	3.4.3	3.4.4	3.4.5	3.4.6	3.4.6	3.4.7	3.4.8	3.4.9	3.4.10	3.4.11	3.4.12	3.4.13	3.4.14	3.4.15	3.4.16
Animal Type	Before (2010)								2017							
	# of Head	Acquisition Cost/Value	Breed	Source	# of Death	Mortality (%) (to be computed)	No. of Sick Animals	Morbidity (%) (to be computed)	# of Head	Acquisition Cost/Value	Breed	Source	#. of Death	Mortality (%) (to be computed)	No. of Sick Animals	Morbidity (%) (to be computed)
Mature* female																
Mature male																
Young female																
Young male																

* Sexually mature

Code to Source (3.4.5/3.4.12):
1 – Own produce
2 – Bought
3 – Barter
4 – Given
5 – Availed for a loan
6 – Dispersal
96 – Other, specify _____

Code to Breed (3.4.4/3.4.11):
1 – Native
2 – Crossbred
3 – Purebred

3.5 Investments made for _____ (for the same species as the loaned male breeder) production

3.5.1	3.5.2	3.5.3	3.5.4	3.5.5	3.5.6
Items	Description	Total Cost	Year Established/ Acquired	Estimated Life Span	Source of Capital*
Housing (materials and labor)					
Foundation Stock – Female breeder animal				-99	
Foundation Stock – Male breeder animal				-99	
Perimeter fence (barb wire and fence post)					
Tools and equipment					
Pasture development (including cost of planting materials, labor and other costs of establishment)				-99	
Other, specify _____ _____					
*Source of Capital (3.5.6): 1 – Owned 2 – Borrowed 3 – Grant 96 – Other, specify _____					

3.6 Annual depreciation cost (to be computed): _____

SECTION IV. MALE BREEDER LOAN PROGRAM (MBLP) SCENARIO

4.1 Before Scenario

4.1.1 Before you received the _____ (name of male breeder animal), what animals did you have? (Can have multiple responses) _____

1 – Caracow/ heifer; 2 – Carabull; 3 – Heifer ; 4 – Bull; 5 – Ewe; 6 – Ram; 7 – Doe; 8 – Buck

4.1.2 What are their breeds (fill up only applicable animal)? _____

1 – Native 2 – Purebred 3 – Crossbred

4.1.2.1 Caracow: ____ 4.1.2.4 Carabull: ___ 4.1.2.7 Heifer: _____

4.1.2.2 Bull : _____ 4.1.2.5 Ewe : _____ 4.1.2.8 Ram : _____

4.1.2.3 Doer : _____ 4.1.2.6 Buck : _____

4.1.3 If you did not have a carabull/ bull/ ram/ buck, where did you usually breed your female animals? _____

1 – In the barangay; 2 – Other barangay; 3 – Other towns;
96 – Other, specify ___

4.1.4 Distance of the location of carabull/ bull/ ram/ buck used in breeding your female animal? _____(in km)

4.1.5 Before the Male Breeder Loan Program, what breed was the _____ (for the same species as the loaned male breeder animal) used in breeding your female animal?

1 – Native; 2 – Purebred; 3 – Crossbred; 96 – Other, specify _____

4.1.6 Before the Male Breeder Loan Program, how easy/ difficult was it to look for carabull/ bull/ ram/ buck? _____

1 – Very easy; 2 – Easy; 3 – Difficult; 4 – Very difficult

4.1.7 Before the Male Breeder Loan Program, where did other animal raisers in the barangay breed their female animals (for the same species as the loaned male breeder animal)?_____

1 – In the barangay; 2 – Other barangay; 3 – Other towns
96 – Other, specify _____

4.1.8 Before the Male Breeder Loan Program, what type of male breeder did other animal raisers in the barangay use to breed their female animals (for the same species as the loaned male breeder animal)? _____

1 – Native; 2 – Purebred; 3 – Crossbred; 96 – Other, specify _____

4.1.9 Before the Male Breeder Loan Program implementation, how many _____ (for the same species as the loaned male breeder animal) were there in the barangay (both adult and young)?

4.1.9.1 Native : _____

4.1.9.2 Purebred : _____

4.1.9.3 Crossbred :_____

4.2 Male Breeder Loan Program Scenario

4.2.1 From where did you learn about the Male Breeder Loan Program? _____

1 – DA-LGU 2 – PCC 3 – Neighbors/ friends
4 – Agricultural technician 96 – Other, specify _____

4.2.2 Agency that facilitated the male breeder animal loan: _____

a. – DA-LGU 2 – DA-RFU VIII 96 – Other, specify _____

4.2.3 Who initiated your availment of the male breeder animal?_____

1– You approached the Agriculture Office/LGU to apply for the male breeder animal loan

2 – The Agriculture Office/LGU identified and directed you to apply for the male breeder animal loan

3 – Your association identified and directed you to apply for the male breeder animal loan

96 – Other, specify _____

4.3 Describe the process involved in the availment of the male breeder loan of _____ (for the same species as the loaned male breeder animal).

4.3.1	4.3.2	4.3.3	4.3.4	4.3.5
Qualifications	Requirements	Procedure	Obligations	
			Repayment	Responsibilities

4.4 Information on the loaned male breeder animal

4.4.1	4.4.2	4.4.3	4.4.4	4.4.5	4.4.6	4.4.7
Source	Breed	Age	Year Received	Year When 1st Used as Breeder	Year When Last Used as Breeder	Present Status

Code to Source of Male Breeder (4.4.1)	Code to Breed (4.4.2)	Code to Present Status (4.4.7)
1– PCC 2– Cooperative 3– DA-LGU 4– DA-RFU 5 – Other raisers 96 – Other, specify: _____	1 – Native 2 – Crossbred 3 – Purebred 96- Other, specify _____	1 – Sold 2 – Slaughtered 3 – Died 4 - Active 5– In-active 6– Lost 96– Other, specify .

4.4.8 From where were the female animals bred by your loaned male breeder animals?_____

1 – Own farm; 2 – Within the barangay; 3 – Other barangay;
96 – Other, specify _____

4.5 Information of the male breeder animal that was SOLD or SLAUGHTERED?

4.5.1	4.5.2	4.5.3	4.5.4	4.5.5	4.5.6	4.5.7
Sold Alive (1) or Slaughtered (2)?	When? (month and year)	How Much?	Age	Weight	Reason(s) for Selling/ Slaughtering	Where Sold?

4.5.8 Are there any other male breeder animals in your barangay at present (for the same species as the loaned male breeder animal)? _____ (1 – Yes 0 – No)

4.5.8.1 If Yes, how many? _____

4.5.8.2 What breed? 1 – Native 2 – Crossbred 3 – Purebred

4.5.9 Is there a technician giving AI service in your barangay? _____ (1 – Yes 0 – No)

4.5.9.1 If YES, Name of AI Technician: _____

4.5.9.2 If YES, Type of AI Technician: ____

1 – PCC technician 2 – LGU technician 3 – VBAIT

4.6 If male breeder animal died, when did it die?

4.6.1 Year : _____ 4.6.2 Month : _____

4.6.3 What was the cause of death? _____

4.6.4 Did you pay the DA-LGU/ DA-RFU VIII for the dead male breeder? _____

0 – No; 1 – Yes

4.6.4.1 If YES, how much? (PhP) _____

4.6.4.2 If NO, why not? _____

4.6.5 If male breeder animal died, did you get replacement from DA-LGU/ DA-RFU VIII? _____ 0 – No 1 – Yes

4.6.5.1. If NO, why not? _____

4.6.5.2. If YES, how long did it take to get replacement? _____

4.6.6 If the dead male breeder animal was replaced, did you pay for the replacement of the dead male breeder? _____ 0 – No 1 – Yes

4.6.5.1. If YES, how much? PhP_____

4.6.5.2. If NO, why not? _____

4.7 Were there differences in characteristics of the loaned male breeder animal and your other animals? _____ (1-Yes, 0 -No)

4.7.1 If Yes, what were the differences (e.g. size/weight; temperament – ease in handling/docile or wild?)

4.7.1.1	4.7.1.2	4.7.1.3
Characteristics	Loaned Male Breeder Animal	Owned/ Other Animals
a) Size/ weight		
b) Feed requirement		
c) Temperament/ ease in handling		
d) Other, specify		

4.8 Were there differences in the management of the loaned male breeder animal and your other animals? _____ (1-Yes, 0 -No)

4.9 If Yes, what were the differences?

4.9.1	4.9.2	4.9.3
Management Practice/s	Loaned Male Breeder Animal	Owned/ Other Animals
Housing		
Feeding		
Breeding		
Health		

4.10 What benefits did you obtain from availing of the male breeder animal? (Please quantify)

4.10.1	4.10.2
Benefit	Describe and Quantify

4.11 Were there differences in the performance of the LOANED MALE BREEDER ANIMAL and your owned/ other animals? _____ (1-YES, 0 -NO)

4.12 If Yes, what were the differences (size; rate of growth; ease in feeding; feed consumed – both amount and types of feed; capacity to work– for carabaos)?

4.12.1	4.12.2	4.12.3
Performance Characteristics	Loaned Male Breeder Animal	Owned/ Other Animals
a) Size b) Rate of growth c) Ease in feeding d) Amount of feed consumption e) Type of feed consumed f) Capacity to work (as draft animal – for carabao) g) Other, specify		

4.13 Were there differences in the performance of the loaned male breeder's OFFSPRING and your other animals? _____ (1-Yes, 0 -No)

4.14 If Yes, what were the differences (size; rate of growth; ease in feeding; feed consumed – both amount and types of feed; capacity to work– for carabaos). DIFFERENTIATE in QUANTITATIVE TERMS.

4.14.1	4.14.2	4.14.3
Performance Characteristics	Loaned Male Breeder's OFFSPRING	Owned/ Other Animals
a) Size		
b) Rate of growth		
c) Ease in feeding		
d) Amount of feed consumption		
e) Type of feed consumed		
f) Capacity to work (as draft animal – for carabao)		
g) Other, specify		

4.15 Did you have problems that were inherent only to the LOANED MALE BREEDER and NOT with your other animals? _____ (1-Yes, 0 -No)

4.16 If Yes, what were these problems; (e.g. difficult to handle; difficult to or selective with, feed; easily get sick; does not work– for carabaos). DIFFERENTIATE in QUANTITATIVE TERMS.

4.16.1	4.16.2	4.16.3
Difficult Characteristics	Loaned Male Breeder	Owned/ Other Animals
a) Difficult to mate		
b) Selective with feed		
c) Easily gets sick		
d) Cannot be used as draft animal (in the case of carabao)		
a) Other, specify		

4.17 Did you have problems that were inherent only to the loaned male breeder's OFFSPRING and NOT with your other animals? _____ (1-Yes, 0 -No)

4.18 If Yes, what were these problems; (e.g. difficult to handle; difficult to or selective with, feed; easily get sick; does not work– for carabaos). DIFFERENTIATE in QUANTITATIVE TERMS.

4.18.1	4.18.2	4.18.3
Problems	Loaned Male Breeder's OFFSPRING	Owned/ Other Animals
a) Difficult to handle		
b) Selective with feed		
c) Easily gets sick		
d) Cannot be used as draft animal (in the case of carabao)		
e) Other, specify		

SECTION V. MANAGEMENT PRACTICES FOR THE ANIMALS

5.1 Feeds and Feeding System (only for same species as the loaned male breeder)

5.1.1 Feeding System

5.1.1.1	5.1.1.2	5.1.1.3
PRACTICES	Describe Practice	
	Before (2010)	2017
Type of Grazing		
Tethering (tugway) – where, how many times transferred		
Free-grazing (let -loose inside fenced pasture)		
Rotational grazing (inside fenced pasture divided into padlocks)		
Time devoted to grazing (hours per day)		
Was the animal given cut feed or concentrate? 0 – No 1 – Yes		

Previous table 5.1.1, continued. . .

5.1.1.1	5.1.1.2	5.1.1.3
PRACTICES	Describe Practice	
	Before (2010)	2017
Was the animal housed or confined? 0 – No 1 – Yes		
If Yes, what type of confinement? 1 – Partial 2 – Pure		
Partial confinement		
Pure confinement, year-round (Stall feeding)		
Frequency of feeding per day (cut feed or concentrate)		
Type of feed (For Pure and Semi-Confinement)		
Roughage		
Grasses		
Crop by-product (rice straw, corn stover, etc.)		
Legumes (kakawati, ipil-ipil, centrosema, rensonii, etc.)		
Tree leaves (banana, guava, jackfruit, etc.)		
Concentrates (commercial feeds including rice bran)		
Supplements (salt, molasses, milk replacer, etc.)		
Silage		
Other, specify		

5.1.2. What forage and pasture species did you plant/ utilize for your loaned male breeder?

_____

_____

5.1.3. Are these forage species also fed to other animals? _____ 0 – No 1 – Yes
If YES, which animals? _____

5.1.4. Source of planting materials: _____
1 – DA Satellite Stations 2 – Other farmers 96 – Other, specify
_____

5.1.5. Do you use fertilizer for your forages (including use of manure)? _____
0 – No 1 – Yes

If NO, why? _____

If YES, to what forages do you apply said fertilizer? _____

5.1.6. Did you feed your loaned male breeder with other agricultural products (rice straw, stover, etc.) available on your farm? (Encircle answer)

0 – No, why not? _____ 1 – Yes, specify products used _____

5.1.7. Problems Experienced in Feeding Loaned Breeder and Solutions to the Problems

5.1.7.1	5.1.7.2	5.1.7.3
Problems Encountered in Feeding	Month/ Period Problem is Usually Experienced	Solution to the Problem
Feed available is not enough		
Feed available has low quality		
Animal is very selective of feed		
No money to buy concentrates		
High price of concentrates		
No available concentrates in the barangay		
Other, specify _____		

5.2. Health Management (only for the same species as the loaned male breeder)

5.2.1 Health Management Practices

5.2.1.1	5.2.1.2	5.2.1.3	5.2.1.4	5.2.1.5	5.2.1.6	5.2.1.7	5.2.1.8	5.2.1.9	5.2.1.10	5.2.1.11
TYPE	Before (2010)					2017				
	How Often	What were Used	Quantity Used	Source	Cost	How Often	What were Used	Quantity Used	Source	Cost
Vaccination against • Hemorragic septicemia • Foot and Mouth Disease (FMD)										
Fecalysis										
Deworming w/ chemicals										
Deworming w/ herbal dewormers										
Mange control ("galis")										
Delousing or Deticking										
Disinfection										
Administration of vitamins (ADE, B-complex)										
Other, specify:										

Code to Frequency (5.2.1.2/5.2.1.7)

1 – Weekly
2 – Monthly
3 – Quarterly
4 - Annually
5 – Only when needed
96 – Other, specify

Code to Source (5.2.1.5/5.2.1.10)

1 – Own produce
2 – Bought
3 – PCC
4 – Fellow farmer
5 – DA-LGU
96 – Other, specify _____

5.2.2 Health-Related Problems Encountered with Male Breeder Animal (specify species): _____

5.2.2.1	5.2.2.2	5.2.2.3
Health Problems	Rank	How was the Problem Controlled or Avoided?
Disease		
FMD		
Surra		
Hemorrhagic Septicemia		
Other, specify _____		

Previous table 5.2.2, continued . . .

5.2.2.1	5.2.2.2	5.2.2.3
Health Problems	Rank	How was the Problem Controlled or Avoided?
Respiratory Disease		
Pneumonia		
Tuberculosis		
Digestive Disorder		
Scouring		
Bloat		
Hardware disease		
Parasitism		
Internal		
External		
Lameness		
Accident		
Poisoning		
Other, specify _____		

5.3. Breeding Performance and Strategies

5.3.1 Breeding Management Applied for the Loaned Male Breeder (specify): _____

5.3.1.1	5.3.1.2
Breeding Management	Describe the Management
Male breeder training and exercise	
Inspection of male breeder and animals to be bred	
Time of day male breeder is allowed to mount	
Keeping of breeding records	

5.3.2 Other Breeding Practices. (only for the same species as the loaned male breeder)

5.3.2.1	5.3.2.2	5.3.2.3	5.3.2.4	5.3.2.5	5.3.2.6
How many times did your male breeder animal provide breeding service?			What month is the peak season for breeding?	What is the success rate of your male breeder at first mating?	Normally, how many times breeding before the female animal is successfully impregnated?
In a day	In a week	In a month			

Code to Success During 1st Mating (5.3.2.5)
1 – Always successful
2 – Sometime successful
3 – Rarely successful
4 – Never successful

Code to No. of Breeding Before Female Successfully Impregnated (5.3.2.6)
1 – 1st breeding
2 – 2nd breeding
3 – 3rd breeding
4 – Other, specify _____

5.3.3. Were there females served by your breeder that needed rebreeding/re-mating? _____(0 –No 1 – Yes)

5.3.3.1 If Yes, how many times? _____ 1 – Once 2 – Twice 3 – Thrice or more

5.3.4. When did you experience this need for re-breeding/ re-mating? _____

1 – When male breeder was young 3 – Until now

2 – Usually with heifers 96 – Other, specify _____

5.3.5. What time of the day do you allow your male breeder to mount females? _____

1 – before 8AM
2 – between 8AM and 4PM
3 – after 4PM until night time

5.3.6. Do they pay for the loaned male breeder service? _____ 0 – No 1 – Yes

5.3.6.1 If Yes, specify terms and amount _____

5.3.6.2 If No, why not?_____

5.3.7 If male breeders other than the loaned animal is used for breeding, are they also being paid? _____ 0 – No 1 – Yes

5.3.7.1 If Yes, how much? PhP_____

5.3.7.2 What are other conditions? _____

5.4 Performance of Male Breeder Animal by Type of Animal Serviced

5.4.1	5.4.2	5.4.3	5.4.4	5.4.5	5.4.6	5.4.7	5.4.8	5.4.9	5.4.10	5.4.11	5.4.12	5.4.13	5.4.14
Male Breeder		NATIVE FEMALE ANIMAL				CROSSBRED FEMALE ANIMAL				PUREBRED FEMALE ANIMAL			
	Type of Loaned Animal	No. of Services	No. of Female Impregnated	No. of Calves Produced	No. of Female Calves Produced	No. of Services	No. of Female Impregnated	No. of Calves Produced	No. of Female Calves Produced	No. of Services	No. of Female Impregnated	No. of Calves Produced	No. of Female Calves Produced
Male Breeder 1													
Year 1													
Year 2													
Year 3													
Year 4													
Year 5													
Year 6													
Year 7													
Male Breeder 2													
Year 1													
Year 2													
Year 3													
Year 4													
Year 5													
Year 6													
Year 7													
Total													

Code to Type of Animal (5.4.2)
1 – Carabull 2 – Bull 3 – Buck 4 – Ram 96 – Other, specify _____

5.5 Information about the Female Animal Served by the Loaned Male Breeder Animal: _____

5.5.1	5.5.2	5.5.3	Code to Breed of Female Animals (5.5.2) 1 – Native 2 – Purebred 3 - Crossbred
Name of Owner of Served Female Animal	Breed of Female Animal	Address	

SECTION VI. ANNUAL REVENUE AND COST

6.1. Annual Revenue from Sales of Stock Note: Only for the same species as the loaned male breeder.

6.1.1	6.1.2	6.1.3	6.1.4	6.1.5	6.1.6	6.1.7	6.1.8	6.1.9	6.1.10	6.1.11	6.1.12	6.1.13	6.1.14	6.1.15
Revenue Item	Annual Average Before 2010							Annual Average from Year Loaned Until 2017						
	No. of Head	Average Age (Years)	Total Weight (kg)	Price/Unit (PhP)	Total Sales (PhP) (to be computed)	Market Outlet	Reasons for Selling/ Slaughtering	No. of Head	Average Age (Years)	Total Weight (kg)	Price/Unit (PhP/Unit)	Total Sales (PhP) (to be computed)	Market Outlet	Reasons for Selling/ Slaughtering
Sold Live														
Sold Slaughtered														
Total (to be														
Other use (Fiestas,														
Home consumption														

Code to Market Outlet (6.1.7/6.1.14)
1 – trader or middleman
2 – auction market
3 – walk in consumers
4 – directly to farmers
96 – Others (Specify) _____

6.2 Status of Farmer-Beneficiary's Animals Including Offspring Produced with Loaned Male Breeder from Start of Loan to December 2017

6.2.1	6.2.2	6.2.3	6.2.4	6.2.5	6.2.6	6.2.7	6.2.8	6.2.9	6.2.10	6.2.11	6.2.12	6.2.13
Animal No.	Offspring of MBLP? 0 – No 1 - Yes	Sex	Year of Birth	Breed of Mother	Status of Offspring (please check)				Year Sold/Sl/Died	Age Sold/Sl/Died	Income (PhP)	Reason for Sale/ Slaughter/ Death
					Sold	Slaughtered (Sl)	Died	Still Raised				
Code to Breed of Mother (6.2.5) 1 – Native 2 – Purebred 3 - Crossbred												

6.3 Before you availed of the loaned breeder animal, were you able to sell _____ (for the same species as the loaned male breeder)? _____

0 - No 1 – Yes

If Yes,

6.3.1 How often did you sell? : _____ 6.3.2 What age is animal sold?: _____ 6.3.3 How much? :_____

6.4 Annual Revenue from Services Animals Note: Only for the same species as the loaned male breeder.

6.4.1 Did you earn income from your own animal and loaned male breeder animal? _____ 0 – No 1 – Yes

6.4.1.1	6.4.1.2	6.4.1.3	6.4.1.4	6.4.1.5	6.4.1.6	6.4.1.7	6.4.1.8	6.4.1.9	6.4.1.10	6.4.1.1
Revenue Item	Annual Average from Own Animal Before 2010					Annual Average from Male Breeder Animal from Year Loaned Until 2017				
	No. of times Hired/Year	Unit	Qty/Year	Rate/Unit	Total Income (to be computed)	No. of times Hired/Year	Unit	Qty/Year	Rate/Unit	Total Income (to be computed)
Animal Service										
Used as Draft										
Male Breeder Service										
Sub-Total (to be										

Table 6.4 1, continued. . .

6.4.1.1	6.4.1.2	6.4.1.3	6.4.1.4	6.4.1.5	6.4.1.6	6.4.1.7	6.4.1.8	6.4.1.9	6.4.1.10	6.4.1.11
Revenue Item	Annual Average from Own Animal Before 2010					Annual Average from Male Breeder Animal from Year Loaned Until 2017				
	No. of times Hired/Year	Unit	Qty/Year	Rate/Unit	Total Income (to be computed)	No. of times Hired/Year	Unit	Qty/Year	Rate/Unit	Total Income (to be computed)
Other Product										
Manure										
Sub-Total (to be										
Other Income Related to										
Urea-molasses mineral										
Urea-molasses 42.9										
Forage/ pasture										
Forage/ pasture										
Other, specify _____										
Sub-Total (to be										
TOTAL (to be computed)										

6.5 Annual Revenue from Milk Production (For the same species as the loaned male breeder animal)

6.5.1	6.5.2	6.5.3	6.5.4	6.5.5	6.5.6	6.5.7	6.5.8	6.5.9	6.5.10	6.5.11	6.5.12	6.5.13	6.5.14	6.5.15	6.5.16
Breed of Animal	Annual Average Before (2010)							Annual Average from Year Loaned Until 2017							
	Calving Date	Ave. Milk Produced / Day (li)	Lactation Period (no. of days)	Total Milk Produced/ Year (li)	Total Volume of Milk Sold (li)	Price / Liter (PhP)	Total Sales of Milk (PhP) (to be computed)	Breed of Animal	Calving Date	Ave. Milk Produced / Day (li)	Lactation Period (no. of days)	Total Milk Produced / Year (li)	Total Volume of Milk Sold (li)	Price / Liter (PhP)	Total Sales of Milk (PhP) (to be computed)

Code to Breed of Animal (6.5.1/6.5.9):
1 – Native; 2 – Purebred; 3 – Crossbred

6.6 Cost of Labor. Only for the same species as the loaned male breeder.

6.6.1	6.6.2	6.6.3	6.6.4	6.6.5	6.6.6	6.6.7	6.6.8	6.6.9	6.6.10	6.6.11	6.6.12	6.6.13
Labor Inputs	Annual Average Before 2010						Annual Average from Year Loaned Until 2017					
	Unit	Quantity Labor			Rate/ Unit	Total Cost (to be computed)	Unit	Quantity Labor			Rate/ Unit	Total Cost (to be computed)
		Hired	Family	Total				Hired	Family	Total		
Labor												
Farm maintenance (animal and pasture area)												
Housing maintenance (repair, cleaning and												
Land preparation for pasture												
Planting of pasture												
Other, specify _____												
Feeding												
Herding												
Tethering												
Gathering of feeds												
Giving of feeds and water												
Male Breeder handling during mating												
Male Breeder training and exercise												
Bathing												
Labor												
Milking Collection												
Cleaning and waste management												
Record-keeping												
Other, specify _____												

6.7 Materials and Other Inputs. Only for the same species as the loaned male breeder.

6.7.1	6.7.2	6.7.3	6.7.4	6.7.5	6.7.6	6.7.7	6.7.8	6.7.9	6.7.10	6.7.11
Production Inputs that are Purchased	Annual Average Before 2010					Annual Average from Year Loaned Until 2017				
	Unit	Qty	Unit Price (PhP)	Total Cost (PhP) (to be computed)	Source/ Provider	Unit	Qty	Unit Price (PhP)	Total Cost (PhP) (to be computed)	Source/ Provider
Roughage (e.g grasses, napier, guinea, paragrass)										
Legumes (e.g kakawati, Ipil-ipil,cetrocema, Trichantera, rensonii										
Tree Leaves (Mangga, Banana, Guava, Jackfruit)										
Concentrates (Commercial Feeds, Starter, Grower Mash, Dairy Concentrate, corn, copra mela, rice bran)										
Supplements (Salts, Dicalphos, Mineral block, Molasses, Milk Replacer)										
Silage										
Other, specify: _____										
Veterinary Drugs and Supplies (Wormers, vaccines and etc.)										
Fuel and oil										
Housing maintenance										
Utilities (Water and Electricity)										
Land Tax										
Rentals: (land, machine, animal, tools and equipment)										
Transportation cost (inputs and farm produce)										

Table 6.7, continued. . .

6.7.1	6.7.2	6.7.3	6.7.4	6.7.5	6.7.6	6.7.7	6.7.8	6.7.9	6.7.10	6.7.11
Production Inputs that are Purchased	Annual Average Before 2010					Annual Average from Year Loaned Until 2017				
	Unit	Qty	Unit Price (PhP)	Total Cost (PhP) (to be computed)	Source/ Provider	Unit	Qty	Unit Price (PhP)	Total Cost (PhP) (to be computed)	Source/ Provider
Veterinary Services										
Other, specify: _____										
Code to Source/Provider (6.7.6/6.7.11) 1 – Bought; 2 – Given/Free; 3 – Own Produce; 4 – Borrowed/availed for a loan; 5 – Barter 96 – Other, specify _____										

6.8 Total Cost in Before 2010 (to be computed): PhP_____

6.7. Total Cost from Year Loaned Until 2017 (to be computed): PhP_____

SECTION VII. TECHNOLOGY ADOPTION, COMMUNICATION AND SUPPORT SERVICES

7.1 Technology Adoption on Recommended Natural Mating Practices Only for the same species as the loaned male breeder.

7.1.1	7.1.12	7.1.3	7.1.4	7.1.5	7.1.6	7.1.7	7.1.8	7.1.9	7.1.10	7.1.11
Practice	Year Heard	Source of Information	Year 1st Tried	Year of Adoption	Year Stopped	Year Resumed Adoption	Reason for Adoption	Reason for Non-Adoption	Level of Knowledge About the Practice	Degree of Effectiveness and Changes Observed (Impact)
Male breeder mounting and exercise										
Acquainting the male breeder with the female animal										
Follow-up mating										
Mating during colder time of the day										
Avoid female exposure to extreme temperature or stress after mating										
Pen mating; male and female spending overnight in 1 pen										

Previous table 7.1 , continued . . .

7.1.1	7.1.12	7.1.3	7.1.4	7.1.5	7.1.6	7.1.7	7.1.8	7.1.9	7.1.10	7.1.11
Practice	Year Heard	Source of Information	Year 1st Tried	Year of Adoption	Year Stopped	Year Resumed Adoption	Reason for Adoption	Reason for Non-Adoption	Level of Knowledge About the Practice	Degree of Effectiveness and Changes Observed (Impact)
Observance of breeding weight and breeding age of animals										
Observance of frequency of male breeder use										
Observance of male to female ratio										
Observance of female animals for sign of heat										

Code for Source of Information (7.1.3)	1 – DA-LGU	2 – DA-RFU VIII	3 – PCC	4 – Other farmers	96 – Other, specify
Code for Level of Knowledge (7.1.10)	1 – Low	2 – Moderate	3 – High		
Code for Effectiveness (7.1.11)	1 – Not effective	2 – Less effective	3 – Effective	4 – Very effective	

7.2 After your first try, did you continue adopting natural mating practices? _____
0 – No 1 – Yes

7.2.1. If No, why not? _____
_____
_____

7.2.2. If Yes, why? _____
_____
_____

7.3 Did you attend seminars/trainings regarding male breeder management and handling? _____ 0 – No 1 – Yes

7.3.1. If No, why not?_____
_____
_____

7.3.2. If Yes, please provide the needed information

7.3.2.1	7.3.2.2	7.3.2.3	7.3.2.4	7.3.2.5
Title of Trainings/ Seminar	Year	Venue	Sponsoring Agency	Knowledge Learned
Before transfer of male breeder animal				
( ) Male breeder animal management				
( ) Animal crossbreeding				
( ) Dairy production				
( ) Milk processing				
( ) Other, specify _____				
After the transfer of male breeder animal				
( ) Male breeder animal management				
( ) Animal crossbreeding				
( ) Dairy production				
( ) Milk processing				
( ) Other, specify _____				

7.4 What knowledge and skills have you learned from Animal Breeder Management and Handling Training (if applicable)?

7.4.1	7.4.2
	Short Description
Knowledge	
Skill	

7.5 Participation on Other Animal-Related Activities

7.5.1	7.5.2	7.5.3	7.5.4
Activity	What was your role in the activity?	Year	Sponsoring Agency
On-Farm Trials			
Techno-Demo Farm			
Field Day			
Cross Visit			
Lakbay-Aral			
Animal-related Festivals			
Other, specify _____			

Code to Role in the Activity (7.5.2)

1 – Spokesperson
2 – Coordinator
3 – Participant
4 – Observer
96 – Other, specify _____

7.6 Other Trainings and Seminars on Livestock Production (inclusive of A-PLP trainings)

7.6.1. Have you or any member of the household attended any seminar/trainings related to livestock production between 2010-2016? _____(0 – No; 1 – Yes).

If YES . . .

7.6.1.1	7.6.1.2	7.6.1.3	7.6.1.4
Title of Training	Year	Name of Organizer	Type of Training on Livestock Production
1			
2			
3			
4			

Codes to Type of Training (7.6.4)
1 – DA-LGU 2 – DA-RFU VIII 3 – PCC 96 –Other, specify

7.6.2. What are the positive impacts in attending the training? _____

_____

7.6.3. Did you receive any award or recognition in relation to _____ production (same species as the loaned breeder animal)? _____ (0 – No 1 – Yes)

7.6.3.1	7.6.3.2	7.6.3.3	7.6.3.4
Award/ Recognition	Sponsoring Agency/Organization	Year Received	Remarks

Code to Remarks (7.6.3.4)

1 – Local
2 – Regional/Provincial
3 – National
4 – International
5 - Agency

7.6.4. Did you share/pass the knowledge/information and skills learned from the trainings about Animal Breeder Management and Handling to others? _____
0 – No 1 – Yes

7.6.4.1 No, why not? _____
_____

7.6.4.2 If Yes, to whom? _____

7.6.4.2.1	7.6.4.2 .2	7.6.4.2 .3	7.6.4.2 .4
Information Shared	Number of Recipient	On what occasion	Venue/Address

7.7 Other Services Availed from DA-LGU/ DA-RFU VIII and Other Organizations

7.7.1. Have you availed of other services from DA-LGU/ DA-RFU VIII related to livestock production Before 2010? _____ 0 – No 1 – Yes

7.7.1. 2	7.7.1. 3	7.7.1. 4	7.7.1. 5	7.7.1. 6	7.7.1. 7
Type of Service	Livestock Species and Breed	No. of Animals	No. Availed per Year	Service Provider	Impact (Provide details and quantify)
Vaccination/ Drugs and biologics					
Deworming					
Vitamins/ Supplements					
Upgrading of stocks					
Artificial insemination					
Laboratory analysis					
Forage/Pasture/Planting materials					
Market linkage					

Codes for Breed (7.7.1. 3): 1 – Native 2 – Purebred 3 – Crossbred
Codes for Service Provider (7.7.1. 6): 1 – DA-LGU 2 – DA-RFU VIII 96 – Other, specify_____

7.7.2. Have you availed of other services from DA-LGU/ DA-RFU VIII related to livestock production from July 2010 to June 2016? _____ 0 – No 1 – Yes

7.7.2.1	7.7.2.2	7.7.2.3	7.7.2.4	7.7.2.5	7.7.2.6
Type of Service	Livestock Species and Breed	No. of Animals	No. Availed per Year	Service Provider	Impact (Provide details and quantify)
Vaccination/ Drugs and biologics					
Deworming					
Vitamins/ Supplements					
Upgrading of stocks					
Artificial insemination					
Laboratory analysis					
Market linkage					

Codes for Breed (7.7.2.2): 1 – Native 2 – Purebred 3 – Crossbred

Codes for Service Provider (7.7.2.5): 1 – DA-LGU 2 – DA-RFU VIII 96 – Other: specify_____

7.8 Farmer's Role and Understanding of the Program

7.8.1. What motivated you to join the Male Breeder Loan Program/ avail of loan for a male breeder?

1 – Improve genetic make-up of animals
2 – Increase productivity
3 – Increase income
4 – Reduce mortality/ morbidity
5 – Develop linkage
96 – Other, specify _____

7.8.2. Do you regularly meet with your MBLP Coordinator? _____

0 – No 1 – Yes

7.8.2.1 If Yes, how many times did you meet in a year? _____

7.8.2.2 If No, why not? _____

_____

7.8.3. What is your role as a MBLP beneficiary? _____

_____

7.8.4. Do you submit any report regarding the MBLP? _____ 0 –No 1 – Yes

7.8.4.1 If Yes, to whom? 1 – DA-LGU; 2 – DA-RFU 8; 3 – PCC; 96 – Other, specify ____

7.8.5. What report do you submit? _____
_____

7.8.6. How often do you submit? _____
1 – Monthly 2 – Quarterly 3 – Yearly 4 – Never 5 – Other, specify

7.8.7. Did you (1) read and (2) understood) the Male Breeder Loan Contract that you signed? _____

7.8.8. Who else read/ explained it to you? 1 – DA-LGU; 2 – DA-RFU 8; 96 – Other, specify __

7.8.9. In your opinion what needs to be done to increase the services of male breeder animal loaned to you?_____
_____

7.9 Did you receive IEC Materials on livestock? _____0 – No 1 – Yes

7.9.1	7.9.2	7.9.3	7.9.4	7.9.5	7.9.6
IEC Materials (Information, Education & Communication Materials)	Do you use it? 0 – No 1 – Yes	Why don't you use it?	If used, was it useful? 0 – No 1 – Yes	Why was it useful?	If not useful, Why?
Wastong pangangalaga ng mga hayop (livestock)					
Gabay sa mga serbisyo					
Mga sakit ng hayop					
Wastong pangangalaga ng					
Wastong pagpapakain					
Artificial insemination sa mga					
Pagpapahiram ng bulugang					
Other, specify _____					

SECTION VIII. FARMERS ATTITUDES TOWARDS NATURAL MATING USING PUREBRED MALE BREEDER FROM A-PLP

8.1 Rate the Technology Attributes of Natural Mating Using the Male Breeder Animal Loaned from DA-LGU/ DA-RFU 8

8.1.1	8.1.2	8.1.3
Technology Attributes of Natural Mating	Rating	Explanation/ Remarks
a) Relative Advantage		
Genetic make-up of offspring produced is improved compared to native breeds		
Genetic make-up of offspring produced is improved compared to AI		
Higher success rate of impregnation than AI		
Requires less labor in breeding than AI		

Previous table 8.1, continued . . .

8.1.1 Technology Attributes of Natural Mating	8.1.2 Rating	8.1.3 Explanation/ Remarks
b) Simplicity		
Natural mating is simpler breeding practice than AI		
Purebred breeder is easier to handle than native breeder during mating		
Can be done even without technical experts		
c) Compatibility		
Natural mating using purebred breeder is acceptable to farmers to breed their animals		
Natural mating using purebred breeder is adoptable to local condition and resources		
d) Observability		
The advantage/ benefits of natural mating are clear and observable		
The physical attributes of offspring of purebred breeders thru natural mating is observable even when they are still young		
Natural mating ascertains success of conception/ impregnation immediately		
e) Trialability/ Adaptability		
Can be done using all breeds of _____		
Can be done any time of the day when the female animal is in-heat		
Can be done even without technical experts than AI		
Code to Rating (8.1.2): 4 – strongly agree 3 – agree 2 – disagree 1 – strongly disagree		

8.2 Attributes of the Loaned Male Breeder Animal from DA-LGU/ DA-RFU 8

8.2.1 Technology Attributes	8.2.2 Rating	8.2.3 Explanation/ Remarks
Genetic make-up of offspring produced is improved		
Produces offspring that has higher milk production		
Produces offspring that is bigger		
Produces offspring that is fast growing		
Adjusts easily to agro-climatic condition		
Resistant to disease		
Feeds on locally available resources		
Can be tamed easily		
Male breeder is acceptable to neighbors to breed their female animals		
Code to Rating (8.2.2): 5 – strongly agree; 4 – agree; 3 – moderately agree; 2 – disagree; 1 – strongly disagree		

SECTION IX. ORGANIZATIONAL MEMBERSHIP

9.1 Organizational Membership

9.1.1. Have you or any member of your household been a member of any organizations? _____ 0 – No 1 – Yes

9.1.1.1	9.1.1.2	9.1.1.3	9.1.1.4
Name of Organization	Type of Organization	Year of Membership	Status of Membership
1			
2			
3			
4			
5			

Codes to Type of Organization (9.1.1.2)

1 – Agriculture related organization/ Farmer's Group
2 – Labor organization
3 – Religious organization
4 – Youth organization
5 – Women organization
7 – Political organization
8 – Cooperative
9 – Organization for seniors/ elderly
10 – Health-related organization
11 – Patrol/ peace and order
6 – Men's organization
96 – Other, specify _____

Code to Status of Membership (9.1.1.3)

1 – Adviser/Officer/Board Member
2 – Active Member
3 – Non-Active member
96 – Others, specify _____

9.1.2. Enumerate organization-related problems, if any:

9.1.2.1 _____
9.1.2.2 _____
9.1.2.3 _____

SECTION X. SUPPORT SERVICES AND ASSISSTANCE FROM GOVERNMENT AGENCIES AND NON-GOVERNMENT ORGANIZATIONS (for livestock production)

10.1 Assistance from Government Agencies

10.1.1. Did you receive cash assistance from government? _____ (0 – No; 1 – Yes)

10.1.1.1	10.1.1.2	10.1.1.3	10.1.1.4	10.1.1.5
Cash Assistance (Amount and Purpose)	Year	National	Provincial	Local
1				
2				
3				
4				

10.1.2. Did you receive noncash assistance from the government? _____
(0 – No; 1 – Yes)

10.1.2.1	10.1.2.2	10.1.2.3	10.1.2.4	10.1.2.5
Noncash Assistance (Form)	Year	National	Provincial	Local
1				
2				
3				
4				

10.2 Assistance from Non-Government Organizations

10.2.1. Are there other agencies or NGO's that provide support to livestock production? _____ (0 – No; 1 – Yes)

10.2.1.1 If yes, please provide details

10.2.1.1	10.2.1.2	10.2.1.3
Name of Agency/NGO	Year support services was provided	Kind of services provided and purpose

10.3 Other Support Services Needed to Improve Livestock Raising

10.3.1	10.3.2	10.3.3
What other support services do you need to improve livestock raising?	And what agency do you think can provide the support?	Rank (1 – 5 where 5 being highly needed)

SECTION XI: CREDIT (for production of the same livestock species as the loaned male breeder animal)

11.1. Nagungutang ka ba para gamitin sa iyong loaned male breeder? (Did you avail of credit for your loaned male breeder?) _____ (0 – No; 1 – Yes)

11.2. Saan/mula kanino ka humiram ng pera? (Where/from whom did you borrow money?)___

1 – Bank; 2 – Cooperative; 3 – Government Agencies; 96 – Other, specify

11.3. Magkano ang iyong hiniram? (How much did you borrow?) _____

11.4. Magkano ang interes at iba pang mga singil? (How much is the interest and other charges?)

11.4.1 Interest: PhP_____ 1

11.4.2 Other charges: PhP_____

11.5. Ano ang termino ng pagbabayad? (What is the repayment term?) _____

(0 – Installment; 1 – Full Payment)

11.6. Maturity of Loans (Months) _____

11.7. Enumerate credit-related problems, if any:

11.7.1 _____

11.7.2 _____

11.7.3 _____

SECTION XII. IMPACTS

12.1 Social Impacts

12.1.1 Knowledge/Skills Creation and Sharing

12.1.1.1. What knowledge did you gain from being a male breeder handler? 389. Please state knowledge learned and briefly describe.

12.1.1.1a	12.1.1.1b
Knowledge Learned	Brief Description of Knowledge Learned and Its Use

12.1.1.2. What are the skills that you developed as a result of being a male breeder animal handler? Please state skills developed and briefly describe.

12.1.1.2a	12.1.1.2b
Skills Developed	Brief Description of Skill and Its Use

12.1.1.3. Did the training/ seminar you attended help improve the management of your male breeder? _____ (0 – No; 1 – Yes)

12.1.1.4. Which of the topics discussed in the training/ seminar helped improve the management of your animal?_____

_____

12.1.1.4a Why? _____

_____

12.1.1.5. Do you think there is a need for retraining/ refresher course? _____ (0 – No; 1 – Yes)

12.1.1.5a Why? _____

_____

12.1.2 Use of Income Derived from Breeder Services and Livestock Raising

12.1.2.1	12.1.2.2	12.1.2.3
Item	Total Cost Spent	Year Acquired
Education		
Food/daily allowances		
Improvement of house		
Improvement of animal shed		
Bought appliances		
Bought farm implements		

Table 12.1.2, continued. . .

12.1.2.1	12.1.2.2	12.1.2.3
Item	Total Cost Spent	Year Acquired
Payment of hospital bills		
Purchase of motorcycle or other machineries		
Payment of mortgages _____		
Expenses of family member going abroad		
Other, specify _____		

12.1.3 What are the benefits of the Male Breeder Loan Program to you and your farm? (Encircle; multiple response accepted)

1 – Affordable/ cheap source of improved genetics

2 – Reduced incidence of inbreeding

3 – Increased source of family income

12.1.4 What are the benefits of the Male Breeder Loan Program to the community? (Encircle; multiple response accepted)

1 – Help alleviate malnutrition/ hunger

2 – Help alleviate poverty in the community

3 – Women empowerment

4 – Help solve the problem of unavailability of quality livestock

5 – Better linkages among livestock raisers in thecommunity

6 – Affordable/ cheap source of improved genetics

7 – other, specify _

12.1.5. Do you know the significance of the Male Breeder Loan program to the livestock industry? _____ (0 – No; 1 – Yes)

12.1.5.1 If Yes, what could the program contribute to the livestock industry? ___

_____

12.1.6 Are you aware if the MBLP has made any changes in the following area in the community?

12.1.6.1	12.1.6.2	12.1.6.3
Pagbabago ng pananaw tungkol sa pag-aalaga ng mga hayop		
Pagbabago ng pananaw tungkol sa gamit o silbi ng mga hayop		
Pagbabago ng pananaw tungkol sa kabutihang idudulot ng pag-aalaga ng mga hayop		
Pagbabago ng pananaw tungkol sa paano pagkakakikitaan ang mga hayop		
Pagbabago ng kita ng ibang mga magsasaka		
Pagbabago ng mga *lahi (breed)* ng mga hayop ng ibang mga magsasaka		
Stability/Marketability ng ibang hayop ng mga magsasaka		
Other, specify _____		

12.1.7 What is/ are your aspiration for yourself and your family?

12.1.8 Do you think the MBLP helped you achieve your aspirations in life? _____ ___ (0 – No; 1 – Yes)

If Yes, in what way? _____

If No, why? _____

12.2 Environmental Impacts

12.2.1 Are you aware if Male Breeder Loan program has made any contribution or changes to the improvement of the following area?

12.2.1	12.2.2	12.2.3
Category	0 – No; 1 – Yes	Description of Observed Changes
Paggamit ng crop by-products bilang pagkain sa male breeder		
Pagkakaroon ng waste pit para sa mga dumi ng kalabaw		
Pagkokompost gamit ang dumi ng hayup (kalabaw, baka, kambing at iba pa)		
Paggamit ng compost bilang pataba sa bukid (*itala ang mga crops na ginagamitan ng compost*)		
Pagbabawas ng pagsunog ng dayami sa bukid		
Conversion of agricultural lands to grasslands/pasture		
Pagdami sa mapaminsalang insekto at peste sa bukid		
Spread of disease – disease transmission to other ruminants/livestock		
Shift in livestock species/system		

12.2.2 What problems did you encounter in handling the loaned breeder animals?

12.2.2.1 Production and Management: _____

12.2.2.2 Social : _____

12.2.2.3 Political : _____

SECTION XIII. ADDITIONAL INFORMATION FOR FARMER-BENEFECIARIES OF MBLP

13.1 How did you become involved with the Male Breeder Loan Program of DA?

_____

_____

_____

13.2 From your point of view, describe the most significant change that has resulted from your availment of the male breeder animal.

_____

_____

_____

13.2.1 Why is this change significant to you?

_____

_____

_____

13.2.2 What difference has this made now or will it make in the future? ____

_____

_____

13.2.3 What are the observable evidences that can support or substantiate your "change stories"?_____

_____

_____

13.4. Would you recommend this kind of project to others?_____
(0 – No; 1 – Yes)

13.4.1 If yes, explain _____

_____

_____

13.4.2 If no, explain_____

_____

_____

13.5 How do you assess the success of the Male Breeder Loan Program of DA?

13.5.1 High, explain _____

_____

_____

13.5.2 Moderate, explain _____

_____

_____

13.5.3 Low, explain _____

_____

_____

13.6 Do you have any suggestion(s) to further improve the implementation of the Male Breeder Loan Program? _____ (0 – No; 1 – Yes)

13.6.1 If yes, explain _____

_____

_____

Thank You Very Much!!!