FINAL REPORT

Consulting Services for the Conduct of Impact Evaluation Study of Laguna de Bay Institutional Strengthening and Community Participation (LISCOP) Project in Calabarzon

SUBMITTED TO:

SUBMITTED BY:

ASPSI
ASIAN SOCIAL PROJECT SERVICES, INC.

SEPTEMBER 2018

Impact Evaluation of Laguna de Bay Institutional Strengthening and Community Participation Project (LISCOP) in CaLaBaRZon, NEDA IV-A

FINAL REPORT

September 12, 2018

ASIAN SOCIAL PROJECTS SERVICES, INC. (ASPSI)

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ACRONYMS106

AF	Additional Financing
ASPSI	Asian Social Projects Services, Incorporated
BOD	Biochemical Oxygen Demand
CENRO	City Environment and Natural Resources Office
CSR	Corporate Social Responsibility
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOT	Department of Tourism
ECA	Environmental Compliance Audit
EIRR	Economic Internal Rate of Return
EMB	Environmental Management Bureau
EUF	Environmental User Fee
EUFS	Environment User Fee System
FGD	Focus Group Discussion
GES	General Effluent Standards
HH	Household Survey
IDS	Infrastructure Development Strategy
IE	Impact Evaluation
IEC	Information, Education, and Communication Campaign
ISWMF	Integrated Solid Waste Management Facility
IWM	Integrated Water Management
KII	Key Informant Interview
LEAP	Laguna de Bay Watershed Environmental Action Planning
LGU	Local Government Unit
LIDO	Letter of Institutional Development Objective
LISCOP	Laguna De Bay Institutional Strengthening and Community Participation
LLDA	Laguna Lake Development Authority
LRC	Learning Resource Center
MAO	Municipal Agriculture Office
M&E	Monitoring and Evaluation
MENRO	Municipal Environment and Natural Resources Office
MIS	Management Information System
MRF	Material Recovery Facility
NEDA	National Economic and Development Authority
NGO	Non-Governmental Organization
NRM	Natural Resource Management
PAMB	Protected Area Management Board
PDMD	Project Development Management and Evaluation Division
PMEPP	Permitting, Monitoring, Enforcement, Policy, and Planning Procedures

PMES	Permitting, Monitoring and Enforcement System
RC	River Council
SubWaQM	Sub-Water Quality Management
TSS	Total Suspended Solids
WB	World Bank
WWTF	Waste Water Treatment Facility

1.0 EXECUTIVE SUMMARY

Every development program seeks to generate a positive impact on beneficiaries' lives. One aspect that all these programs have in common is that they are always designed with the ultimate goal of improving the quality of life of a targeted population (Lima, et al, 2015).

The Laguna De Bay Institutional Strengthening and Community Participation (LISCOP) project is one such development program aimed at improving the environmental quality of Laguna Lake and its watershed and strengthen the development of institution that will support the lake's sustained management. LISCOP project started in 2004 and lasted until April 2014.

This study entitled 'Impact Evaluation of LISCOP Project', is essentially an assessment of how the LISCOP project, (being considered in here as an intervention), being evaluated affects the outcomes, the effects of which maybe intended or unintended. More generally, this evaluation establishes whether the intervention has a welfare effect on individuals, households and communities, and whether this effect can be attributed to the concerned intervention.

The objectives of the LISCOP's impact evaluation study were to measure the environmental impacts; participation and involvement of communities and other stakeholders in watershed planning and management; environmental compliance of regulated establishments; and LLDA transformation as an apex organization for lake basin management.

Specifically, the scope of work aimed to:

- Identify and assess if there was a decrease in the negative environmental impacts;
- Assess if there was an increase in the participation and involvement of communities and other stakeholders in watershed planning and management;
- Assess if there was an improved environmental compliance of regulated establishments;
- Assess the transformation of LLDA as an apex organization for integrated lake basin management; and
- Identify other benefits and gains (both planned and unplanned) and impacts (intended and unintended) of the project to the beneficiaries.

Moreover, the study evaluated and identified lessons learned in the implementation of the program in support of decision-making in the conduct of similar program/projects in the future.

Qualitative evaluation survey was predominantly utilized to draw inferences for reviewing LISCOP project with its various sub-project implementation thru interviewing project beneficiaries to get their personal opinions, conducting focus group discussions (FGD), key informant interviews (KII), analyzing supportive secondary data, etc. Out of the 25 LGUs, 24 LGUs participated in FGDs conducted in 19 sessions. Participants in FGDs included key persons from the LGU Offices such as Planning and Development, Environment and Natural Resources, Engineering, Tourism, Administrative and Finance, among others. For the KII, the Team was able to conduct 29 KIIs from 22 LGUs which were participated by representatives from barangays such as Barangay Captains and/or Barangay Councilors. Two separate FGD sessions were also conducted for LLDA officers and staff from the different divisions such as Policy Planning and Information

Management, Project Development Management and Evaluation, Community Development, Environmental Laboratory and Research, Legal and Adjudication, Surveillance and Monitoring, Administrative and Finance. Household surveys from direct (previously involved during the planning and implementation of the LISCOP sub-projects or presently involved in the sub-project) and indirect (community) beneficiaries were conducted to assess the responses of individuals, households and community members concerning the intervention. Further, the assessment utilized a counterfactual (control group) where outcomes were also analyzed as to what would have been in the absence of such an intervention. The control group was the same as the treated/treatment group in terms of demographic, location, life stage, etc., and that it is not in any way been exposed to LISCOP program or to any of its sub-projects. A total of 300 respondents were covered in the household survey. Seventy five (75) of which were direct beneficiaries while 125 were indirect beneficiaries. The remaining 100 respondents came from the control group.

In a scale of 0 to 5 with five being the highest, more than 89% of the direct beneficiaries have indicated that LISCOP project, through its sub-projects, was able to address environmental concerns in their localities. Participation and involvement of communities and other stakeholders increased (i.e. 76% direct beneficiaries and 60% community members) in watershed planning and management activities. Target compliance by enterprises improved from 30% in year 2010 to 92% three years after when compared with the baseline.

More than half (58%) of the community members surveyed have indicated socio-economic contributions of the LISCOP sub-projects. Increase in income brought about by the direct employment of some households and other related economic and livelihood activities were experienced by the respondents. The respondents claimed that LISCOP has enhanced their social interaction and unity through their engagement in the project itself. The sub-projects were implemented safely and did not pose any danger to the community. As regards institutional and management of LISCOP project and sub-projects, the investigation indicated that Laguna Lake Development Authority (LLDA) can still able to function effectively in dispensing its mandate of management and promotion of institutional arrangements through coordination and planning at a basin level. Economically, LISCOP sub-projects generated an economic internal rate of return (EIRR) of 12%.

Lessons learned and best practices extracted from interviews, surveys and consultations included: participatory and consultations with stakeholders allowed for better understanding, have developed an attitude and practice of collectively keeping their surrounding areas clean and support of project interventions; effective institutional framework improved the effectiveness of project implementation, stakeholder cohesion, open channel of communication and exchange of information.

Based on the objectives of this impact evaluation study, the following policy recommendations are hereby endorsed:

- *For responsible municipal and barangay units:*
  - Promotion of integrated ecosystem services and adaptive management;
  - Advancing cost effectiveness and environmental benefits of waste management through composting and recycling;
  - Develop solid waste operations and incentive-based programs;

- Dedicate a staff position to serve as sustainability coordinator to work with municipal and community efforts in waste reduction and other sustainability activities;
- Develop inter-local cooperation for improved service delivery i.e. on waste management and other related environmental protection and conservation;
- Fostering good local governance, transparency and accountability;

o *For responsible DENR-LLDA units:*

- Modify municipal and barangay land use codes to require commercial developments to provide space and access for recycling and composting;
- Continue to provide capacity building activities for concerned elected LGU officials as regards improved service performance (decision-making process and iteration), risks and sensitivity analysis and project/program implementation / monitoring; and
- Consolidate / innovate a network of technology transfer support structure for target LGUs.

Overall, the study proceeded with success despite the shortcomings. Data were collected, assembled and analyzed in a transparent, rigorous fashion, and in accordance with the established framework free of any pre-determined bias to address the concerns and objectives that were intended to be addressed.

2.0 INTRODUCTION

The Laguna De Bay Institutional Strengthening and Community Participation (LISCOP) project aimed to improve the environmental quality of Laguna Lake and its watershed and strengthen the development of institution that will support the lake's sustained management. The project covered two components namely: a) the co-managed investments and watershed developments implemented by the Local Government Units (LGUs); and b) institutional strengthening of Laguna Lake Development Authority (LLDA), LGUs, river councils, and communities for sustained and effective management of the lake. The first component supported demand-driven investments (sub-projects) designed to improve the environmental quality of the watershed. The sub-project had four categories: a) waste management and sanitation; b) natural resources management; c) soil erosion and 4) localized flood prevention; and eco-tourism. The second component assisted LLDA in implementing its re-engineering program, strengthening its role as the apex body for management of the Laguna de Bay watershed; assisting LGUs, river councils, and watershed stakeholders in establishing and undertaking an environmental planning process; providing incremental operational support for efficient project management to LLDA, LGUs, and river councils; and implementing the monitoring and evaluation framework.

The project which started in 2004 and extended until 30 April 2011 had an original financing amounting to PhP649 million. The project was funded by the following institutions: a) World Bank (WB) loan; b) Netherlands grant; c) Philippine Government; and d) LGUs. An additional financing (AF) of PhP381.576 million from the WB and another three-year extension were provided for the project from 31 January 2010 until 30 April 2014.

The conduct of impact evaluation of completed projects is a monitoring and evaluation (M&E) initiative of the National Economic and Development Authority (NEDA) central and regional offices. As for the LISCOP project, where the coverage area included municipalities surrounding Laguna Lake and within Region IV-A, NEDA Region IV-A took the initiative and facilitated the conduct of this impact study. In October 2017, the Asian Social Project Services, Inc. (ASPSI) was contracted to conduct the impact evaluation study of LISCOP project.

The project entitled "Impact Evaluation of LISCOP Project," is essentially an assessment of how the LISCOP project (considered here as an intervention), affects the outcomes, the effects of which maybe intended or unintended. In other words, this project impact evaluation studied the effect of LISCOP project intervention through its sub-projects on its outcomes, rather than the project outputs of the project implementation process. More generally, this evaluation established whether the intervention had a welfare effect on individuals, households and communities, and whether this effect could be attributed to the concerned intervention.

The project utilized qualitative and quantitative methods in assessing the impact of the LISCOP project. Qualitatively, impact evaluation was done from reviewing projects implementation process through interviewing project beneficiaries to get their personal opinions and conducting focus group discussions to analyzing supportive secondary data. The evaluation also used participatory impact assessment that reflected changes using participants' personal knowledge about conditions in the project area. Quantitatively, the study used Cochran's test and ordinal regression to determine the significant differences

in the response among the groups of respondents. Three sets of respondents were interviewed to achieve the objectives of evaluation. These were the direct beneficiaries, the community, and the control group. The analysis of the control group indicated what had happened in the absence of such an intervention.

2.1. OBJECTIVES AND SCOPE OF SERVICES

The objectives of the LISCOP's impact evaluation study were to measure the environmental impacts, participation and involvement of communities and other stakeholders in watershed planning and management, environmental compliance of regulated establishments, and LLDA transformation as an apex organization for lake basin management, benefits and gains (planned and unplanned), and intended and unintended impacts to the beneficiaries.

Specifically, the scope of work aimed to:

- Identify and assess if there was a decrease in the negative environmental impacts;
- Assess if there was an increase in the participation and involvement of communities and other stakeholders in watershed planning and management;
- Assess if there was an improved environmental compliance of regulated establishments;
- Assess the transformation of LLDA as an apex organization for integrated lake basin management; and
- Identify other benefits and gains (both planned and unplanned) and impacts (intended and unintended) of the project to the beneficiaries.

Moreover, the study evaluated and identified lessons learned in the implementation of the program in support of decision-making in the conduct of similar program/projects in the future.

3.0 METHODOLOGY

3.1. The Study Area

The LISCOP project intervention defined on the ground through its sub-projects were implemented in different municipalities in four (4) provinces, namely: Cavite (i.e., Municipality of GMA); Laguna (i.e., Municipalities of Cavinti, Kalayaan, Liliw, Mabitac, Majayjay, Nagcarlan, Paete, Pakil, Pangil, Pila, Rizal, Sta. Cruz, Sta. Maria, Siniloan, and Victoria), Quezon (i.e., Municipality of Lucban); and Rizal (i.e., Municipalities of Angono, Antipolo City, Baras, Morong, Rodriguez, Tanay, Taytay and Teresa) (**Figure 1**).

3.2. The Impact Evaluation Framework

The process for undertaking this project is graphically illustrated in **Figure 2.** LISCOP project impacts were measured in terms of environmental impacts, participation and involvement of communities and other stakeholders in watershed planning and management, environmental compliance of regulated establishments, LLDA transformation as an apex organization for lake basin management, benefits and gains (planned and unplanned), and intended and unintended impacts to the beneficiaries.

A program logic or theory of change principle was adopted, which defined an assessment describing how intervention activities were understood to contribute to a chain of outcomes that produced the intended results. The principle also covered the assumptions and external factors that influenced the extent to which outputs led to intended outcomes.

Program logic helped in the identification of lessons learned which were evident in the results of the surveys and interviews with the various stakeholders as to the impacts of the program/sub-projects. In connection with the survey, it is important to gather information about the implementation activities to distinguish between implementation failures (where the program/sub-project failed because it was not properly implemented and theory failure (when the program/sub-project failed despite adequate implementation).

In the course of conducting the impact evaluation, the following were considered:

- Funding of each LISCOP sub-project implemented, including procurement and contract management costs;
- Expertise, both internal and external, contributors in project implementation;
- Related policies and local ordinances acted upon in support of the intervention;
- Time of project implementation/execution;
- Political sensitivities affecting project intervention/implementation; and
- Practices and techniques applied in project implementation.

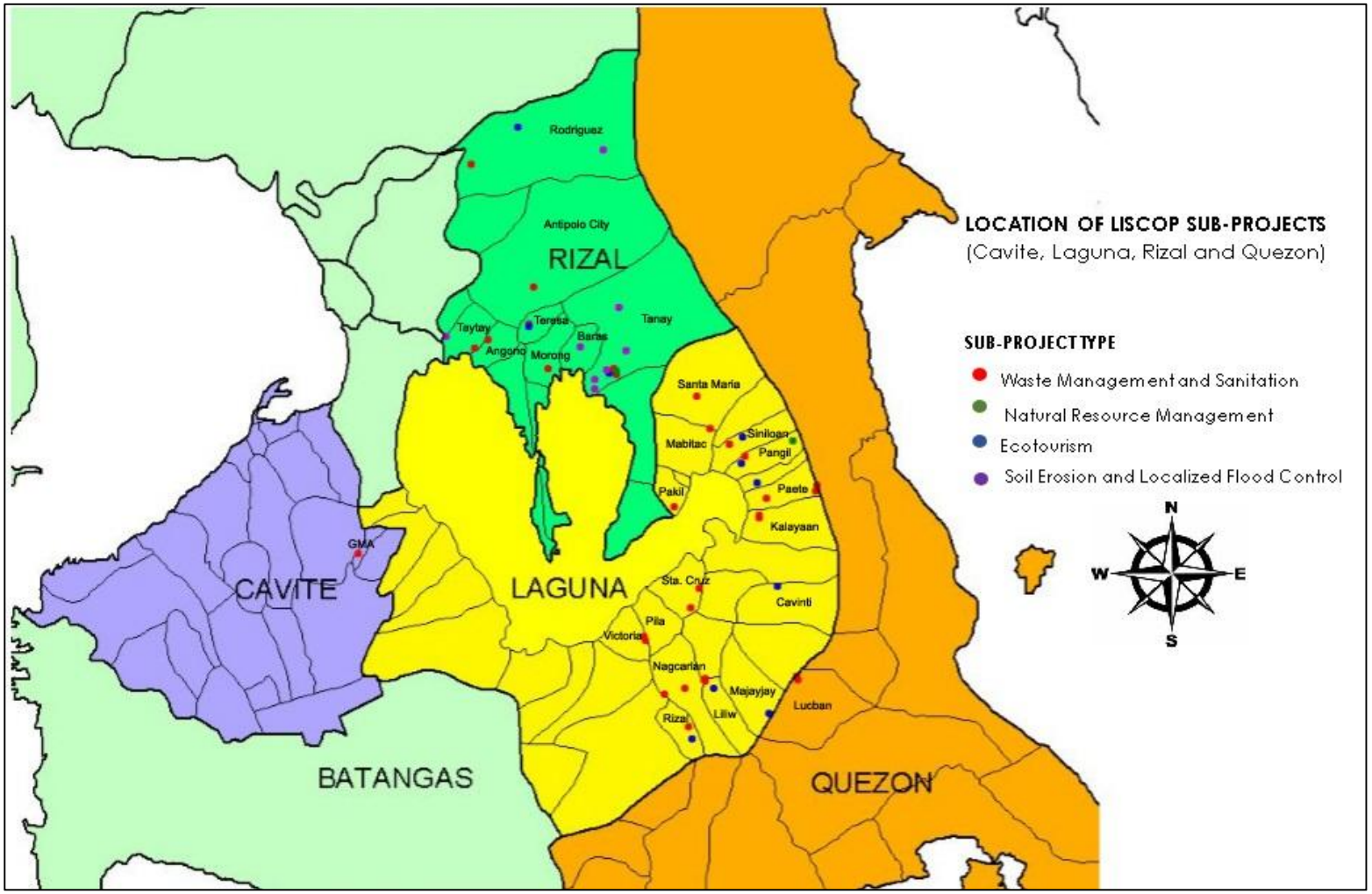


Figure 1. The location map of LISCOP sub-projects

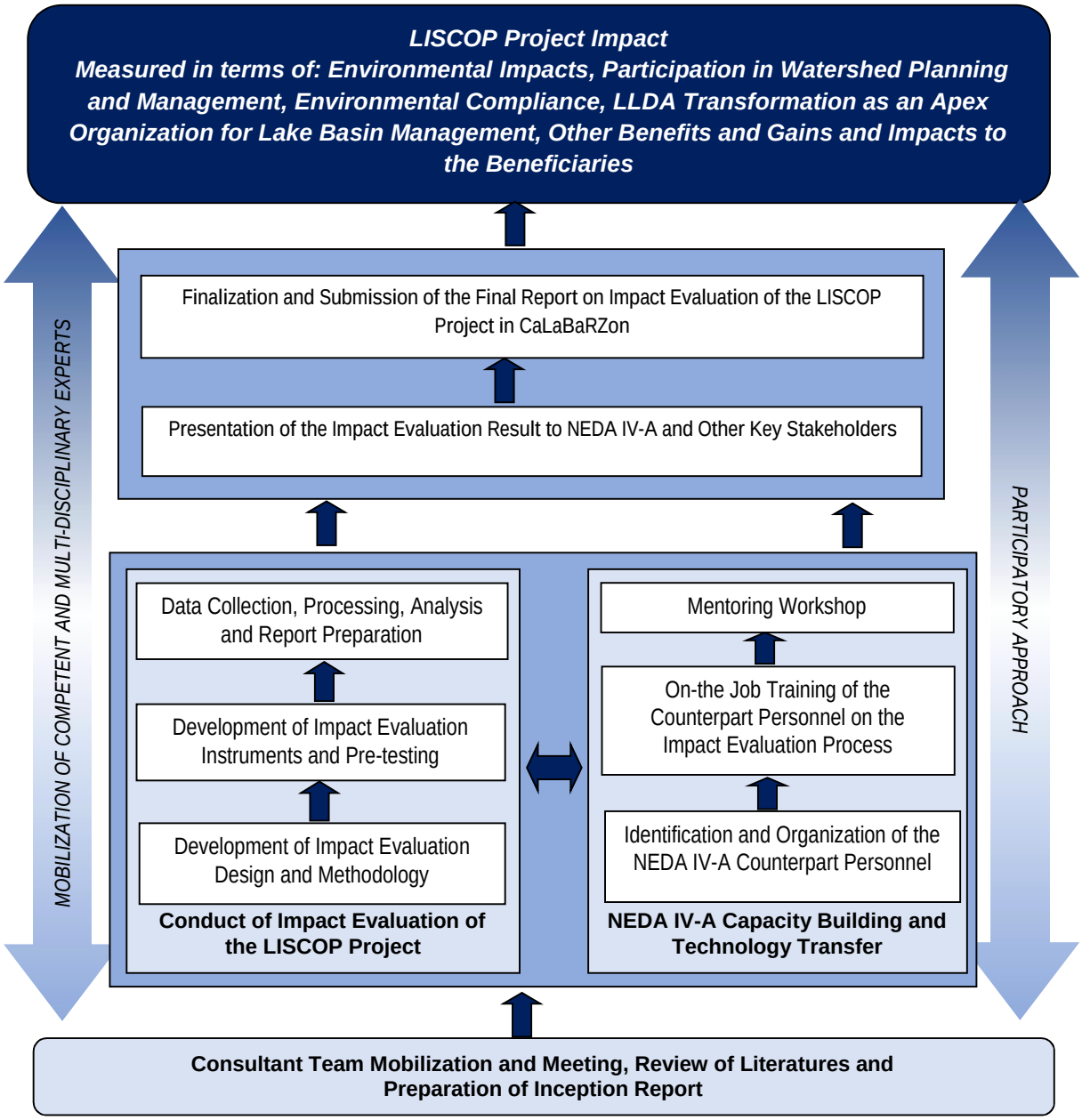


Figure 2. Process flow for the implementation of impact evaluation of LISCOP project in CaLaBaRZon

3.3. Qualitative and Quantitative Approaches

Qualitative evaluation was predominantly utilized to draw inferences for reviewing the LISCOP project with its various sub-project implementation. This was done thru interviewing project beneficiaries to get their personal opinions, conducting focus group discussions (FGDs), and analyzing supportive secondary data. The assessment then reflected whatever changes (environmental and social) there may be using participants'

personal knowledge about conditions in the project area. Further, the assessment utilized a counterfactual (control group) where outcomes were also analyzed as to what would have been in the absence of such an intervention. This was done using the Cochran's Q test using SPSS Statistics. The proportionate answers of the respondents from LISCOP study sites (beneficiary and community) and control group on the changes in their area (environmental, social) were taken as variables. When a statistically significant result was obtained, pairwise multiple comparison test between these respondent groups were conducted to determine which of the individual groups were different. The individual alpha level was adjusted using the Bonferroni method. Meanwhile, the Ordinal Logistic Regression Analysis using SPSS was used to determine whether rating outcomes of the respondents in terms of the sub-project addressing environmental issues, socio-contributions, hazard/danger risks, overall success, and impact can be attributable to the LISCOP project.

Secondary data were gathered to provide context and benchmark findings coming from the various organizations, people's organizations/cooperatives among others in relation to project implementation. Community level data were derived from key sectoral representatives in the barangays including representatives from the local government units, business sector, women, and youth to complement the analysis.

The survey instrument was structured to facilitate and examine closely changes or improvement of the beneficiaries brought about by the project/sub-project intervention. The conduct of FGDs complemented the results of the household (HH) survey and the Key Informant Interviews (KIIs) to gather participants/respondents' views and opinions in relation to the stated intervention. The FGD participants were key stakeholders and LLDA officials and staff who have direct/indirect knowledge/experience of the LISCOP project. The KII generated specific information from selected barangay official knowledgeable about the project, specifically on the implementation of their respective sub-project(s) in their locality. Household survey from direct and indirect (community) beneficiaries was conducted to assess the responses of individuals, households, and community members concerning the intervention.

3.4. Economic Analysis

Economic measurement of impacts of selected LISCOP sub-projects was based on computing and approximating the beneficiaries' situation with the project to control situations where there is no action or without the project itself. Over a period of five years (2014-2018), provisional services (i.e., incremental benefits) were quantified and valued based on data records provided for in the original feasibility studies available. In most cases where vital records were missing, alternative values were provided taken from areas or sub-project sites approximating similar site or ecosystem characteristics. This technique is called *better transfer method*, where the ecosystem to which values are transferred is termed the "policy site" and the ecosystem from which the value estimate is borrowed is termed the "study site." An example was the completed Material Recovery Facility (MRF) sub-project, which specifically defined equipment and building as the accomplishments in Mabitac, Nagcarlan, Siniloan, Antipolo, and Tanay to balance computation of productivity in terms of benefit. The analyst conducted cross-referencing and cross matching of records to establish parameters needed to calculate benefits.

In other environmental/ecosystem service(s) where a particular ecosystem service(s) requires valuation, values were assigned approximating the prevailing market indicators as per analyst choice. This method is called *revealed preference method*. This method assigns a particular market value of the analyst choice, on a typical ecosystem service that is subject to valuation. For instance, sub-project like ecotourism where a number of visitors

were recorded but no values were taken to measure benefit or income. Using a scheme called *hedonic pricing method*, a value is assigned to an ecosystem service which can either raise or lower the base price of a particular non-market environmental benefit generated by using a particular ecosystem or environmental good.

4.0 SCOPE AND LIMITATIONS

In terms of stakeholder's perception. The scope and limitation of this impact evaluation study may differ depending on the nature of the evaluation survey results (e.g., FGD, KII and HH). The resulting responses that respondents provided, as well as the choices that were made about the aspects being assessed in relation to a particular sub-project of LISCOP project may differ depending on the kind of involvement and the position they occupied during the sub-project's implementation. In particular, impact evaluation was not only about assessing the effects of the intervention (sub-project introduction) but also about underlying questions of what types of processes of change and effects were valued as important (positive or negative) by the respondents themselves. Furthermore, the reliability of information based on stakeholder perceptions would vary depending on their strategic responses (e.g., least resistance, cautious or dynamic), manipulation of information (e.g., truthful and correct without omission) or the kind of advocacy they believed in.

Impact of what. Many if not all of the sub-projects of LISCOP addressed aspects that are assumed to be critical for effective development yet difficult to define and measure, such as human security, good governance, political will and capacity, sustainability, and effective institutional systems. Hence, this impact evaluation study adopted queries to approximately capture these concerns through a survey instrument for the HH survey and sets of guide questions for the KII and FGD depending on the nature of the sub-project, stakeholder involvement, site of interventions (project location and area coverage), and target group.

Impact on what: Institutional level versus beneficiary level. It is useful to distinguish between two principal levels of impact: impact at the institutional level and impact at the beneficiary level. It includes a full range of impacts at all levels of the result chain, including ripple effects on families, households, and communities; on institutional, technical, or social systems; and on the environment. Project implementation and execution can be labeled as institutional primarily aim at changing second-order conditions (i.e., capacities, willingness, and organizational structures enabling institutions to design, manage and implement better policies for communities, households and individuals). Examples are policy dialogues, policy networks, training programs, institutional reforms, and strategic support to institutional actors (i.e., governmental, civil society institutions, private contractors, and hybrid), and public-private partnerships.

Importance of accurate and reliable data. Results of meetings, interviews and consultations with concerned stakeholders (e.g., officials and people assigned and/or involved in the LISCOP project thru the implementation of their respective sub-project(s) and sub-project beneficiaries) served as the primary data of this evaluation. It is impossible to have a discussion among them based on mutually understood and accepted data at present due to the absence of needed information. Collection and gathering of secondary data oftentimes were incomplete and lacking in details. Essentially, this condition led to the principle of truism that what gets measured gets valued, and that what is not, or cannot be measured were ignored.

Despite these weaknesses, data were collected, processed and analyzed in a transparent, rigorous fashion, in accordance with the established sampling procedure free of any pre-determined bias to address the concerns that were intended to be addressed.

5.0 RESULTS AND DISCUSSION

5.1. Identify and assess if there was a decrease in the negative environmental impacts

The environmental impacts of LISCOP were assessed by finding out the perceptions of the survey respondents, key informants and the FGD participants on contributions of the specific sub-projects in addressing the environmental issues and problems of their respective communities. On a scale of 1-5 with 5 being the highest, the respondents were asked to rate the overall environmental contributions of the LISCOP sub-projects based on their observations and experiences. The survey respondents included the direct beneficiaries (e.g., laborers, operators, and collectors), community members, and those outside the LISCOP study sites (as control respondents). **Table 1** shows that LISCOP was able to address the environmental problems of the communities as mentioned by most of the respondents (89% and 74% of the direct beneficiaries and community members, respectively). Most of the respondents from the non-LISCOP communities (96%) also expressed that similar projects addressed the environmental problems in their areas.

Based on Cochran's Q-test (see **Annex 1**), these values were determined to be significantly higher than the proportion of respondents who perceived that the sub-projects did not address environmental issues ($x^2(2) = 5.261$, $p<0.005$). This means that in LISCOP sub-project areas and control, significant percentage of the respondents opined that the sub-project addressed environmental issues and problems in their area. Specifically, the primary environmental problem that was addressed is ***waste disposal*** as articulated by most of the direct beneficiaries (64%), community members (68%), and the control respondents (61%). This problem was addressed by the establishment of MRF sub-project, which promoted waste segregation and regular garbage collection. Some (14% beneficiaries; 6% community members; 14% control group) respondents also noted LISCOP's contributions in addressing the problem on ***deforestation***. This was made possible through the establishment of natural resources management projects such as agroforestry, reforestation, and eco-park projects; which component activities included tree planting and IEC and advocacy campaigns. The problem on water and air pollution was also addressed by the LISCOP sub-projects as highlighted by some respondents (13% beneficiaries, 8% community members, and 16% control group. This could be attributed to the proper waste disposal as well as the reforestation activities. Meanwhile, the problem on flooding, soil erosion, and landslides in flood-prone areas had been addressed by the flood control projects which called for the rehabilitation and construction of riprap of drainage canals, and clean-up activities.

It can be noted further in **Table 1** that the responses from the control group are comparable to the direct beneficiaries and communities of LISCOP. Pair-wise comparison of respondents from LISCOP project sites and control did not indicate any difference in the proportion of respondents who perceived that the sub-projects implemented in their areas addressed environmental issues ($x^2(2)=2.273$, $p<0.132$) (based on Bonferroni p-value). The non-LISCOP communities may have similar sub-projects particularly the MRF in their community primarily in compliance with the Republic Act 9003 otherwise known as Philippine Ecological Solid Waste Management Act of 2000. Section 10 of RA 9003 states that "the local government units shall be primarily responsible for the implementation and enforcement of the provisions of this Act within their respective jurisdictions". Thus, even LGUs without LISCOP could have implemented projects and activities to help address environmental issues in their respective communities. In addition, the control group represented Sariaya, Quezon and San Pablo City, Laguna, both of which are situated within Mount Banahaw, where public and private sector efforts have been undertaken as

part of their environmental advocacy. The LGU in Sariaya, Quezon has also installed a Municipal Environment and Natural Resources Office (MENRO) to look into the environmental concerns of the municipality.

Table 1. Environmental contributions of LISCOP sub-projects as perceived by the direct and indirect project beneficiaries, LISCOP: 2017 (in percent)

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiaries (n=75)	Community (n=125)	
Addressed environmental issues and problems			
Yes	89.33	74.40	96.00
No	10.67	24.80	4.00
No idea/answer	0.00	0.80	0.00
Total	**100.00**	**100.00**	**100.00**
Environmental issues addressed			
Waste disposal	63.75	68.00	61.40
Water/air pollution	12.50	6.00	15.79
Deforestation	13.75	6.00	14.04
Slash-and-burn	2.50	0.00	3.51
Others			
a) Flooding/overflowing of water	5.00	10.00	1.75
b) Use of chemical fertilizers	1.25		
c) Insufficient sanitation facilities (i.e. comfort rooms)	1.25		
d) Soil erosion and landslides		5.00	3.51
e) Aesthetics		1.00	
f) Security issues		2.00	
Total	**100.00**	**100.00**	**100.00**
Rating on the environmental contributions of LISCOP sub-projects			
1 (Very low)	2.67	10.40	3.00
2 (Low)	1.33	7.20	5.00
3 (Moderate)	37.33	29.68	25.00
4 (High)	26.67	26.40	27.00
5 (Very high)	25.33	17.60	40.00
No answer	6.67	8.00	0.00
Total	**100.00**	**100.00**	**100.00**

These findings were validated by the results of FGD and KII. For instance, results of the FGD stressed that the LISCOP sub-projects have improved the drainage system through the flood control project; improved riverbank stabilization, watershed vegetation and environmental protection through the reforestation and eco-park projects; and improved solid and liquid waste management through the MRF projects. In addition, the MRF created community awareness about proper solid waste management. The MRF by-products, particularly the biodegradables were grounded and dumped into the forestlands which served as organic fertilizers. The reforestation and eco-park projects helped in greening the urban communities to showcase the tourism potentials of the municipalities.

KII results also supported the findings discussed above. For instance, 10 out of 12 key informants emphasized that the MRF project has addressed the environmental problems of their communities' particularly solid waste management. Among the significant changes observed were: a) decreased burning of wastes; b) proper disposal of animal wastes; c) waste segregation; and d) decreased volume of wastes. This is specifically true for Antipolo where the 300 tons per day of garbage were dumped in the MRF before the implementation of LISCOP. Currently, only 60 tons per day are transported to the MRF.

For agroforestry, reforestation and eco-park projects, among the observed environmental contributions were: a) reduced soil erosion in watershed areas in Tanay, Rizal; b) preserved the aesthetic value of the watershed; and c) controlled illegal activities such as charcoal making. Meanwhile, the local flood control and riverbank stabilization projects have minimized flooding because of the construction of riprap. Therefore, the extent of damage to lives and properties, including agricultural production, has also decreased.

The box below highlights the specific contributions of each of the LISCOP sub-projects as noted by the key informants.

Case 1. Materials Recovery Facility

Ten (10) out of the 12 respondents mentioned that the MRF project has addressed the environmental problems of their communities particularly on solid waste management. Among the significant changes observed were: decreased burning of wastes; proper disposal of animal wastes; waste segregation; and decreased volume of wastes. When asked about the rating of the environmental contribution of MRF on a scale of 1-5 with 5 being the highest, four (4) respondents gave a rating of 4 because there were still other community members who did not comply with proper solid waste management, while three (3) gave a rating of 5.

Case 2. Agroforestry, Reforestation and Eco-Parks

In general, the LISCOP sub-projects were able to address the environmental problems in the two communities. Reduced soil erosion was observed in the watershed areas in Tanay, Rizal. In addition, the aesthetic value of the watershed has been preserved, which created potential for tourism. On the other hand, agroforestry project has addressed the problem on illegal activities such as charcoal making. In this regard, the two (2) key informants rated the environmental contributions of LISCOP at 3.5 and 4 because there is still room for improvement in the project implementation.

Case 3. Ecotourism

All five (5) key informants recognized the environmental contributions of ecotourism sub-projects in their respective communities. For instance, the Eco Park has been serving as a relevant tourist destination in Liliw, Laguna. The ecotourism sub-project also created and raised awareness among the community members on the importance of the environment; promoted proper solid waste management; and preserved the natural resources. As such, one key informant gave a rating of 5 in terms of the current and future environmental contributions of their eco project; two (2) key informants gave a rating of 4; one gave a rating of 3; and one key informant gave a rating of 2.

Case 4. Soil Erosion and Local Flood Control Project

The two key informants recognized the contributions of the LISCOP sub-projects in addressing the environmental problems of their communities. For instance, the construction of riprap was a big help to the community as flooding was significantly lessened, and thus, the extent of damage to lives and properties due to flooding also decreased. As such, the key informant from Barangay Tandang Kutyo gave a rating 5 to the environmental contributions of LISCOP project in their community. Meanwhile, the key informant from the other community, mentioned that through the drainage system project, flooding, destruction of properties including farms had been reduced. This particular LISCOP sub-project was given a rating of 3, as there are still a lot of developments and improvements to make.

From the key informants of Angono, Rizal, after LISCOP, only residuals are now dumped in the MRF because the 10 barangays segregate wastes. Moreover, the number of trucks transporting the wastes was reduced from six (6) to three (3) trucks a day because of the segregation at the barangay level. This also meant reduction in the amount of money spent to transport these wastes. For its economic contribution, the LGU employs seven (2) senior staff who are paid PhP7000 per month and five (5) staff paid at PhP4,000 per month. Albeit the products are not being sold, the LGU produces organic fertilizer from coconut husks from the market and hollow blocks. For instance, in March 2017, a total of 17 sacks of organic fertilizers were distributed to interested households. At PhP120 per sack, the production for March could have amounted to PhP2,040. Similarly, hollow blocks produced in the MRF were used for the local government unit's project and distributed free for toilet construction. Inasmuch as the research team would like to estimate the total contribution of the production of organic fertilizer and hollow blocks, it was not possible because the municipality did not have a complete inventory of their production.

As evidenced by the LGU's compliance to the Ecological Solid Waste Management Act, the Department of Interior and Local Government (DILG) implements the Environmental Compliance Audit. The Environmental Compliance Audit (ECA) aims to: 1) assess the compliance of local government units to basic environmental laws particularly, RA No. 9003 or the Ecological Solid Waste Management Act of 2000; 2) ensure that environmental issues and concerns are brought to the attention of local and national leaders; and 3) see to it that public officers that are tasked to implement environmental laws actually do their duties and sustain its implementation. Furthermore, the ECA serves as the assessment tool of the Seal of Environmental Protection (SEP). For an LGU to be conferred with the Seal, it has to fare relevantly high at five (5) key legal provisions of R.A. No. 9003: 1) mandatory segregation of wastes at source (Section 21); 2) no segregation/No collection rule (Section 48, par. 4 & 8); 3) functional Materials Recovery Facility or MRF (Section 42); and 4) disposal facility (Sections 36 to 42) 5. No littering mandate of law (Section 48, par. 1) (DILG 2017).

Several LGUS were recipients of Environmental Compliance Audit Awards. Topping the list is Teresa, Rizal as Hall of Famer. These awardees are as follows:

Table 2. List of municipalities with ECA awards by category, 2016

ECA Award Category	Local Government Unit
Hall of Famer	Teresa, Rizal
Platinum	Kalayaan, Laguna
Gold	Antipolo City, Rizal
	Sta. Cruz, Laguna
	Tanay, Rizal
Silver	Angono, Rizal
Bronze	Cavinti, Laguna
	Baras, Rizal

Source: DILG Region IV-A

On the other hand, the municipalities with approved solid waste management plan as of 2016 are as follows:

Table 3. LGUS with Approved Solid Waste Management Plan, 2016

Province	Municipality/City
Laguna	Cavinti
	Kalayaan
	Liliw
	Majayjay
	Mabitac
	Nagcarlan
	Paete
	Pakil
	Pangil
	Sta. Cruz
	Rizal
	Siniloan
	Victoria
Rizal	Angono
	Antipolo City
	Baras
	Morong
	Rodriguez
	Tanay
	Teresa

Source DILG Region IV 2016 Annual Report

5.2. Assess if there is an increase in the participation and involvement of communities and other stakeholders in watershed planning and management

The involvement and participation of the communities in the planning and implementation of LISCOP sub-projects were assessed by determining the respondents' awareness about the sub-project and their direct participation and engagement in the project activities. The survey results were validated by the FGD and KIIs which were administered to the selected individuals directly involved in the planning and implementation of LISCOP sub-projects.

It should be noted that when the control groups were asked, their participation was with reference to projects similar to the sub-projects of LISCOP such as MRF, agroforestry projects, and environment-related projects.

Table 4 shows that most of the respondents (76% beneficiary; 60% community) were aware about the LISCOP sub-projects. Of which, 80% represented the respondents of soil erosion and local flood control project; 73% MRF respondents; 48% respondents of ecotourism sub-project, and 42% from agroforestry, reforestation, and eco-park sub-projects. Various forms of consultations were done by the LGU to keep the community members informed about the project. Of these, LGU-initiated meetings and seminars were the primary form of consultation as cited by most of the respondents (54% beneficiaries; 52% community members). The survey respondents from the project sites also noted that most of them (79% beneficiaries; 46% community members) were informed about the livelihood opportunities of the different LISCOP sub-projects. These opportunities were highlighted during the LGU-initiated meetings and public announcements. For these outcomes, Cochran's Q test indicates that there was significant difference in the proportion of respondents who said that there was community awareness about LISCOP sub-projects ($x^2(2) = 8.222$, $p<0.016$), and that they were informed about livelihood opportunities provided by LISCOP ($x^2(2) = 30.863$, $p<0.000$) (see **Annex 2**).

Furthermore, 71% of the respondents from the control area were aware regarding the sub-projects (non-LISCOP) in their communities. This awareness level, however, was significantly different (i.e., lower percentage) compared to that of the LISCOP project site (direct beneficiary) ($x^2(2) =6.250$, $p<0.016$). There was also significantly higher percentage of LISCOP direct beneficiaries that were informed about the livelihood opportunities provided by the sub-projects implemented in their area ($x^2(2) =21.564$, $p<0.000$).
The awareness of the community about the LISCOP sub-projects could have facilitated the adoption of the project concepts. **Table 4** also highlights that most of the respondents across groups (83% beneficiary; 52% community members; 79% of the control groups) have reportedly changed their previous practices to those being espoused by the LISCOP sub-projects. For instance, 42% of MRF respondents adopted waste segregation in their respective households and communities to comply with the policies and ordinances in their communities. The same is true for 33% of the respondents of soil erosion and local flood control sub-projects, and 20% respondents of ecotourism sub-projects.

As expected, the beneficiaries of LISCOP sub-projects were more informed of the livelihood opportunities. Nearly 80% of the beneficiaries were informed of the livelihood opportunities compared to about 50% of the community and control group. Moreover, the role of the LGU was more prominent for both beneficiaries and the community with LISCOP sub-projects than the control group in informing the people through meetings and public announcements by the LGUs on the livelihood opportunities.

Worth noting also is the percentage of the respondents regardless by type who adopted waste segregation. The next form of adoption, which is a very distant second is the appreciation on the value of environment protection. Waste segregation is understandably high because of the money, albeit small, that people derive from selling recyclable materials. A point of intervention should be enhancing the appreciation of the value to protect the environment because all the other interventions will be more easily accepted and eventually adopted.

The awareness and level of community participation in the control sites is comparable to that of the LISCOP project sites. It should be noted that the major sub-project by type in both LISCOP and control areas involved waste management and sanitation (i.e., construction and operation of MRF. The construction and operation of MRF is mandated to all local government units under RA 9003 otherwise known as Philippine Ecological Solid Waste Management Act of 2000 and the Department of Environment and Natural Resources (DENR) Administrative Order No. 2001-34. Hence, LGUs and communities even in the non-LISCOP areas are highly receptive and fully cooperative in the implementation of this sub-project. In general, participation of the community members is influenced by their level of awareness. The LGUs in the non-LISCOP communities may have also been very active in their information and education campaign to get the active involvement of the local communities to ensure a higher level of compliance.

Table 4. Community participation in the implementation of different sub-projects by type of respondent, LISCOP: 2017 (in percent)

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
Community awareness about LISCOP Projects			
Aware	76.00	60.00	71.00
Not aware	18.67	34.40	29.00
No idea/no answer	5.33	5.60	
Total	**100.00**	**100.00**	**100.00**
Forms of consultation			
LGU-initiated seminars and meetings	54.39	52.00	47.89
Public announcement	24.56	29.33	23.94
House-to-house campaigns	8.77	12.00	19.72
Others			
a) Through the associations	3.51	1.33	1.33
b) Public hearings	1.75	4.00	2.82
c) From other people	5.26	1.33	
d) Tour on the sub-project sites	1.75		
e) Previous involvement of other household members			4.23
Total	**100.00**	**100.00**	**100.00**
Informed about the livelihood opportunities			
Informed	78.67	45.60	48
Not informed	21.33	54.40	52
Total	**100.00**	**100.00**	**100**
Form of information dissemination			
Through meetings and public announcements made by LGUs	50.85	50.88	43.75
By word-of-mouth	38.98	45.61	50.00
Through trainings and seminars attended	5.10	3.51	6.25
Through the organizations and associations	5.10	0.00	0.00
Total	**100.00**	**100.00**	**100.00**
Communities' actual engagement and participation			
Adopted the LISCOP concepts	82.67	52.00	79.00
Did not adopt	17.33	47.20	20.00
No idea	0	0.80	1.00
Total	**100.00**	**100.00**	**100.00**
Forms of adoption			
Waste segregation	82.26	86.15	81.01
Waste recycling	1.61	3.08	3.80
Appreciation on the value of environmental protection	9.67	7.69	15.19
Taking the environment into consideration during project planning	4.84	0.00	0.00
No answer	1.61	3.08	0.00
Total	**100.00**	**100.00**	**100.00**

These finding were validated by the KIIs. Eleven (11) out of 15 key informants emphasized that the LGU implementers of LISCOP consulted both men and women in the community when they were still planning for the said projects. The consultations were done through barangay general assemblies and public hearings. They were likewise informed about the livelihood and employment opportunities of the LISCOP sub-projects. For instance, in Nagcarlan, Laguna, there were 10 members from the community who were employed at

the municipalities' MRF in a job order category, and likewise, in Antipolo City. On the other hand, a key informant from Tanay, Rizal also learned that all of the labor/manpower of the construction of the flood control sub-project (particularly riprap) in Barangay Tandang Kutyo came from the community.

The box below presents the cases of community participation and involvement in the different LISCOP sub-projects as highlighted by the key informants.

Case 1. Materials Recovery Facility

Nine (9) out of 12 respondents emphasized that the LGU implementers of MRF consulted both men and women in the community when they were still planning for the said LISCOP project. The consultation was done through barangay general assemblies and public hearings. All of the community members were also given an opportunity to participate in the implementation of MRF in their respective communities. The community members were likewise informed about the livelihood and employment opportunities of LISCOP project. For instance, in Nagcarlan, Laguna, 10 members from the community were employed at the municipality's MRF in a job order category, and likewise in Antipolo City.

Case 2. Agroforestry, Reforestation and Eco-Parks

The key informants mentioned that the community members (both men and women) were consulted by the LGU implementers when planning for the LISCOP sub-projects. The consultation was done through community meetings. Likewise, all of the community members were given an opportunity to participate in the project implementation. They were given seeds and fertilizers for backyard gardening, and provided with manpower support from the barangay, whenever necessary. The community meetings and consultations organized by the LGU implementers served as venues to inform the community members about the livelihood and employment opportunities of the agroforestry and reforestation sub-projects.

Case 3. Ecotourism

Except for one, the rest of the key informants stressed that the LGU implementers consulted both men and women of the community when planning for the LISCOP sub-project. The consultation was made through public hearing. The involvement in the implementation of ecotourism projects in the five (5) municipalities was inclusive, such that, all of the community members were given the opportunity to participate in various forms. There were some community members, particularly those from the low-income group, who were getting income in the maintenance of the eco-parks. In addition, a number of community household sold their farm produce such as fruits and vegetables or cooked and served snacks to tourists as their additional source of income. This was practiced in the municipality of Rizal, Laguna.

Case 4. Soil Erosion and Local Flood Control

The key informant from the community engaged in the improvement of the drainage system was not aware whether the LGU implementers consulted the community members when planning for the LISCOP project. This was because at that time, he was assigned in a different area of work. He was not also aware whether all community members were given an opportunity to participate in the implementation of LISCOP sub-project. However, he was aware that all of the community members were informed about the livelihood or employment opportunities of this particular LISCOP sub-project because some of the community members were involved as laborers in the project implementation. Most of the community members did not have a direct source of income, and hence, their involvement as laborers provided them an opportunity to earn income. In Barangay Tandang Kutyo, on the other hand, the key informant highlighted that the LGU implementers consulted the concerned community members, particularly those whose properties were affected or traversed by the construction of riprap. The consultation was done through a meeting. Through word of mouth, the key informant learned that the community members were informed about the livelihood or employment opportunities of the LISCOP sub-project in their area. He also learned that 100% of the labor/manpower for the construction of riprap came from the community. This engagement enabled the low-income households to earn income.

Participation in the planning and implementation of sub-projects were reported for all the study sites. However, LISCOP implementation has led to organizations of waste pickers and other groups which used to be competing with each other. Evidence of these are the "ecoboys" of Nagcarlan and association of waste pickers and accreditation of junk shops in Antipolo.

5.3. Assess improvement in the environmental compliance of regulated establishments

This objective of the assessment was accomplished by analyzing the performance indicators measuring the regulatory/instrument strengthening component of LISCOP. The indicators were: a) development of an Environment User Fee System (EUFS) based on Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD); b) increase in the compliance of enterprises; c) modified Environmental User Fee (EUF) formula officially adopted; d) EUF parameters expanded; e) number of establishments covered by EUF increased by 300-400; f) 16-25% increase in revenue from EUF system; g) public disclosure of industry and LGU performance; 7) operational guidelines to expansion of EUF to new enterprises and their collection adopted; and h) operational guidelines for EUF expansion to households and regulation of water use developed.

Table 5 shows that the BOD was reduced by 16% in 2010 and further reduced by 29% in April 2013. Similarly, the target to increase compliance by enterprises by 30% in June 2010 and almost three years after, the number of those enterprises which complied, rose to 1,239 or 92% when compared with the baseline. Continuous increase was noted, as 2,670 applications for Discharge Permit from industries around Laguna de Bay were filed at LLDA in 2017. It should be noted that a WB study showed that only 11% of the pollution in the Laguna Lake came from the industries. Thus, the contribution to improve the water quality of the increasing number of compliant industries was limited.

The EUFS is a market-based instrument that encourages companies to invest and operate pollution prevention and/or abatement systems within their establishments. This applies the "Polluters Pay Principle" where the environmental user fee is paid for pollution discharged into the tributary rivers within the Laguna de Bay region consisting of a fixed fee and a variable fee. Later in the implementation of LISCOP, TSS was added during the implementation of LISCOP. With the adoption of Administrative Order DAO 2016-08, there were industries that were classified into sectors. Each sector has identified significant parameters. The additional parameters for water quality and general effluent standards were: Ammonia, Barium, Benzene, Benzo(a)pyrene, Boron, Ethylbenzene, Fluoride, Iron, Manganese, Nickel, Selenium, Sulfate, Toluene, Trichloroethylene, Xylenes, and Zinc; changes in the method of expression for Color, Copper, Cyanide, Nitrate, Organophosphate, Phenol & Phenolic Substances, and Polychlorinated Biphenyls (PCBs). Further, a major change was in the requirements was the monitoring of significant effluent quality parameters (SEQP) based on the establishment's industry classification, as opposed to adopting general standards applicable to all industries (Innogy 2018).

Table 5. Indicators related to improved environmental compliance of regulated establishments at baseline, target at the end of the project, and accomplishments

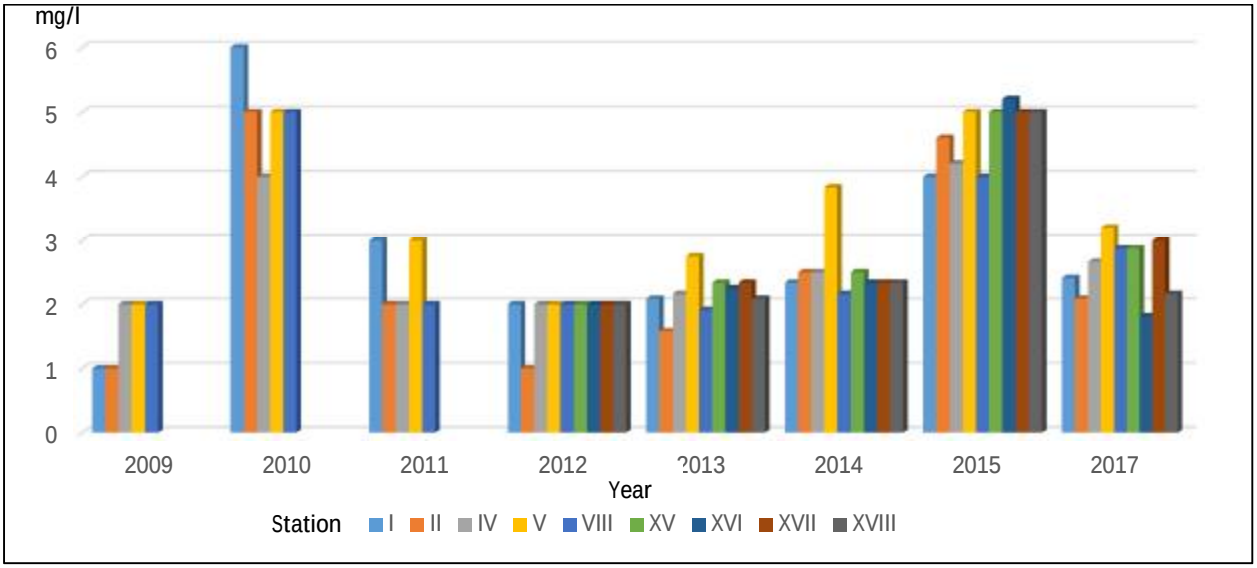
Indicator	Base-line (2003)	Original End of Project Target (July 31, 2010)	Accomplishments		
			June 2010	April 2013 2013	2014-2018
At least 10% reduction in pollution loading for regulated parameters (BOD loading in MT)	827.56	744.80	16% (698.37)	29% (587.57)	3,366 industries with 95.46% BOD loading reduction from 1997-2014
At least 30% increase in compliance by enterprises	507	659	30% (659)	91.52% (1239)	No updated data available
Modified EUF formula officially adopted	None	Modified EUF Formula adopted	Modified EUF Formula adopted		
EUF parameters expanded	1	3 (BOD, TSS, TSS/BOD)	3 (BOD, TSS, TSS/BOD		Based on DAO 2016-08, LLDA is now monitoring additional parameters depending on the industry category.
Number of establishments covered by EUF increased by 300-400	1000	1400	2427 (73.35%)	3321 (137.21%)	In 2017, LLDA received a total of 2,670 Discharge Permit (DP) applications from industries within the Laguna de Bay Region.
16-25% increase in revenue from EUF system (P million)	55	68.75% (68.75M)	126% (124.70M)	137% (130M)	PhP 197.654M generated from the implementation of EUFs in 2017
Public disclosure of industry and LGU performance occurs at least twice	0	2	3	Industry: 6 LGU: 4	The last public disclosure for industries was conducted in 2013.
Operational guidelines to expansion of EUF to new enterprises and their collection adopted	0	3	3	Adopted	
Operational guidelines for EUF expansion to households and regulation of water use developed	None	Operational guidelines for EUF expansion to households and regulation of water use developed	Operational guidelines for EUF expansion to households and regulation of water use developed		Not implemented as reported in the LISCOP Project Completion Report

Source: LLDA 2010, 2013, 2014, 2015, 2017 and 2018

Aside from the additional parameters, the expansion of EUF meant expanding the coverage to include households tested in Lucban, Quezon. However, this did not materialized due to social acceptability and lack of land to establish the water treatment facility. Effort from the LLDA to include the households was dropped. The project relied on the services provided by Maynilad, National Water Resources Board (NWRB) and other concessionaires. As of 2014, the total EUF collection amounted to PhP67.170M or 117% of the projected annual revenue of PhP57.295 M (LLDA, 2014). For 2017, the revenue generated from the implementation of EUFs was PhP187.45M.

In line with the commitment to the implementation of EUFS, LLDA issued Memorandum Circular No. 2017-05 adopting the DAO No. 2016-08 of DENR to serve as guide in the implementation of the new General Effluent Standards (GES) for the continuous implementation of the EUFS in the Laguna Bay.

BOD is the amount of oxygen required by microorganisms for stabilizing biologically decomposable organic matter (carbonaceous) in water under aerobic conditions. The test is used to determine the pollution load of wastewater, the degree of pollution and the efficiency of wastewater treatment methods (LIMGIS 2001). Data from LLDA show that the DENR class C water quality criterion for BOD set at 7 mg/L was complied in all of the nine monitored lake stations from 2009 to 2017[1] based on the computed annual average BOD concentrations (**Figure 3**). Noticeably, the BOD level at Station V (Northern West Bay), the collecting station closest to the Lake's only outlet, Napindan Channel is connected to Manila Bay via the Pasig River. Whenever the lake level is lower than Manila Bay, the Pasig River reverses its flow during the entry of saltwater due to the effect of tidal fluctuation in Manila Bay, the salinity of the water in the lake increases. This happens in the lake not every year but occasionally in summer months (LLDA, 2013). This situation also explained the high BOD level in all nine stations in 2015 plus the effect of the El Niño.



Source: LLDA 2010, 2013, 2014, 2015

Figure 3. Biochemical Oxygen Demand by station, 2009-2017

[1]DENR Class C water quality criterion for BOD set at 7 mg/L based on DENR Administrative Order (DAO) No.34

5.4. Assess the transformation of LLDA as an apex organization for integrated lake basin management

LLDA was created through RA No. 4850 (as amended by Presidential Decree 813). It is a government agency that leads, promotes, and accelerates sustainable development in the Laguna de Bay region. In addition, regulatory and law-enforcement functions are carried out with provisions on environmental management, particularly on water quality monitoring, conservation of natural resources, and community-based natural resource management.

Preceding studies indicated LLDA as the only authority with an exclusive mandate that is focused on water resources and emphasized the importance of strengthening its organizational structure and staffing, technical and financial capabilities to ensure that the problems of pollution and environmental deterioration are effectively addressed in the midst of intensified rapid industrialization and urbanization, population growth, and subsequent economic and related activities in the lake watershed.

Table 6 shows the different outcome indicators related to strengthening of LLDA under LISCOP. All indicators had been accomplished earlier than the targeted date except for the establishments of the river councils and the corresponding increase in its level of maturity. In 2018, LLDA reported that 30 River Councils have been recently reorganized; hence, the targeted level of maturity has not been achieved.

As a background and from the LLDA Rationalization Plan 2010, Environmental Regulatory Refinement was created with three (3) divisions, namely: clearance and priority, surveillance and monitoring, and enforcement. The following were some of the outcomes of the rationalization plan: a) improvement in structure in terms of having one permitting procedure for all machinery; b) improvement as compliance to the International Organization for Standardization (ISO) and Governance Compliance for a Government Owned and Controlled Corporation (GOCC) commitments; c) established the foundation of the Permitting, Monitoring and Enforcement System (PMES) which is one major indicator in LISCOP; d) there is a PMES for LISCOP but not implemented due to linkages and computerization of the system; e) there was no problem in the number of permits issued but only in the processing time; f) there was an initiative to start online application but there were problems in internet connection and changed in the location of LLDA so they cannot interconnect the developed systems; and g) there were instruments adopted to improve the PMES e.g., citizen's charter (i.e., number of days the permits should be processed). Further implementation of the RatPlan resulted to the conversion of driver positions to technical positions; hence, transportation servicers were outsourced. Other changes were that the Finance Division handles the assessment functions but not reflected in their structure and there were no staff identified to handle the function (**Table 4**).

The consciousness to improve the status started during the LISCOP years although one could not really guarantee that it was only through LISCOP. The major contribution of LISCOP was the establishment of the building, now housing all the offices of LLDA, which used to be separately located. The former office in Calauan and the water-testing laboratory in Taytay, Rizal are now housed in the National Ecology Center, East Avenue Quezon City.

The other indicators which had been accomplished ahead of schedule were: 1) LLDA implemented the new structure and completed its re-engineering program as envisioned in the Letter of Institutional Development Objective (LIDO); 2) data management systems improved; 3) Management Information System (MIS) benchmarking completed; 3)

measures to upgrade Permitting, Monitoring, Enforcement, Policy, and Planning Procedures (PMEPP) officially adopted in LLDA; 4) Infrastructure Development Strategy (IDS) adopted by LLDA; and 5) monitoring and evaluation framework set up and in use. It should be mentioned that the monitoring and evaluation was subsumed as one of the functions under the Project Development Management and Evaluation Division (PDMD). The other indicator which had been surpassed the target was the conduct of the annual conference, seven instead of five as targeted. Moreover, several consultative forum and summit in 2017, the objective of which is similar to the conduct of conferences, that is, reaching out to the stakeholders and soliciting their ideas on LLDA programs, projects and policy Meanwhile, the publication, Laguna de Bay Environmental Monitor was published seven times instead of the targeted five issues. In 2018, as indicated in **Table 4**, LLDA will still continue the publication of the monitor. In fact, the team in charge of its publication is in the process of coordinating with the contributors for the collection of relevant materials and data/information.

As of the target date, LLDA only completed one River Council (RC) office instead of the targeted 10 (RCs). The average level of maturity of the sole RC established rose to 3.51%. Eventually, this indicator was dropped based on the LLDA completion report. Eventually, the 30 river councils, six (6) RCs more than the target set by LISCOP, have been reorganized complete with new set of officers last December 2017. This happened because some LGUs belonging to cluster councils opted to organize their own river council. An example is the Alaminos, Calauan, San Pablo cluster. Albeit belonging to one watershed, the LGUs decided to set up their own council because of separate bodies of water to conserve, protect, and manage. The organization of the river councils gave rise to environmental activities like river/lake clean up and planting of trees. For example, the revived Taytay River Council organized clean-up activities since 2016. In March 2017, aside from the cleanup of Maningning Creek and Bangaid Creek, Taytay through the river council established eco garden for schools where fertilizer compost was distributed from the Municipal Agriculture Office (MAO).

The latest Pubic Perception Survey was conducted in 2016, the final report of which was accepted by the LLDA. The results of the survey showed an overall performance rating of “Very Good” based on four drivers of satisfaction: 1) Delivery and Quality of Services; 2) Staff Attitude and Professionalism;3) Transparency to Stakeholders and Office Operations; and 4) Environment Guidelines. The next survey will be conducted this 2018 for the 2017 Client Satisfaction Survey.

One output of LISCOP was the establishment of a Learning Resource Center in their Calauan headquarter. This is planned to be the venue for capacity building activities of LLDA to be managed by the Federation of River Councils. As such, the river councils will generate resources for its own operations. As mentioned earlier, one explanation for the demise of river councils was the lack of resources for its operations. Unfortunately, the whole building was heavily damaged when Typhoon Glenda hit the province in 2014. To date, there was no information of any plan to renovate the building.

Table 6. Outcome indicators, LLDA institutional strengthening, baseline, target by 2010 and accomplishments

Indicator	Baseline (2003)	Original End of Project Target (July 31, 2010)	Accomplishment		
			June 2010	April 2013	2018
LLDA implemented the new structure and completed its re-engineering program as envisioned in the LIDO	None	New structure implemented	Internal structuring completed while LLDA awaiting approval of the Rat Plan by DBM	New structure implemented based on Approved Rationalization Plan	Outcome of the Rat Plan implementation: • Driver positions converted to technical positions, hence, transport services were outsourced. • Assessment functions given to Finance Division but not indicated in the structure. Moreover, there are no staff identified to handle the function. • There is no dedicated unit or division to handle management information system of LLDA. This is just a function under Policy Planning and Information Management Division
Data management systems improved	None	Data Management System completed	100% completed		Improvement and automation of the systems are still under the LLDA Information Systems Strategic Plan (ISSP).
MIS benchmarking completed	None	Completed	Completed		The LLDA complies with DICT in the development and implementation of ISSP for the management of information systems for hardware and software requirements of the Authority.
Measures to upgrade permitting monitoring enforcement, policy, and planning procedures (PMEPP) officially adopted in LLDA	None	PMEPP officially adopted	PPMEPP has been adopted		The process is still being adopted like the Alternative Dispute Resolution under Legal and Adjudication Division, permitting and enforcement follows the LLDA Citizen's Charter.
Infrastructure development strategy (IDS) adopted by LLDA	None	IDS adopted	IDS per LLDA Board Resolution No.386		
Number of River Council (RCs) offices established	0	10	1		A total of 30 organized River Councils in Laguna de Bay Region: 18 in Laguna, 11 in Rizal and 1 in NCR.
Capacity of 24 RCs substantially expanded at least three levels		Average maturity index scores of 24	Not attained		The LLDA is in the stage of re-organizing the River Councils, since it has already been dropped as recommended by the World Bank during the LISCOP implementation under Component 2

Indicator	Baseline (2003)	Original End of Project Target (July 31, 2010)	Accomplishment		
			June 2010	April 2013	2018
		RCs moved up by 3 to 7.59			
Monitoring and evaluation framework set up and in use	None	M&E framework in place			To date, the M&E Framework was suspended towards its improvement under the LLDA ISSP
Laguna de Bay Environmental Monitor published annually	0	5	4	6	A total of six (6) environmental monitors have been published already. The latest publication was the LDB monitor 2013-2014 and released in 2015. The LLDA is still and will continue to publish the monitor.
Annual conference/learning forum conducted	0	5	5	7	In 2017, several consultative forum and summit, were conducted for the stakeholders of LLDA.
Public perception survey on effectiveness of IEC programs conducted at least twice by end of project	0	2	1st survey conducted in 2005 2nd survey conducted in 2009	3rd survey conducted (April 2013)	The last Perception Survey was conducted in 2016.

Source: LLDA 2010, 2013, 2014, 2015, 2018

The LLDA website features the issues of Laguna de Bay Environmental Monitor. The latest version, Year 2014, can be accessed at the LDDA website. Similarly, the latest Public Disclosure Program reported in the LLDA website was in 2013 when Isuzu Philippines, Inc. Biñan was awarded a Bronze Medal (LLDA 2014).

Other Considerations

The LLDA articulated specific policies and programs on Laguna Lake management and protection for more than three decades. The agency plays a vital role in several arenas where concerns for environmental sustainability have created and promoted the concept of integrated water management system (IWM). IWM is aimed at reconciling the provision of water and the demand for it, as well as competing demands themselves, to make water use economically productive, socially equitable and environmentally sustainable. In addition, the consequences of decision-making and management are readily felt by both public and private sectors, depending on Laguna Lake's water. This increases the chances for LLDA's transparency and accountability, being the apex organization for integrated Laguna Lake basin management.

- *Initiating and supporting basin management*

  Consultations with LLDA through FGD and KII of key personnel and officers in charge, of LISCOP project, clearly demonstrated its interest in basin management initiatives for water management. As mentioned in many instances, numerous programs have been initiated and supported by the agency to develop basin management. Among these programs is the LISCOP project where the concept of SubWaQMa or Sub-Water Quality Management system had been pioneered and utilized.

- *Management functions and institutional design components*

  Looking at LLDA organizational structure clearly indicated that the agency performs a set of management functions, and that the institutional arrangement has a number of design components (characteristics) and design principles. The functions commonly encompass coordination and planning at basin level, and project (infrastructure) implementation. Essentially, these functions help in the promotion of IWM in the management and protection of Laguna Lake.

Among others, the results of FGD and KII with key officials and staff of LLDA in charge of LISCOP project indicate that LLDA is indeed an apex organization for Lake Basin management, to wit:

- The agency has a clear goal of nurturing the development of sustainable management provider. Responses showed that developing sustainable management and protection strategies of Laguna Lake was the most effective way to expand the number of stakeholders served;
- LLDA is politically independent, with a strong board to protect the institution from political intervention, thus ensuring that management can make decisions on technical grounds;
- LLDA receives funding from international donors and fund agencies on a number of Laguna Lake basin programs and projects. An example is LISCOP project where funding was provided by a number of foreign and government entities as well as World Bank. This reflected the agency's capacity to handle fiscal management,

monitor and evaluate programs and projects according to institutional performance targets contained in their business plans.

- LLDA management is of high quality, possessing a blend of lake basin expertise, managerial and financial skills, and integrity;
- Lastly, looking at its plans, policies and programs, LLDA promotes a mission of building partnership and networks with agencies and individuals who are willing to participate in the protection and management of Laguna Lake.

5.5. Benefits and gains (planned and unplanned), and impacts (intended and unintended) of the LISCOP sub-projects to the beneficiaries

The positive and negative changes are commonly produced by the implementation of LISCOP sub-projects, directly or indirectly, intended or unintended. This involves the main impacts and effects resulting from the activity on the local social, economic, environmental and other development indicators. The examination of the project team did not only focus on both the intended and unintended results but also included the positive and negative impacts of external factors such as climate change and disaster risks.

Part of the evaluation questions indicated in the survey instruments clearly included unintended impacts:

- What has happened as a result of the sub-project implementation?
- What real difference has the activity made to the beneficiaries?
- How many people have been affected?
- How well did the sub-project meet the identified needs?
- How well did the sub-project meet the expected outcomes?
- What were the unexpected outcomes?

5.5.1. Planned Benefits and Gains, and Intended Impacts

Decrease in the negative environmental impacts

What could go wrong with a project that incentivized citizens about recycling work such as MRF? What could go wrong with a project that enabled many poor people to participate in diverting useful material from going to the landfill while helping them to make ends meet? Most of the respondents indicated enormous intangible benefits from the sub-projects under water management and sanitation category cluster (i.e., MRF, wastewater management facility) in its contribution to healthy living of their community and surroundings. While it was difficult to separate specific effect of proper waste and wastewater management from the overall effect of project intervention, examination of the survey results indicated that improved waste and wastewater management reduced associated diseases. Other respondents felt that good sanitation practices including safety, comfort, cleanliness, and respect, which somehow have maintained good social stratification and integrity within their respective community. Improved health benefits leading to better economic benefit (i.e., sustained income and livelihood opportunities) would eventually redound to the attainment of environmental sustainability in this regard.

Promoting natural resources management (i.e., agroforestry and reforestation projects) in which people and natural landscapes interact sustainably and efficiently was how this type of intervention was introduced to the concerned communities. Respondents supported the idea of how the sub-project could bring better biodiversity conservation and sustainability of livelihoods like agriculture, fisheries, forestry, and tourism. People were made to

become aware and to serve as stewards of these resources in order to ensure its health and sustainably productive.

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The promotion of ecotourism in concerned municipalities had positive impacts on the environment and the local economy. In fact, ecotourism has become one of the main justifications for the preservation of the natural ecosystem in the affected localities, which now included parks, recreational sites, and picnic areas. The emphasis on natural preservation for the sake of ecotourism helped stem widespread deforestation in the surrounding areas. While the full economic activities have yet to be ascertained, indications as to the positive impact of ecotourism accounted for the community's satisfaction and were highly-supportive of this development endeavor.

Increase in the participation and involvement of communities and other stakeholders

One strong benefit and impact of project intervention as shown in the survey was community cohesion. People who were affected, directly and indirectly benefitting from the project implementation, have developed an attitude and practice of collectively keeping their surrounding areas clean. The community's effort of improving their sanitation has developed a bond and a sense of belonging to the members of the community. It made them share a common pride of cleanliness, which brought about a change in social attitude.

On natural resources management projects, results of the survey have shown that people supported agroforestry and reforestation projects in the community realizing that undertaking such activities would improve productivity and increase yields, and significantly reduce emissions – providing additional food and incomes. People realized that supporting these natural resources management projects would create more jobs and would eventually expand the local carbon sink.

In relation to ecotourism, it is evident from the results of the survey that local leaders have embraced this project and have worked diligently to promote this segment of their local economy.

Lastly, on flood control projects it is also apparent from the survey results that people were convinced that this type of project helped prevent or reduced the destruction of flood waters. It included facilities such as detention facilities, coordinated operations of the reservoirs with flood control reservations, improvement of flood channels, and levees. All of these facilities helped reduce the impact of flooding and therefore decrease economic and geographic risks that were associated with no flood control.

Improved environmental compliance of regulated establishments

For establishments surrounding Laguna Lake, it is now widely recognized that the nature, extent, and impacts of environmental violations went well-beyond environmental impacts itself, but also undermined the local economies and livelihoods, good governance, and the rule of law. Operators of these establishments realized that ensuring an effective environmental compliance and enforcement regime benefits the concerned local communities by securing a healthier and safer environment for themselves and their children. It benefitted individuals, firms, and others in the regulated community by ensuring a level playing field governed by clear rules applied in a fair and consistent manner. Hence, concerned communities benefitted by creating a predictable investment climate thereby promoting economic development for themselves and for the affected establishments as well.

Institutional strengthening

The accomplishment of the LISCOP project thru the completion of its sub-projects in concerned municipalities have indicated that corresponding regulations, including technical procedures and guidelines on environmental safeguards and pollution abatement were provided for by the national agency (LLDA) and in coordination with concerned LGUs (local ordinances). Data, records, and interviews (personal opinions of technical officers and staff thru FGD and KII) have shown that regulations developed including technical guidelines and enabling conditions for effective implementation were substantially provided for by LLDA and its pool of technical experts. Additionally, its capacity to undertake environmental impact assessment (EIA) review, monitoring, and compliance were built to ensure interagency coordination on environmental management.

5.5.2. Additional Discussions and Analysis

The proceeding discussion extends the project team's concepts to understand community adaption and likely social outcomes. These concepts include social capital, which refers to the interconnections between people, and the networks they draw on for collective action; the livelihoods framework which focuses on human, natural, financial and social capital, or assets, to help understand the ability of members of the community to respond to shock and longer term changes through the development of strategies that enhance sustainable livelihoods and positive community outcomes; and resilience, which refers to the ability of individuals, families and communities to "bounce back" from disruptive events and adapt to change over time.

Social capital. This concept is based on the idea that trust facilitates cooperation and civic engagement, for mutual benefit. With the presence of sufficient trust-based engagement, 'healthy' communities have the conditions that allow the development of yet more trust, civil engagement, cooperation, and mutual benefit. Hence, one can see that social capital rich communities have in place mechanisms that had better enable appropriate responses to planned and adverse events than those that are not rich in social capital. Appropriate responses here could range from mutual assistance within the impacted community to being better able to articulate needs and utilize external (as well as internal) resources.

There is no simple measure of social capital in municipalities with successful sub-projects but the project team found employment in social service sectors which is one proxy measure of the level of social capital in the community. There are a number of other accepted measures such as stability in the resident population and hours of voluntary work by age and sex. Fundamental to all of this is the beliefs by 'locals' that they should be involved in their own destiny. So whether this is a collective action in response to a project or part of disaster recovery, we can argue the importance of the local community being a core part of the process of change.

Livelihood. Livelihood is another key aspect of the ability of people to adapt to change because of the introduction of a particular sub-project in their area of locality. Assisting in analysis of livelihoods, the livelihoods framework focuses on human, natural, financial, physical, and social capital or assets to help understand the ability of communities to respond to shocks and longer-term changes through institutional development of strategies that enhance livelihood outcomes.

Livelihoods typically lead to a focus on the nature of employment, both at the level of employment (which drives the community) and at the level of employment diversity (to support multiple livelihood opportunities and enhance adaptability. It can be seen from the FGD, KII, and HH survey that those workers and associated families were provided

capacity building trainings and orientations to ensure social outcomes sought to be achieved.

This favorable response and attitudinal perception by communities on sub-project implementation in their community is manifested in the results of surveys particularly those municipalities with completed sub-projects relative to their livelihoods.

Resilience. In this sense, resilience is the ability of the community to adapt over time. In the face of disruptions, people and communities mobilize their resources and draw available and known services, network, and systems of social support. Resilience is now being used widely as a concept that refers to the ability of communities to adapt to change.

5.5.3. Other Specific Benefits, Gains (Planned), and Intended Impacts

While the LISCOP sub-projects were designed primarily to address the environmental issues and problems of the concerned municipalities and communities, these projects have likewise provided social and economic contributions to the participating communities as discussed below.

a) ***Socioeconomic Contributions***

The socioeconomic contributions of the LISCOP sub-projects were measured by asking whether the sub-projects have addressed their socioeconomic problems such as health, income, education, and livelihood; and whether the project has spurred other economic activities within the households. **Table 7** shows that most of the respondents (89% of the direct beneficiaries; 58% of the community members; 89% of the control group) perceived the economic contributions of the LISCOP sub-projects.

Table 7. Economic contributions of the sub-projects by type of respondent, LISCOP: 2017 (in percent)

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
Socioeconomic contributions of LISCOP sub-projects			
Yes	89.33	58.40	89.00
No	9.33	32.80	9.00
No answer/No idea	1.33	8.80	2.00
Total	**100.00**	**100.00**	**100.00**
Specific economic contributions			
Improved health conditions	27.71	57.50	60.36
Increased income	49.40	33.75	28.83
Enhanced education	12.05	3.75	2.70
Provided livelihood activities	8.43	0.00	6.31
Others			
a) Skills acquisition	1.21	0.00	0.00
b) Food production	1.21	0.00	1.80
Total	**100.00**	**100.00**	**100.00**
Specific cases of improved socioeconomic contributions			
Acquired income for household expenses	43.28	16.44	14.61
Cleaner environment brought about by better waste disposal	11.94	32.88	47.19

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
Direct employment in the sub-projects	11.94	9.59	3.37
Recyclable wastes/garbage sold for additional income	2.99	2.74	0.00
Lesser incidence of HH member getting sick from burning, pollution, air-borne diseases	10.45	9.59	14.61
Practice of organic farming contributed to better health	1.49	0.00	3.37
Additional employment (recycling, junkshop and operation)	13.43	10.96	13.48
Flooding, erosion)	1.49	9.59	0.00
Help others to raise awareness such as conduct trainings, etc.	1.49	1.37	1.12
No idea	1.49	6.85	2.25
Total	**100.00**	**100.00**	**100.00**
Reasons for the lack of socioeconomic contributions			
Sub-projects did not adequately address HH problems	28.57	39.02	11.11
No observed improvement in the community	0.00	19.51	22.22
Other livelihood and economic activities in the community could not be attributed to LISCOP	0.00	2.44	0.00
The sub-project is not operational	0.00	0.76	33.33
Only HH directly employed and not the whole community	57.14	0.00	33.33
Minimal contributions to family income	14.29	29.27	33.33
Total	**100.00**	**100.00**	**100.00**
Sub-project spurred other economic activities of the households			
Yes	58.67	32.80	42.00
No	38.67	60.00	57.00
No idea/No answer	2.67	7.20	1.00
Total	**100.00**	**100.00**	**100.00**
Other economic activities that spurred			
Establishment of sari-sari store	18.18	24.39	7.14
Purchaser of livestock and working animals	9.09	2.44	0.00
New businesses (such as junkshop)	9.09	2.44	7.14
Purchased vehicles/motor bike for public conveyance	11.36	0.00	0.00
New income-generating activities such as pillow making, brick making, charcoal making)	18.18	12.20	0.00
New factory established	2.27	2.44	0.00
Additional source of income (selling of recyclable wastes like bottles and plastics)	31.82	53.66	85.71
No answer	0.00	2.44	0.00
Total	**100.00**	**100.00**	**100.00**
Rating on the economic contributions of sub-projects to the households			
1 (Very low)	2.67	16.00	3.00
2 (Low)	9.33	7.20	3.00

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
3 (Moderate)	37.33	32.88	27.00
4 (High)	28.00	20.80	29.00
5 (Very high)	21.33	10.40	33.00
No answer	1.33	12.72	5.00
Total	**100.00**	**100.00**	**100.00**

The proportion of respondents who perceived that the implemented sub-projects resulted to economic contributions in their area was statistically higher, regardless of the type of respondent as indicated by the Cochran's Q test ($x^2(2)= 30.178$, $p<0.000$) (see **Annex 3**). Paired comparison of respondents between LISCOP study area and control, however, did not show significant difference from those who perceived that the sub-project had economic contributions ($x^2(2) = 0.250$, $p<0.617$) and spurred other livelihood activities within the households ($x^2(2) = 3.60$, $p<0.000$) (see **Annexes 4** and **5**).

The economic contribution of LISCOP sub-projects was seen in terms of the increase in income as claimed by most of the respondents (49% beneficiaries; 34% community members; 29% control group). Increase in income was brought about by the direct employment of some households to the sub-projects and additional income generated from selling recycled wastes and garbage. In addition, more than half (59%) of the direct beneficiaries stressed that the LISCOP sub-projects have spurred other economic and livelihood activities, such as selling of recyclable wastes as noted by 32% of the direct beneficiaries; 54% of the community members; and 86% of the control respondents; and establishment of *sari-sari* store (18% direct beneficiaries; 24% community members; 7% control group).

Meanwhile, more than half (57%) of the community members, 28% of the direct beneficiaries, and 60% of the control group noted improved health condition in their communities. According to them, the incidence of getting sick from burning, pollution and air-borne diseases declined. This could be attributed to proper waste disposal among the households and the communities.

Only few (9% direct beneficiaries; 9% control group) respondents did not recognize the socioeconomic contributions of LISCOP sub-projects. More than half (57%) of the direct beneficiaries and 33% of the control group mentioned that only selected households benefitted from the sub-projects and not the entire community. In addition, some of the respondents (29% of the direct beneficiaries; 39% community members; and 11% of the control group) noted that the sub-projects did not adequately address the household problems.

Most of the respondents (37% direct beneficiaries; 33% community members; 27% control group) gave a rating of 3 to LISCOP sub-projects in terms of their socioeconomic contributions to the communities.

Both LISCOP and non-LISCOP communities (control group) recognized the socioeconomic contributions of the LISCOP sub-projects probably because the latter has similar projects such as MRF as discussed earlier. It may be noted that both the LISCOP community and the control group stressed improved health conditions as the primary socioeconomic contribution of the sub-projects. This is because proper solid waste management, which is being addressed by the MRF projects, generally improved the health conditions of the community members, whether in the LISCOP or non-LISCOP

communities. However, increase in income was more prominent in the direct beneficiaries of LISCOP as compared to the control group. This is because the LISCOP projects offer more employment opportunities to the local communities as garbage collectors, machine operators, and laborers of the ecotourism and soil erosion and flood control projects. Since capacity building was one of the activities embedded in the LISCOP sub-projects, the direct beneficiaries could have also been trained on the potential livelihood activities that would be generated from the sub-projects, such as recycling of wastes in MRF, and as tour guides in the case of ecotourism.

The above results were validated by FGDs and KIIs. The FGD and KII participants highlighted that the LISCOP sub-projects created employment to the local communities as some of the community members served as garbage collectors, MRF operators and laborers, laborers in the establishment of nurseries and plantation, as well as in the construction of flood control projects, and as tourist guides in the ecotourism projects. These sub-projects have likewise spurred other economic and livelihood activities to the community members because of the income generated from their employment. The additional income that they earned from their employment served as capital or start-up funds of their small businesses such as sari-sari stores, and food outlets. On a broader scale, the LISCOP sub-projects were seen as opportunities that would boost the economic development of the concerned municipalities. For instance, MRF served as an income-generating activity of the municipality, while the ecotourism projects contributed to the enhancement of the tourism industry of the municipalities.

The box below provides the specific cases highlighting the economic contributions of the LISCOP sub-projects to the different participating municipalities.

Case 1. Materials Recovery Facility

Nine (9) out of 12 key informants stressed that the LISCOP-MRF was able to address the socioeconomic problems in their communities by engaging the community members, particularly those from the low-income bracket to get engaged with the MRF operations as laborers and garbage collectors. The garbage collectors were able to send their children to school, and/or start operating food cart stores as their additional livelihood, from the income that they get as laborers. Likewise, the community members got extra income from selling the accumulated recyclable materials. The MRF has also created awareness among the community members about proper solid waste management, and as such, occurrence of diseases has declined, and the health condition has improved.

Case 2. Agroforestry and Reforestation Projects

In Tanay, Rizal, some of the community members were employed as laborers during the nursery and plantation establishment phase. Currently, there are also community members who serve as tour guides on rotating scheme at a rate of P500/group of tourists. Similarly, the agroforestry project in Pangil, Laguna employed about 175 community members for planting and maintenance of the agroforestry sites. These projects have also spurred other economic or livelihood opportunities to the community members. For instance, in Tanay, Rizal, those who were employed as laborers and tour guides were able to save as capital and start-up funds for the establishment of sari-sari stores. In Pangil, Laguna, on the other hand, some community members were engaged in abaca weaving as additional source of income.

Case 3. Soil Erosion and Flood Control Projects

In Tanay Rizal, the construction of riprap has protected the farms and properties which served as the sources of income and livelihood of the community members in Barangay Tandang Kutyo. On the other hand, the drainage system and flood control facility in another community have protected the rice fields which served as the main source of livelihood of the community members, and, ensured the security and safety of the farm production for households' sustenance. While these sub-projects did not spur other economic activities in the community, the indirect contributions mentioned above provided bases for giving a rating of 5 to the project implementation.

Case 4. Ecotourism Projects

While the ecotourism sub-project in Liliw, Laguna did not employ anybody from the community, the observed general increase in the number of tourists offered potential contributions in the socioeconomic improvement of the municipality. This sub-project has also spurred other economic and livelihood activities such as the establishment of restaurants and "pasalubong" stores. Meanwhile, the sub-project in Barangay Natividad has created employment for the community members; thus, the key informant gave a rating of 3 because there might be some additional activities that could enhance further the socioeconomic improvement in the area. It is estimated that the ecotorourism project will generate PhP2000 per month. Similarly, some community members were employed by the Municipal LGU as contractual in the ecotourism project in Tibatib Falls in Cavinti, Laguna, hence, a rating of 5. A significant contribution of the ecotourism project in Majayjay, Laguna was the establishment of livelihood activities in the community. For instance, 44 families rent out tents to tourists at a rate of P250-P350/day depending on the size. Their ecotourism sub-projects have also spurred other alternative livelihoods such as the establishment of sari-sari stores and accommodation facilities for tourists. As such, the key informant gave a rating of 4 as this sub-project needs further improvement. In Rizal, Laguna, however, the key informant could not distinguish any socioeconomic contributions of the sub-project to the community.

b) Contributions to the Overall Human Being

The contributions of the LISCOP sub-projects to the overall human being were measured in terms of three indicators. These were: a) social interaction and bonding; b) conflicts within the community brought about by the projects; and c) security and health risks.

Table 8 shows that most of the direct beneficiaries (80%) and majority (65%) of the control group claimed that LISCOP sub-projects enhanced their social interaction with other household and community members. The unity of the community members and household members in complying with the policies, particularly in waste segregation was the best strategy in enhancing social interaction as perceived by most of the community respondents (68%) and control group (60%). Meanwhile, the day-to-day interaction of the laborers engaged in the sub-projects served as venues for their communication, interaction, and bonding. However, an almost equal number of community respondents expressed that the sub-projects did and did not enhance community interaction.

Table 8. Contributions of the sub-projects to the overall human well-being by type of respondent, LISCOP: 2017 (in percent)

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
Enhancement of social interaction of the community through the LISCOP sub-projects			
Yes	80.00	49.60	65.00
No	18.67	42.40	31.00
No idea/No answer	1.33	8.00	4.00
Total	**100.00**	**100.00**	**100.00**
Strategies that have enhanced social interaction			
Attendance to meeting	3.33	1.59	3.08
Day-to-day interactions with co-employees	25.00	9.52	1.54
Interaction with visitors and tourists from adjoining communities	23.33	0.00	16.92
Involvement of household members in waste segregation	5.00	6.35	0.00
Active participation of HH in the community activities	11.67	9.52	13.85
Community sharing on benefits of the project	5.00	1.59	0.00
Unity in complying with the ordinances, policies, regulations	16.67	68.25	60.00
No answer	10.00	3.18	4.61
Total	**100.00**	**100.00**	**100.00**
Conflicts created or triggered by the sub-projects			
Yes	26.67	19.20	14.00
No	73.33	75.20	83.00
Total	**100.00**	**100.00**	**100.00**
Causes of conflicts			
Health threat of the dumpsite	5.00	4.17	0.00
Perceptions and attitude of the community members	40.00	50.00	85.71
Management problems	35.00	37.50	7.14
Non-compliance with the policies being implemented	5.00	4.17	7.14
Inefficient facility	15.00	4.17	0.00
Total	**100.00**	**100.00**	**100.00**
Reasons for the absence of conflicts			
Helps the community/barangay	5.45	2.13	2.41

Indicators	LISCOP Study Sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
Enhancement of social interaction of the community through the LISCOP sub-projects			
Enhance orderliness and camaraderie in the organization	1.82	3.19	10.84
MRF promoted the recognition of Teresa LGU in the country	1.82	0.00	0.00
Good management of the facility	18.18	6.38	6.02
Unity	5.45	3.19	9.64
WWTF is favorable to the community	1.82	0.00	0.00
Proper implementation of rules and regulation	7.27	1.06	1.21
Promoted happiness within the community	0.00	1.06	1.21
The community members are familiar with each other	3.64	2.13	2.41
No visible unfavorable conditions and incidences brought about by the project	38.18	47.87	42.17
No answer/No idea	16.36	32.98	24.10
Total	**100.00**	**100.00**	**100.00**
Health risks and hazards from the projects			
Yes	30.67	24.80	13.00
No	69.33	69.60	86.00
No idea/No answer	0.00	5.60	1.00
Total	**100.00**	**100.00**	**100.00**
Hazard or danger rate in the community			
0	66.67	68.80	83.00
1	10.67	1.60	2.00
2	9.33	4.80	4.00
3	6.67	12.00	6.00
4	6.67	3.20	4.00
5	0.00	4.80	0.00
No answer/No idea	0.00	4.80	1.00
Total	**100.00**	**100.00**	**100.00**
Hazard or danger rate in the households			
0	77.33	73.60	83.00
1	9.33	2.40	2.00
2	4.00	4.80	4.00
3	4.00	8.80	6.00
4	4.00	3.20	4.00
5	1.33	4.00	0.00
No answer/No idea	0.00	3.20	1.00
Total	**100.00**	**100.00**	**100.00**

In general, the LISCOP sub-projects did not create or trigger conflicts among the community members as cited by most (73%) of the direct beneficiaries, community respondents (75%), and the control respondents (83%). Statistical analysis showed the significantly higher proportion who perceived that the sub-project did not create or trigger conflicts compared to those who said that the sub-projects created or triggered conflicts ($x^2(2) = 6.258$, $p<0.044$) (see **Annex 6**). In some cases, conflicts did happen in the communities because of the perceptions and attitude of the community members themselves as stressed by 40% of the direct beneficiaries, 50% of the community respondents, and 85% of the control group. Specifically, this was observed by most of the ecotourism respondents (77%), 50% of the NRM respondents and some from soil erosion and local flood control (33%), and MRF (29%) as reflected in **Table 8**.

Most of the respondents emphasized that there was no danger nor hazard seen or brought about by the LISCOP sub-projects both at the household and community levels. Results of the Cochran's Q test (see **Annex 7**), however, indicated that there was no significant difference in the percentage of respondents who said that sub-projects in LISCOP as well as the control areas posed no risk, danger or hazard to the household and community ($x^2(2) = 4.326$, $p<0.115$). With a scale from 0 as no hazard/danger to 5 as the highest presence of hazard in the community and in their respective households, most of them answered that, the projects did not pose hazard or danger to their community and households. The responses were common to all four (4) sub-projects which mean that that the implementation did not pose any danger to the people in the community.

In general, the environmental sub-projects such as those of LISCOP and other similar sub-projects, cut across the social, economic and ecological conditions of the community, such that, the security and safety of the communities were not jeopardized in project implementation. This explains why the non-LISCOP communities had similar responses with the LISCOP beneficiaries. As discussed in the previous sections, the non-LISCOP communities could have similar projects such as MRF and ecotourism with that of the LISCOP communities and beneficiaries.

Results of KIIs and FGDs also revealed that in general, LISCOP sub-projects have contributed positively to the overall human being. The LISCOP sub-projects, particularly the MRF served as an opportunity to improve the sanitation of the community by providing materials for the construction of toilet facilities in the community, awareness among the community members about proper waste disposal and management, and provided capability enhancement and training to the officials and key staff of the different LGUs. The sub-projects also enhanced social interactions, communication, and bonding among the community members. Likewise, these projects did not create nor trigger conflicts between and among the community members. More importantly, these projects did not pose any health or security risks among those involved, except for those involved in the MRF. While currently, there had been no reports about the health problems encountered by the MRF laborers, the exposure of garbage collectors and processors could pose some health issues. However, those who were directly involved in the MRF operations were monitored regularly by the Municipal Health Office, and provided with personal protective equipment such as masks.

The box below highlights the specific contributions to the overall human being of the communities involved in the LISCOP sub-projects.

Case 1. Materials Recovery Facility

The LISCOP MRF sub-project has enhanced social interaction as perceived by all of the 10 key informants. Specifically, this project promoted sharing of resources among community members, particularly the organic by-products. An informal group of garbage collectors called the "ecoboys" has also been formed in Nagcarlan, Laguna. The conduct of general assembly and zonal meetings also helped promote the constant interaction of the community members. In Antipolo City, the MRF sub-project paved the way for the institution of a waste segregation system in the community. In Kalayaan, Laguna, there was a decrease in the number of female members of the community who were lazing around in the community. They started involving themselves in clean-up activities. They have learned and gained interest in planting because of the organic compost from the waste materials. In Lucban, Quezon, the community residents themselves, with the assistance of the Municipal LGU, have formulated rules that would enhance their communication and community relationship.

Case 2. Agroforestry and Reforestation Projects

The implementation of agroforestry and reforestation sub-projects has enhanced social interaction, communication, and bonding among the members of the communities; as perceived by two key informants. In Tanay, Rizal, the existing organization of the indigenous people was strengthened because of their project engagement. Meanwhile, the tree planting activities, seminars and meetings that were organized during the implementation of agroforestry projects served as avenues for interaction and bonding of the community members in Pangil, Laguna. These projects did not also create nor trigger conflicts among the community members. No health nor security risks were experienced in the implementation of agroforestry and reforestation projects. Hence, the two sub-projects contributed to the overall well-being of the community members.

Case 3. Soil Erosion and Local Flood Control Projects

The two sub-projects were considered as big help to the community as these addressed flooding problem in the area. These projects have ensured the security of the community members; and, lessened worry and threats for damage to lives and properties. In addition, the community members are now aware about the measures that should be employed when there is flood. They were also taught how to fish as an alternative livelihood when there is flooding. These sub-projects did not also trigger nor created conflicts among the community members.

Case 4. Ecotourism Projects

Three (3) out of five key informants recognized the contributions of the ecotourism projects in enhancing social interaction, communication, and bonding of the community members. In Liliw, Laguna, for instance, the eco-park served as the convergence area of the community members, particularly the senior citizens. Meanwhile, in Majayjay, Laguna, an association was formed to systematically handle tourists and visitors' needs such as food and accommodation, which served also as their income sources. This was done on a "rotation system" to provide equal opportunities to the community members. So far, the ecotourism projects in the five (5) municipalities did not trigger nor create conflicts among the community members. Likewise, these projects did not pose any threat, risk or security issues.

c) Contributions to the management systems of the participating LGUs

The FGD participants stressed that indeed, LISCOP, through their respective sub-projects, has improved the management systems of the LGU-beneficiaries. Specifically, the records and management systems in Tanay, Rizal have improved. The implementation of RA 9003 has improved in Mabitac, Laguna as evidenced by gaining National Awards (*Kalasag* Award, Hall of Fame) and institutionalizing the monthly monitoring of wastes at the barangay level. In Sta. Maria, Laguna, the process flow of services was established and the "no segregation, no collection" policy has been instituted in the municipality. Similarly, the management system has improved in Liliw, Laguna and Angono, Rizal, where the reporting format of World Bank was adopted and improved. In Pakil, Laguna, the MENRO was designated to manage and supervise the solid waste management in the municipality. The establishment of the Pangil River Eco-park Sub-project enabled the Municipal Treasury Office to create a computerized system where tourist arrivals and income were appropriately recorded for transparency. Meanwhile, the LGU in Pila, Laguna was able to enhance their procurement process and monitoring as a result of the harmonization of their current process with that of RA 9184. The LGU in Kalayaan, Laguna has also received a number of awards and recognitions because of their LISCOP sub-projects, which are indications of a well-implemented project. Proper solid waste management monitoring has been installed in Nagcarlan, Laguna, where daily collection of garbage from the public market was properly recorded.

In general, LISCOP was able to provide opportunities to the lower class municipalities to implement their priority projects. LISCOP has also provided opportunities to some municipalities to gain recognition from award-winning bodies on governance and environmental protection. The implementation of LISCOP sub-projects have corresponding challenges and constraints, which provided opportunities to the LGU-beneficiaries for better and stronger leadership.

To test whether the rating outcomes of the respondents in terms of the sub-projects addressing environmental issues, socio-economic contributions, hazard/danger risks, overall success and impact can be attributable to the LISCOP, an Ordinal Logistic Regression Analysis using SPSS was done. The SPSS ordinal outputs are shown in **Annex 8**. The result from the Parameter Estimate table shows an insignificant relationship between beneficiaries (direct or community) in LISCOP study sites and their rating of LISCOP sub-project outcomes/effects. This means that the same level of rating response can also be expected in non-LISCOP area having the same type of sub-project. This is consistently shown in the study where perceived effects of sub-projects implemented in LISCOP areas had statistically similar effects in the control sites (non-LISCOP). These results may be due to the implementation of laws like RA 9003 and government programs (EO 26 implementing the National Greening Program) that directed the management of sub-projects like MRF and reforestation programs implemented in both LISCOP and non-LISCOP sites. Thus, at the sub-project level, there was an observed similarity of effects regardless of study sites.

d) Capacity-building of LGU key staff and community members

Attendance to training

Table 9a shows that 37 out of 180 respondents affirmed that they have attended LISCOP-related training activities across municipalities. Of which, more than one-fourth (43%) were trained on waste segregation. As shown in **Table 9b**, some of the respondents (41%) were trained on the operations of MRF and WWTF such as biogas fogging for mosquitos, charcoal briquetting, paper making, composting, organic fertilizer, pollution control, and

machine operations, and handling of equipment. A few (22%) were trained on different livelihood such as weaving, food processing, entrepreneurship, and organic farming while others (22%) attended training on waste management and segregation. Other trainings attended include disaster risk management particularly on rescue operations (16%) and machine operations and handling of equipment (5%). As a result of the trainings attended, the identified skills that the direct beneficiaries have gained included operations on MRF and handling of equipment (43%), waste management and segregation (27%), rescue operations (19%), and livelihood (21%) as shown in **Table 10**.

Table 9a. Attendance to training of beneficiaries and by sub-project, LISCOP: 2017

Sub-project	Attendance	
	Number	Percentage
Waste Management and Sanitation	32	42.67
Natural Resource Management	0	0.00
Eco-tourism	4	5.33
Soil Erosion and Localized Flood Control	1	1.33
Total	**37**	**49.33**

Table 9b. Attendance to type of training of beneficiaries and by sub-project, LISCOP: 2017

Sub-project/type of training	Attendance	
	Number	Percentage
Waste Management and Sanitation (n=32)		
Waste Management and Segregation	8	21.62
Machine Operations/Handling of Equipment	2	5.41
Operations on MRF and WWTF (biogas, fogging for mosquitos, charcoal briquetting, paper making, composting, organic fertilizer, pollution control, etc.)	13	35.14
Management and Livelihood Training	6	16.22
Disaster Risk Management	2	5.41
Others (planting vegetables)	1	2.70
Sub Total	**32**	**86.49**
Natural Resource Management (n=0)		
No Training Attended	0	0.00
Sub Total	**0**	**0.00**
Eco-tourism (n=4)		
Tour Guide Training and Rescue Operations	3	8.11
Entrepreneurship and Organic Farming	1	2.70
Sub Total	**4**	**10.81**
Soil Erosion and Localized Flood Control (n=1)		
Safety Measures on Flood Prone Areas	1	2.70
Sub Total	**1**	**2.70**
Total	**37**	**100.00**

Table 10. Knowledge and skills gained by beneficiaries in attending the training of the sub-project, LISCOP: 2017

Sub-project/type of training	Knowledge/Skills	
	Number	Percentage
Waste Management and Sanitation (n=32)		
Waste Management and Segregation	10	27.03
Machine Operations/Handling of Equipment	4	10.81
Operations on MRF and WWTF (biogas, fogging for mosquitos, charcoal briquetting, paper making, composting, organic fertilizer, pollution control, etc.)	12	32.43
Management and Livelihood Training	1	2.70
Disaster Risk Management	2	10.82
Planting Vegetables	1	2.70
Sub Total	**32**	**86.49**
Natural Resource Management (n=10)		
No Training Attended	0	0.00
Eco-tourism (n=4)		
Tour Guide Training and Rescue Operations	3	8.11
Entrepreneurship and Organic Farming	1	2.70
Sub Total	**4**	**10.81**
Soil Erosion and Localized Flood Control (n=1)		
Measures on Flood Prone Areas	1	2.70
Sub Total	**1**	**2.70**
Total	**37**	**100.00**

It is interesting to note that most (89%) of the trainees were able to apply the knowledge and skills gained from the training activities (**Table 11a**), highest of which were from waste management and sanitation sub-project type (76%).

Table 11a. Whether applied the knowledge and skills gained by beneficiaries in attending the training of the sub-project, LISCOP: 2017

Sub-project/type of training	Applied knowledge and skills gained	
	Number	Percentage
Waste Management and Sanitation		
Yes	28	75.68
No	4	10.81
Sub Total	**32**	**86.49**
Natural Resource Management		
Yes	0	0.00
No	0	0.00
Sub Total	**0**	**0.00**
Eco-tourism		
Yes	4	10.81
No	0	0.00
Sub Total	**4**	**10.81**
Soil Erosion and Localized Flood Control		
Yes	1	2.70
No	0	0.00

Sub-project/type of training	Applied knowledge and skills gained	
	Number	Percentage
Sub Total	**1**	**2.70**
Total applied	**33**	**89.19**
Total not applied	**4**	**10.81**
Grand Total	**37**	**100.00**

From waste management and sanitation sub-projects, knowledge and skills gained where applied mainly for waste management and segregation (30%) and in the operations of MRF and WWTF (27%).

Table 11b. Application of the knowledge and skills gained by beneficiaries in attending the training of the sub-project, LISCOP: 2017.

How Applied	Applied knowledge and skills gained	
	Number	Percentage
Waste Management and Sanitation		
Waste Management and Segregation	10	30.30
Machine Operations/Handling of Equipment	1	3.03
Operations of MRF and WWTF (biogas, fogging for mosquitos, charcoal briquetting, papermaking, composting, organic fertilizer, and pollution control.)	9	27.27
Management and Livelihood Training	6	18.18
Disaster Risk Management	1	3.03
Others (Planting Vegetables)	1	3.03
Total	**28**	**84.85**
Natural Resource Management		
Not Applicable	0	0.00
Total	**0**	**0.00**
Eco-tourism		
Tour Guide Training and Rescue Operations	3	9.09
Entrepreneurship and Organic Farming	1	3.03
Total	**4**	**12.12**

The survey results were validated by the FGDs conducted in each of the municipalities concerned. Results indicated that except for Baras, Rizal and Majayjay, Laguna, the FGD participants from the different municipalities implementing LISCOP validated that the latter has provided capacity-building activities in various forms. In Tanay, Angono and Taytay, Rizal and Pangil, Nagcarlan, and Rizal, Laguna; the concerned municipal representatives were trained on the technical and administrative aspects of the sub-projects, particularly in the procurement guidelines, preparation of documents, and project operations. Meanwhile, the training in Angono, Rizal; Mabitac, Kalayaan and Liliw in Laguna focused on the technical aspects, particularly on solid waste management, processing of compost, operations of MRF, hollow block and brick making, and production of organic fertilizers for MRF sub-project, and waste water recycling for wetland project. A training for tour guides was also conducted in Liliw, Laguna which implemented the eco-park sub-project. In Sta. Maria, Laguna, however, the representative highlighted that they were trained on conducting feasibility study. A number of training programs were participated by the LGU-Pakil which included Carbon Shed Project Orientation; training on solid waste composting

technologies; environmental and social safeguard training; procurement management; financial management and construction supervision and monitoring. Cross-site visit was also one of the capacity-building activities of LISCOP particularly in Sta. Maria and Mabitac, Laguna. In terms of training application, it was interesting to note that the municipalities were able to apply the learnings from the capacity-building programs. For instance, hollow block making is continuously being done in the MRF of Sta. Maria, Laguna while composting and vermiculture in Liliw, Laguna.

Case 1. Materials Recovery Facility

Seven (7) of the KII respondents expressed that they have attended training on topics that revolved around solid waste management. These included waste segregation, composting, shredding and laminating, and proper waste disposal. It is interesting to note that these respondents were able to apply the knowledge and skills that were acquired from the training activities, particularly brick making and composting.

Case 2. Agroforestry and Reforestation

The LISCOP sub-projects provided capability-building programs for the stakeholders in the two communities. Among the training programs organized in Pangil were abaca weaving, organic farming, fisheries, livestock production using organic materials as feeds, and production of organic pesticides. In Tanay, Rizal, the community members were trained on nursery establishment and management. The knowledge and skills acquired from these trainings were applied in the implementation of agroforestry and reforestation projects.

Case 3. Soil Erosion and Local Flood Control Projects

Apparently, there were no training programs organized in the two communities with respect to the two sub-projects that they have implemented, as reported by the two (2) key informants.

Case 4. Ecotourism

Four (4) out of five key informants recalled that LISCOP sub-projects provided some form of capability-building activities for the stakeholders. These included seminars on solid waste management, waste segregation, management of parks and ecotourism projects, and tour guiding. The knowledge and skills gained on waste segregation were applied in their community.

5.5.4. Unplanned Benefits and Unintended Impacts

Unplanned benefits are positive outcomes that are not foreseen and intended by a purposeful action. These are oftentimes referred to as serendipity or windfall effect of project implementation.

Unintended impacts are unexpected detriment (negative) impact occurring in addition to the desired effect of project implementation. In relation to waste management and sanitation sub-projects, the household survey showed that poor implementation of these sub-projects (especially for those that failed to complete) were caused by: a) low public awareness and attitudes and b) lack or insufficient information. Low public awareness and attitudes could have affected the enthusiasm of the participants to get together or take the initiative to participate in the sub-project. Insufficient or lack of information would result to ineffective and non-systematic management or improper technical work. Ultimately, these aforementioned causes would affect human health and the environment itself.

For projects related to ecotourism, surveys indicated unintended negative impacts during construction activities which harmed the local natural resources (water, soil, and vegetation) and site affecting aesthetic view and visual appeal. Disturbance may favor pest species, exposed soil, and promotion of soil erosion.

5.5.4.1. Waste Management and Sanitation (e.g., MRF and WWTF)

What could go wrong with a project that incentivized citizens about recycling work such as MRF? What could go wrong with a project that enabled many poor people to participate in diverting useful material from going to the landfill while helping them to make ends meet?

The MRF project has its unintended results based on the data generated from the survey and key informant interviews.

MRF as trash bins. In most of the designated areas where tons of garbage have to be sorted and processed, the entire area were covered with garbage making them an eyesore and health hazard. Waste dumps have adverse impacts on the environment and public health like odor and migration of leachates to receiving waters. Discarded tires at dumps collect water, allowing mosquito to breed, increasing risk of diseases such as malaria and dengue. Uncontrolled burning of waste dumps was a major cause of respiratory disease and cause smog. Overall impacts of poor waste management and sanitation will increase incidences of nose and throat infections, breathing difficulties, inflammation, bacterial infections, allergies, and asthma.

Figure 4. Material recovery facility and waste water treatment facility

Poor accounting and record keeping. The economic sustainability of the project becomes questionable as this artificially created economy lacks/ or have inadequate records and accounting to track down on costs and income. Needless to say, the value and recognition for doing proper waste management becomes fraudulent.

Stakeholder behavior and cost-benefit sharing. Stakeholders' response to information available in its immediacy and is oblivious to behavior of the system. Stakeholders' response correspond to different levels of community participation, by showing proper sanitation behavior, contributions in kind or labor, participation in meetings, and administration of solid waste services. With the exception and extraordinary performance of a few municipalities such as Kalayaan and Teresa, engagement by the concerned communities, involving three aspects of responsibility, authority and control, was not very common in waste management sub-project areas.

Another unintended concern/issue of waste management project was in relation to financial matters because these determine the reliability and sustainability of the service (e.g., collection and segregation), notably inadequate fee collection and lack of sanctions for non-payment and non-participation.

5.5.4.2. Natural Resources Management (e.g., agroforestry and reforestation projects)

Natural resources management deals with managing the way in which people and natural landscapes interact. It brings together land use planning, biodiversity conservation and sustainability of industries like agriculture, fisheries, forestry, and tourism. It recognizes that people and their livelihoods rely on the health and productivity of these resources and that people serve as stewards of these resources in order to ensure its health and productivity.

Natural resources are vital for the community's economic, social, and environmental welfare. However, the types of natural resource practice and technology that will be applied could be inimical to both human and the environment. The practice of cutting and burning destroys animals and habitat, exposes the soil to direct sun and rainfall, and this may cause loss of soil fertility and soil erosion. Overgrazing, on the other hand, may cause soil degradation and desertification. The results of this environmental hazard are famine, hunger, and migration.

People in the community could improve natural resource management through improvements in farming practices, land management, and livestock keeping which would significantly reduce emissions, improve productivity, and increase yields – providing additional food and income. Improved forestry practices could create more jobs and expand the local carbon sink even more.

5.5.4.3. Ecotourism (e.g., environmental enhancement and environment improvement)

Ecotourism helps protect natural habitats and pristine environment. It allows communities to build their economies without harming the environment, which means that local wildlife can thrive and visitors can enjoy untouched destinations.

Local jobs are only one of the economic benefits of ecotourism, as well as providing income for those who work at ecotourism sites. Surplus income allows workers and their family members to start up small businesses or to pass on the money to other community members by buying local goods and paying for childcare and other services.

Unfortunately, ecotourism can have damaging effect on the environment. As ecotourism can operate in exotic and fragile places, an increased footfall of eco-tourists can damage these areas. This will also increase pollution and littering. More tourists can also affect the mental well-being of animals, changing their natural characteristics. This can interrupt

mating rituals and animals will scavenge the litter waste, which can bring health issues for them.

The rise in ecotourism can also devalue the culture of a local community. Turning cultural symbols into retail commodities for tourists may bring money but will reduce the value the symbol means to the people. Crime will undoubtedly increase as wealthy foreigners come into the area.

5.5.4.4. Soil Erosion and Localized Flood Control Projects (e.g., flood control project)

Soil conservation promotes soil organisms which in turn, promotes macronutrient availability and increase aeration that ultimately boosts fertility of the soil. It maintains soil pH that normally controls nutrient accessibility to plants and other vegetation. Soil conservation offers the best method of guarding against soil erosion.

Flood control projects are those that are used to help prevent or reduce the destruction of floodwaters. It include facilities such as dams and detention facilities, coordinated operations of the reservoirs with flood control reservations, improvement of flood channels, and levees, watershed management and proper land use planning. All of these things help reduce the impact of flooding and therefore decrease economic and geographic risks that are associated with no flood control.

On one hand, flooding may also be beneficial. Flooding creates and nurtures diverse and complex habitats. The production of new plant and animal tissue normally increases in response to flooding. Plants colonize new areas or take advantage of the increased light that becomes available when old vegetation is cleared away, and animals such as invertebrates and fish often find new food sources. Flooding not only leads to the dispersal and germination of plant seeds but it also results in different kinds of vegetation being able to survive in different locations. Research activities have shown that flooding would sometimes create a mosaic of habitats and biological diversity more than when not exposed to flooding.

5.6. Economic Internal Rate of Return

5.6.1. Assumptions and calculations

Economic measurement of impacts of selected LISCOP sub-projects was based on computing and approximating the beneficiaries' situation with the project to control situations where there was no action or without the project itself. Over a period of five years (2014-2018), provisional services (i.e., incremental benefits) were quantified and valued based on data records provided for in the original feasibility studies available. In most cases where vital records were missing, alternative values were provided taken from areas or sub-project sites approximating similar site or ecosystem characteristics. This technique is called better transfer method, where the ecosystem to which values are transferred is termed the "policy site" and the ecosystem from which the value estimate is borrowed is termed the "study site." For instance, completed MRF sub-project, which specifically defined equipment and building as the accomplishment in Mabitac, Nagcarlan, Siniloan, Antipolo, and Tanay to balance computation of productivity in terms of benefit, the analyst conducted cross-referencing and cross matching of records to establish parameters needed to calculate benefits.

In other environmental/ecosystem service(s) where a particular ecosystem service(s) requires valuation, values were assigned approximating the prevailing market indicators

as per this analyst choice. This method is called revealed preference method. This method assigns a particular market value, of the analyst choice, on a typical ecosystem service that is subject to valuation. For instance, sub-project like ecotourism where a number of visitors were recorded but no values were taken to measure benefit or income. Using a scheme called *hedonic pricing method,* a value is assigned to an ecosystem service which can either raise or lower the base price of a particular non-market environmental benefit generated by using a particular ecosystem or environmental good.

Further to the analysis, the following tabular records were generated:

- *Incremental benefits*. Considered and derived in here as the cash flow of receiving funds from operation. It is a cash flow as a result of the project implementation over the cash flow that would occur if a particular sub-project is not taken. This approach is not the same as comparing that situation "before" and "after" the project. The before-and-after comparison fails to account for changes in production that would occur without the project and thus leads to an erroneous estimate of benefit attributable to the project investment.
- *Costs*. Assumed in here as sunk cost, also known as embedded costs or prior costs which means decisions are taken more on benefits and not on how much money was spent implementing a particular sub-project. A typical justification for environmental projects designed to protect/conserve the environment and at the same time promote livelihood, and sustain income for the concerned local communities. Nevertheless, an inflation of 3.71% (average inflation 2014-2018) was used to spread out its impact on a five-year period.

Annex 9 shows the calculation of EIRR for selected completed sub-projects.

5.6.2. The EIRR results and impact analysis

Following the results of the analysis, the computed EIRR of completed LISCOP sub-projects was 12%. The low 12% may have been due to some intangible benefits the impact of which, were not realistically accounted for in the analysis. For instance, creation of new job opportunities, better health care as a result of more income received by the family and community, better nutrition, and reduced incidence of diseases as a result of improved or better waste management Such intangible benefits are real and reflect true values. They do not, however, lend themselves to valuation. To the best interest of this study, the analyst tried to provide an objective assessment of these intangible benefits and quantified, though, may not necessarily be correct at times.

Impact of intangible goods and services provided for by four sub-project categories:

- *Waste management and sanitation (e.g., MRF and WWTF)*

Material recovery facility accepts materials, whether source separated or mixed, and separates, processes and stores them for later use as raw materials for remanufacturing and reprocessing. The main function of MRF is to maximize the quantity of recyclables processed, while producing materials that will generate the highest possible revenues in the market.

The resources and associated benefit presented in this section have been calculated based on 2014 financial outturn of the concerned municipalities. The methodological differences had to be adjusted in each municipality in order to provide a clearer picture of

MRF service design income, which led to a number of adjustments made to calculate the total income benefit of the project. Income calculation include: material sales, changed collection income, income from recyclable sales, and other income such as employment, facility rentals, etc.

Material proportions and income were based on 2014 data, adjusted to reflect an improved waste collection of 20% of total quantities up to 2018. It is assumed that beneficiaries received 20% total revenue each year beyond 2014 from the sale of recyclable materials, paying the MRF operator fee and other direct income such as employment. It is assumed that as the local economy improves, the price of recyclable materials will increase among others.

Waste water treatment facility, other than its direct monetary benefits, preserves the natural environment. Polluted waters would not end up in rivers and open seas that would cause various risks and other environmental problems. With the facility, no pollution of ground water is effected and discharged other than those designed for the purpose would be significantly reduced, if not eliminated.

- *Natural Resources Management (e.g. agroforestry and reforestation projects)*

Other than those directly calculated using data as provided for in this study, other benefits would include: reduced costs in infrastructure – avoidance of expenditures on protective works, protection of land, buildings, personal property, damage to utilities – telephone, electricity, water supply and sewage, and roads. Also, reduced damage costs in agriculture, reduced public health losses were described but not valued in the report. In this case, *hedonic pricing method* was used to measure certain external perceptual factors that can raise or lower the base price of that good. This is commonly applied where the price of such good is affected by appearance, scenic beauty, and neighborhood demand. The analyst can infer the value of change in the non-market environmental benefits generated by the environmental good.

- *Ecotourism (e.g. environmental enhancement and environment improvement)*

The value of ecosystem services is a reflection of what we, as a society, are willing to trade off to conserve these natural resources. In economic terms, quantifying and valuing ecosystem services are no different from quantifying and valuing goods or services produced by humans. From the economic point of view, one can assign values to ecosystem services to the extent that fulfill our needs or confer satisfaction directly or indirectly. The approach is valuing ecosystem services based on the intensity of change in people's preferences under small or marginal changes in the quantity or quality of goods and services. Benefits from ecosystem services require two main stages, e.g., demonstration of values, and appropriation of values and sharing the benefits of conservation. Demonstration refers to the identification and measurement of the flow of ecosystem services and their values. Appropriation is the process of capturing some or all of the demonstrated and measured values of ecosystem services to provide incentives for their sustainable provision.

- *Soil Erosion and Localized Flood Control Projects (e.g., flood control project)*

The net change in the hectarage of the target ecosystem is the primary driver of environmental benefits analysis. A review of the ecosystem service valuation provides a range of values for flood control project: flood risk reduction benefits, average annual loss estimates, and ability to protect against flood damage. Water quality can be directly

measured; aesthetic and amenity values can also be measured. The economic value of the primary production areas can be utilized, while the landscape may be enjoyed by the outdoor enthusiasts.

6.0 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS (SWOT) OF LISCOP SUB-PROJECTS

The FGD participants articulated the perceived SWOT of LISCOP sub-projects in their respective municipalities.

- ***Strengths***

The establishment of MRF offered advantages to the community. Not only did this facility help in the proper solid waste management of the municipality, but also, it provided a visible evidence that indeed, their municipality complied with RA 9003. The establishment of MRF also created community awareness about proper solid waste management, while at the same time, provided avenues for establishing cooperation between the municipal and barangay governments. The terms and conditions in availing the loan for MRF were acceptable and affordable to the lower-class municipalities. The LGUs' willingness to provide counterpart fund, as well as the availability of lands facilitated the MRF operations. The MRF by-products, particularly the biodegradables that were grounded were dumped into the forestlands, served as organic fertilizers. Meanwhile, the riverbank stabilization and eco-park sub-projects addressed the ecological concerns particularly in minimizing soil erosion, and creating consciousness among the constituents about environmental protection. The eco-park sub-project helped in greening the urban communities, showcasing the tourism potentials of the municipality, and engaging the active participation of the community members including the indigenous communities. The establishment of these eco-parks was made possible because of the presence of natural resources in the municipalities such as waterfalls, rivers, watershed, and trees, as well as the willingness of the community members to participate in tourism activities.

- ***Weaknesses***

FGD results suggested that the weaknesses vary by sub-project. ***Technical and organizational concerns*** were the main weaknesses of MRF projects. For instance, the lack of water facility in Tanay, Rizal constrained them to efficiently operate the facility. This facility did not also generate income as earlier planned by the municipality of Mabitac, probably because of the inefficient production, and the tendency of the community members to avail of free hollow blocks from the facility. In Liliw, Laguna, the high temperature created fire in the landfill. The MRF in Pakil, Laguna had limited capacity and was far from the town proper. In Pangil, Laguna, the weakness of MRF was in terms of manpower support as the LGU had no extra funds to hire additional manpower to implement the sub-project. Meanwhile, the LGU-Rizal, Laguna had only 40-50% compliance in proper solid waste management. In Taytay, Rizal, monitoring of the sub-project was not sustained because of staff transfer. For riverbank stabilization, reforestation, and eco-park sub-projects, on the other hand, the weaknesses were generally ***administrative or management*** in nature. These were insufficient funds in the implementation of riverbank stabilization in Tanay; lack of local communities counterpart in project implementation of eco-park in Tanay; lack of manpower support in the maintenance of the plants within the eco-park in Liliw, Laguna; limited space in Pakil; presence of claimants in Rizal, Laguna; lack of financial and logistical resources (i.e., access roads) for tapping the full tourism potentials of its natural attractions in Majayjay, Laguna.

- ***Opportunities***

The different LISCOP subjects were perceived to offer economic opportunities to the implementing municipalities. The MRF, for instance, was viewed as a potential income-generating project of the municipalities, and could serve as a livelihood activity of the community members, particularly those who would engage in the recycling of wastes, organic fertilizer production, and composting. The MRF operators who were trained on the technical aspects of the facility could capitalize on their knowledge and skills when seeking other employment with similar nature of work. Generally, the MRF could be implemented at lower costs because of the availability of funding via loan, while at the same, would help decrease the volume of solid wastes in the municipality. Likewise, eco-projects were considered as opportunities to enhance the tourism industry in the concerned municipalities; provided livelihood opportunities to the community members, and the watershed could become sources of potable and irrigation waters. The efforts in the establishment and management of the eco-parks could likewise serve as an opportunity to access and tap funds from other funding organizations.

- ***Threats***

Three (3) major threats were foreseen in terms of the sustainability of the MRF project. First is ***health-related threat***, which was brought about by pollution and foul smell from the MRFs. The exposure of the operators and the local community members adjacent to the facility was a major concern and therefore, sustained acceptability from the community may be threatened. Second is ***institutional-related threat***, such as the sustained manpower support, considering that the laborers were just working on a contractual basis, and therefore, they would prefer a more secure job; and the willingness of the new LGU leadership to sustain the sub-project. Third is ***technical-related threat*** such as fire in the landfill because of too high temperature, and breakdown of equipment and dump trucks. On the other hand, the eco-related projects such as riverbank stabilization and eco-park sub-projects were threatened with natural disasters such as forest fires and typhoons, as these areas were vulnerable to extreme weather and climatic disturbances. Anthropogenic issues would also threaten these projects because of the unregulated increase of residential structures and activities within the watershed areas, particularly in Panghulo Watershed and Mt. Ping-as in Rizal, Laguna.

7.0 BEST PRACTICES AND LESSONS LEARNED OF LGUS/ SUBPROJECTS (SPECIAL CASES)

7.1. The Case of Teresa, Rizal: Material Recovery Facility and Learning Resource Center and Eco-park

The Teresa Material Recovery Facility

The Municipality of Teresa is a 2nd class municipality in the province of Rizal. Its population in 2005 was 44,436 which rose to 57,775 in 2015. The surge in population growth was brought about primarily by the boom in real estate in the 1990s and the opening of cement factories, chemical factory, and Teresa marble.

The increase in population meant an increase in the volume of wastes generated daily. In 2005, it was estimated that 3.3 metric tons were generated per day (LLDA, 2017). Hence, it is not surprising that the Municipal Mayor who is a staunch advocate of waste management seized the opportunity to become one of the participating municipalities in the LISCOP project in 2005. It was very timely because the municipality converted their open dumpsite to a controlled dumpsite as provided for in Section 41 of the Ecological Solid Waste Management Act of 2001 (Republic Act 2003) (Congress of the Philippines, 2001) where no open dumpsite shall operate five years after its enactment.

The Teresa MRF is located in Sitio Pantay, Barangay Dalig. As reflected in its mission, the MRF is not only to reduce the volume of waste but also to convert the waste into products to enhance the livelihood of the people. Transforming the image of the municipality as a place to live is also a much-welcome outcome of the project (Box 1). The civil works of the MRF started mid-June of 2007 while the certificate of completion was released during the first quarter of 2008. The MRF facility has equipment including three plastic shredder, hollow block plates, pavement plates, coconet weaving facility, and charcoal maker. The MRF boasts of its facility to have the different chambers for producing organic fertilizer which is absent in most MRFs funded under LISCOP. The MRF maintains an office where pillows are made.

MISSION

- To reduce the volume of residual waste
- To handle proper storage/disposal of hazardous waste
- To meet the needs of local partners by producing quality compost materials
- To enhance income generation of the municipality
- To transform and sustain the image of the municipality as a nice place of abode

VISION

The Material Solid Waste Management Facility (MRF with composting) of Teresa, Rizal shall be an orderly and environmentally friendly place where well-maintained facilities operated by efficient, productive and affordable products for the community.

Box 1: MRF Mission and Vision MRF

As of 2017, the MRF has engaged the services of 24 personnel, 19 males and 5 females for its operation. There were also those who were given access to the facility to segregate wastes composed of 23 females and 1 male in 2017.

The MRF produces a number of products from wastes including construction hollow blocks (CHB), pavement blocks, organic fertilizer, paper charcoal, and pillows (**Figure 5**). Specifically, the paper charcoal and pillows were later additions. The paper charcoal is made of paper wastes from schools, telephone directories, and other paper products donated to the MRF. Meanwhile, the pillows are made from shredded plastics being segregated at the facility.

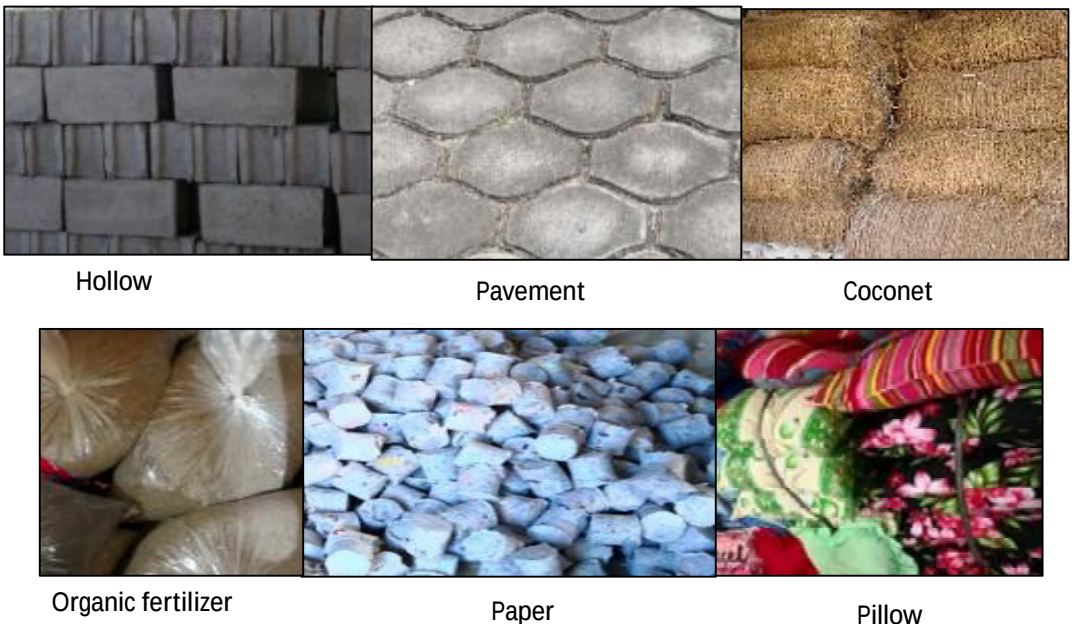

Figure 5. Products from the Teresa MRF

Using the 3rd quarter sales of these products, coconet, and shredded plastics contributed most to the income of MRF. The income though is declining from all the products. It was cited in one of the reports that there was a problem in finding markets for the coconet. Meanwhile, the substantial decline in sales from shredded plastic could be due to the declining plastic wastes being collected through the years. During the visit of the team on February 6, 2018, there were not much recyclable wastes for processing in the MRF.

According to the key informant from the Municipality of Teresa, success in implementing MRF was not easy. It took 13 years before they can say that the implementation was effective. At the start of the project, only 30% of the population complied but this year (2018), 80% of the population complied with the implementation of waste management through segregation. The municipality employed a combination of strategies to motivate the people to reduce wastes before, during, and after the construction of the MRF. Six (6) months before the MRF construction, the LGU organized house-to-house visitation, distributed flyers, posted tarpaulins, and conducted orientations in schools and barangay assembly. After the establishment of MRF, an annual award entitled, “Best Performance in Waste Management” together with a cash gift is given to the top performer.

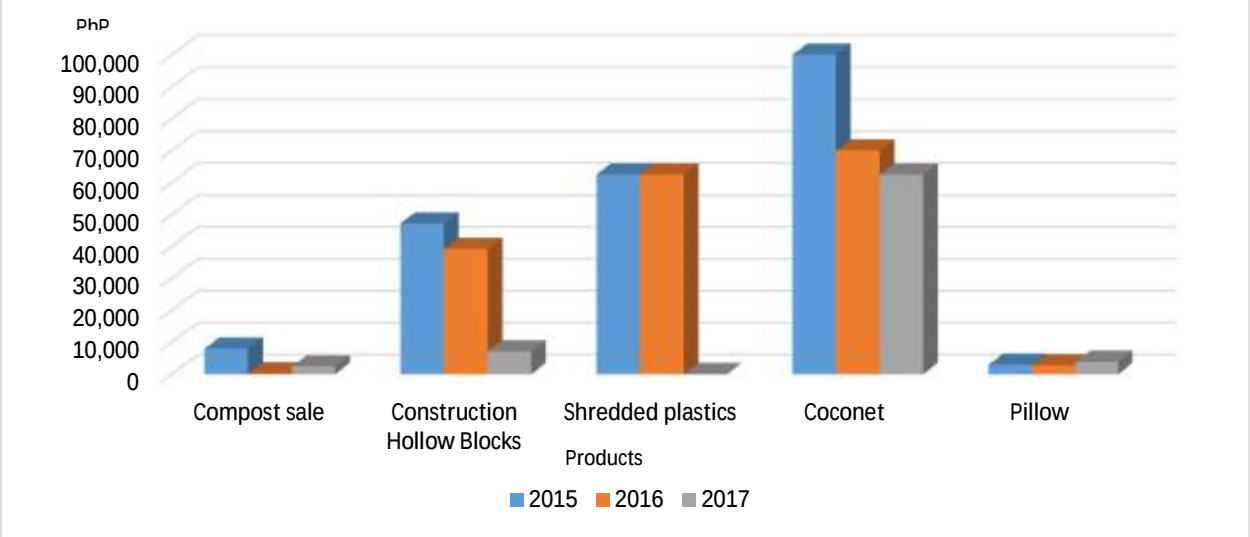

Figure 6. Total Amount of Sales of the Teresa MRF, 3rd Quarter: 2016-2017

For its innovative solid waste management program, Teresa received a special recognition from LLDA in its Public Disclosure Program for the LGUs in 2007. Moreover, the Municipality of Teresa has met the components of the Environmental Management of the Local Government Performance Seal (LGPMS). The municipality met the criteria of having a 10-year solid waste management plan, presence of materials recovery facility (**Figure 7**), and access to sanitary landfill or alternative technology. The local government of Teresa, Rizal was lauded for its Integrated Solid Waste Management Facility (ISWMF) by the National Solid Waste Commission. As one key informant stated, "Teresa has been known for good waste management and many visitors come from other parts of the country to learn from us."

Figure 7. Teresa MRF

The Teresa Learning Center and Eco-park

The Learning Resource Center (LRC) is an aftermath of successful implementation of MRF (**Figure 8**). Together with the LRC is their eco-park that was originally designed to display the possibility of managing wastewater. A key informant shared that, "This time, we proposed a learning center because we do not have a space for training and seminars for the visitors who come and ask for our help (in relation to successful MRF implementation*)."*

The LRC became operational in 2013. It was rented initially by the Office of the Governor of Rizal followed by the Department of Agriculture (LISCOP, 2013). The manager of the LRC mentioned that the workshops and seminars of the municipality are being held in the facility.

At the back of the LRC is the swimming pool which serves as the training venue for the swimmers of Teresa, Rizal who participate in provincial and regional competitions. At the time of the interview in February 2018, the swimming pool could not be used because the water pump was not functional. Farther back of the LRC is the space reserved for eco-tourism purposes. However, the fund from LISCOP was not sufficient to finish the whole project/idea. Still, the local government office of Teresa continues to seek funds to fully accomplish the whole site.

Figure 8. Teresa Learning Resource Center

During the focus group discussion and key informant interviews, several positive outcomes were brought by the MRF and the Learning Resource Center.

- The implementation of the waste management of the municipality had been enhanced;
- Because of the training center, educating the people became easier;
- LISCOP taught us how to properly handle the project budget (financing), and everything that goes with the project for accurate implementation; and
- Gone are the years when unhygienic open dumpsites plagued the communities in Teresa, notably the open dumpsite in Barangay Dalig which was closed in 2004.

On the other hand, the key informants also recommended that to sustain the gains from participating in LISCOP, the local government should be consistent and persistent in informing and educating the people. Social transformation, that is, changing people's thinking and action is difficult. It takes years of continuous reminder, consistent and persistent, to properly inform and educate them on waste management and other development goals.

7.2. The Case of Kalayaan, Laguna: Material Recovery Facility

Formerly called Longos, Kalayaan is located along the south eastern shores of Laguna de Bay, bounded on the north by Paete, on the south by Lumban, on the west by Laguna de Bay and on the east by Mauban, Quezon (**Figure 9**). It has a total land area of 4,660 hectares, and as per 2015 census, with a population of 23,269 people. Among the municipalities of Laguna, Kalayaan, which is roughly rectangular in shape has the least (only three) number of barangays, namely San Juan, and San Antonio on the eastern side which are mostly of terrains 300 meters above sea level and Longos (with a certain portion of Barangay San Juan) on the western side with the lowest elevations of 2 to 5 meters above sea level, that is, towards Laguna de Bay. The highest points of the municipality with elevations of 400 to 418 above sea level are found in Sitio Santo Angel, Malaking Pulo, and Cabuhayan in Barangay San Juan, and Sitio Lamao in Barangay San Antonio.

The LISCOP-supported sanitary landfill and MRF were both 100% completed and operational in 2009. The facility is accessible from the existing first class road which runs along the eastern rim of Laguna de Bay, passing through a winding road towards the steep section of the Caliraya plateau which links up with the road leading to Barangay San

Antonio. Starting off from this road, the MRF site can be reached via a 550-meter long foot trail.

Management and supervision of the municipality's entire solid waste management facility was spearheaded by a Municipal Environment and Natural Resources Officer (MENRO) who was then assisted by the following: three (3) technical staff members (Environment Management Specialist I, clerk, and foreman), three (3) drivers, and six (6) collectors who assisted in the loading and unloading of wastes collected from various areas of the municipality. The MRF composting facilities are manned by seven (7) people, and two (2) security guards who primarily take care of the ensuring safety of all personnel and equipment in the MRF and sanitary landfill.

Figure 9. Map of Laguna showing the location of Kalayaan, Laguna

Sustained Advocacy for Waste Reduction at Source in partnership with other organizations/institutions. The municipality of Kalayaan has always been determined in attaining its advocacy for waste reduction at source. An essential part of the SWM ordinance is the waste segregation scheme directing the people to segregate their waste materials at source as biodegradable, non-biodegradable, and recyclable. Such ordinance had in fact given an opportunity to the community members (households) to generate income by selling the recyclable wastes to the junkshops nearby. In the case of Barangay Longos for instance, residents can bring their recyclables to the barangay where they are given corresponding incentive. Convinced of the benefits of this SWM advocacy, various offices within the municipality of Kalayaan have likewise complied with the ordinance. A number of segregation bins have also been distributed in several public venues such as in schools, municipal hall, and rural health unit, among others.

Educating the children in taking care of the environment even at an early age is a very challenging yet fulfilling task. Hence, in September 2010, the Kalayaan LGU, with the initiative of its MENRO launched the school-based reduction program which called for the involvement of the children in the collection of waste specifically made up of plastic materials to be collected by the municipality, clean and shredded and used as filling for throw pillow cases.

Massive IEC at all levels/sectors - Installation of IEC signages on "BAWAL ANG PLASTIC SA KALAYAAN" *posted on sari-sari stores.* Such signages not only served as a constant reminder but also to instill discipline among community members on proper solid waste management.

Source: Current Status of SWM Program: A PPT Presentation, 2017

Figure 10. Campaigns and signages in Kalayaan, Laguna

Establishment of MRFs for each barangay. The LGU of Kalayaan called for the establishment of MRF in each of the three barangays through a municipal ordinance in 2014, enjoining their full support and cooperation in proper waste segregation, maintenance of cleanliness and protection of the environment.

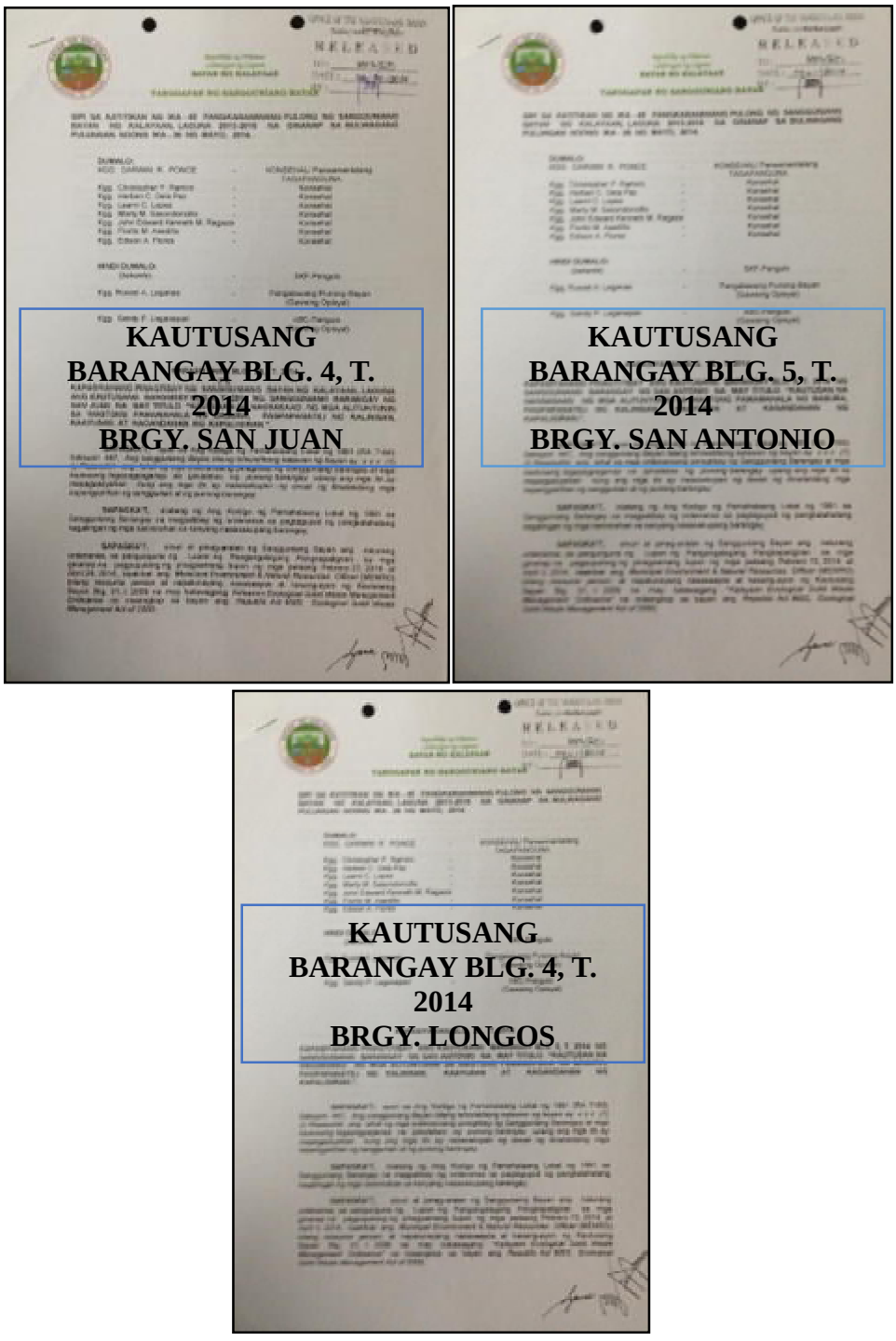

Figure 11. Municipal ordinances in 3 barangays in Kalayaan, Laguna

Increasing consciousness of maintaining cleanliness and awareness among community members on benefits of organically grown food. From their usual practice of loitering, the female members of the community became more productive by engaging themselves in barangay clean-up activities. Likewise, they gained interest in planting, given the availability of organic compost that they can use to enhance the growth of their planted vegetables, medicinal and ornamental plants, among others.

Source: Current Status of SWM Program: A PPT Presentation, 2017

Figure 12. Backyard gardens in Kalayaan, Laguna

Establishing partnership towards established market of recyclables. Acknowledging the availability of established markets for recyclables facilitates immediate generation of income for people who are involved in this component activity of the overall SWM scheme. As it generated income, a significant number of households were benefitted thereby giving them the opportunity to support their family's basic needs. The memorandum of agreement between LGU Kalayaan with each of the three barangays and the Gloria Junkshop conveyed mutual benefits, at the same time strengthened collaboration for future related community activities -- they were considered as partners in this noble advocacy.

Shredded Plastic Waste hauled to
CEMEX Cement Plant in
Antipolo City

0.54 tons in
CY 2015

Figure 13. The MRF in Kalayaan, Laguna

Other achievements as an offshoot of advocacy relative to SWM. As an offshoot of LGU Kalayaan's SWM initiatives which in addition to compliance with RA 9003 has been supported and inspired by LISCOP, it has developed regular program of activities such as the river clean-up and tree planting activities in partnership with various organizations. A more significant recognition of such sincere and committed efforts for the LGU was being a gold awardee for Environmental Compliance Audit (ECA) from the Department of Interior and Local Government (DILG) for two consecutive years (2015 and 2016).

7.3. The Case of Rizal, Laguna: Ecotourism

Rizal is an inland and a 5th class municipality, meaning one of the poorest municipalities within the 3rd district of the province of Laguna. Named after the country's national hero Dr. Jose P. Rizal, the municipality is located 25 kilometers from the provincial capital, Sta. Cruz and is bounded on the north, east, west and south by the municipalities of Calauan, Nagcarlan, San Pablo City and Dolores, Quezon, respectively (Figure 14). Among its major vegetation are coconut trees as it is surrounded by the foothills of Mount San Cristobal, Mount Banahaw and Bisilin Hill. Agriculture and ecotourism are the main livelihoods of the people.

Figure 14. Map of Laguna showing the location of Rizal, Laguna

Rizal is politically subdivided into eleven (11) barangays, including Antipolo, Entablado, Laguan, Pauli 1, Pauli 2, East Poblacion, West Poblacion, Pook, Tala, Talaga and Tuy. As per 2015 census, Rizal has a population of 17,253 individuals. Considered as a largely agricultural community, Rizal also brags of its potentials for ecotourism development in view of Tayak Adventure, Nature and Wildlife Park (TANAW).

Encouraged to join LISCOP because of the potential funding opportunity. Rizal is a poor municipality with only PhP2 million income a year which is barely enough for the day-to-day operations of the local government. It is imperative for the LGU to take advantage of such funding opportunity amidst lack of technical expertise to work on voluminous paper requirements for sub-project approval. The feasibility study for the sub-project was done by the LGU alone. They did not hire a consultant to save money.

Determination to push through despite minimal/decreased funding support and limited time of implementation. Due to meticulous processing of papers for application to LISCOP sub-project, it took the LGU of Rizal almost 3 years (from 2011 to 2014) to complete and have it approved. At that time, the LISCOP project was about to end and they were told that they need to use all of the funds in just three (3) months; hence, they only availed P4 million, instead of P12 million funding as proposed (worked on the given/available budget while at the same time explored other funding opportunities).

Initiative to establish partnership with other institutions not only for funding but also for continuing development of the sub-project. Through the initiative of the Mayor, partnership with the Department of Tourism which provided a total budget of PhP20 million was sought to continue with the unfinished construction and development activities at the TANAW Eco-park.

LISCOP supported the ecotourism project, particularly the TANAW Eco-park which opened a venue for the often negative connotation or impression of the place and the people of Rizal themselves to become a positive one --- Tayak Hill/Tayak Eco-park. “Tayak” was derived from the “alias” of cattle rustlers that reside in the area; it gave a negative impression on the people in Rizal.

Revenue generation from TANAW Eco-park. According to the Municipal Treasurer of Rizal, with the present entrance fee of PhP30.00/person, they started to monitor the income of Tanaw Park in 2015 with a collection of PhP391,330.00. With the progressive development of the site, there was a rapid increase in the income of Tanaw Park such that in 2017, they collected an income of about PhP1,248,750.00. This is because aside from the increase in the number of tourists, it was also opened as a venue for different activities such as wedding ceremonies, pre-nuptial pictorial, among others. For the first four months of 2018, there was a significant increase in the income generated because they were able to collect an income of PhP895, 280.00. Given this, the Honorable Mayor also expressed that they may be able to pay the remaining amortization of their loan this year.

Likewise, the continuing operation of Tanaw Park has created livelihood to the community residents (i.e., sale of their farm produce, establishment of small eating facilities for visitors/tourists, and hikers. They were also tapped for emergency manpower support for the on-going construction/development activities. A proposed sharing in income shall be discussed and agreed upon among the LGU, the host barangay, and the DENR (**Figure 15**).

Figure 15. Revenue of Rizal Tanaw Park, 2015-2018

Awards Received by LGU Rizal in recognition of Tanaw Park Development

- Tourism Excellence Award for Local Government (November 2017)
- Accredited Tourism Area of Department of Tourism CALABARZON (2015)
- World Water Day Awards LLDA Kampeon ng Lawa: Tanaw De Rizal (March 2018) – this was because of the tie-up with Republic Cement and the establishment of Tanaw de Rizal
- Tanaw Park is also known as a biker’s haven and famous pilgrimage area, especially during the observance of the Holy Week
- Beneficiary of Corporate Social Responsibility (CSR) with the help of Haribon Foundation since 2013 up to present for reforestation.

Figure 16. Tanaw Park in Rizal, Laguna

7.4. The Case of Baras, Rizal: Flood Control

Baras is a 4th class municipality in the province of Rizal. According to the 2015 census, it has a population of 69,300 people. The sub-project on flood control was identified as among the priority projects of the municipality during the Laguna de Bay Watershed Environmental Action Planning (LEAP) workshop in 2007, encompassing about 3.5 kilometers of Baras River traversing Barangays Mabini, Santiago, Evangelista and San Juan. The primary objective of the sub-project is to protect properties from the unstable character of the banks of Baras River. Subsequently, it addresses problems of bank erosion and scouring which are often endangering the lives and properties of residents in the area. Likewise, it seeks to solve regular problem on flooding in the poblacion area and the estuarine areas of Barangays Santiago and Mabini due to the deposition of sediments on the riverbed as well as the narrowing of the river's mouth due to accretion.

Figure 17. Baras Baywalk

Generation of employment during the facility construction stage and significant protection of lives and properties. This project has generated employment for the residents of the host community, particularly during the construction stage of the project as an offshoot of the LISCOP-supported flood control project. The flood control sub-project (riprapping) has significantly provided protection to lives and properties, including farm areas in that particular location of Baras, Rizal.

Recognizing the potentials for ecotourism development as a baywalk and an area for wellness and aesthetic-related activities. Given the significant protective effect of the 520 meter-riprap which the LISCOP sub-project has primarily provided to the riverbank, the municipal government of Baras also visualized the potentials of further developing the area. Hence, the municipal government was encouraged to purchase an originally 2.9 hectare adjacent private property for several purposes. A new municipal building is planned to be built in the area along with other facilities/attractions for farm-related tourism such as a lagoon for air gun fishing, and where community members could also raise and collect *kangkong* as a means of livelihood. Another livelihood activity would be for small boat owners that could bring interested people around the lake for sight-seeing and appreciation of the lake ecosystem for a minimal fee of PhP100/person (each small boat could accommodate around 4 to 5 passengers/trip).

With funds from the provincial government, the municipal LGU of Baras was able to construct/improve the road within the property which aesthetically serves as a jogging area for a number of community members, and an area where families can have their relaxation/picnic and bonding especially during weekends.

To maintain safety and cleanliness within the area, the LGU of Baras has already established a gate manned by an LGU-compensated staff to control the entry of motor vehicles that could otherwise cause some accident or harm to the people who are using

the area for their regular walking, jogging, and zumba activities. Likewise, solar lighting facilities and a number of tables and seats to accommodate visitors and community members were purchased and installed.

Under the LGU Baras' 6K agenda, particularly the Kaligtasan ng Comunidad ng Baras ay Prayoridad (KCBP), the commitment to complete the desired development for ecotourism as an offshoot of the LISCOP flood control project is soon to be realized.

Figure 18. Recreational activities in Baras Baywalk

Figure 19. The site design of Baras Baywalk

8.0 CHALLENGES AND PROSPECTS IN PROJECT IMPLEMENTATION

Similar with other development projects, the implementation of LISCOP sub-projects were also bound with challenges, problems, constraints, and prospects. FGD results suggested that there were four major problems encountered in the implementation of the different LISCOP sub-projects in the four provinces. The first problem revolved on the ***administrative and management*** *processes* aspect such as difficulty in complying with documentary requirements for the MRF sub-projects in the case of Tanay, and Nagcarlan; difficulty in securing permits with the cultural minorities and delayed release of funds in the case of Tanay, Rizal; unavailability of land for MRF project in Rizal, Laguna and Baras, Rizal; limited funds for acquisition of equipment and site maintenance (wetland) in Rizal, Laguna and Angono, Rizal, respectively. In relation to their eco-park projects, it took them three (3) years to complete the processing of papers for application, and by that time, the LISCOP project was about to end. Hence, they only availed PhP4M instead of PhP12M fund support. Likewise, LGU Rizal's training programs were not completed because of limited fund and time. In the case of Sta. Maria, Laguna, it was difficult for them to prepare the feasibility study because of other LGU activities. The LGU in Pakil experienced voluminous paper works as well as operational gaps because of the use of new equipment and composting technologies. Meanwhile, in Liliw, Laguna, the construction of the eco-park should have covered the Kilangin Falls. However, it was prevented by the Protected Area Management Board (PAMB) being a declared protected area.

The second problem lies with the ***technical aspects and concerns*** such as the mechanical problems of the MRF equipment in Liliw; substandard quality of the facility as experienced in the MRF project of Liliw and Pila; and the high cost of maintenance of MRF in Pila. The third problem revolved around the ***non-compliance and limited acceptance of the MRF among the community members*****.** The municipalities of Mabitac and Sta. Maria, Laguna and Taytay, Rizal encountered problems on the non-compliance of some community members on proper solid waste disposal. There were LGUs in Mabitac, Sta. Maria, and Pangil which found it difficult to convince community members to accept the project because of the notion that the foul odor would bring to the community. The fourth problem was ***natural calamities*** such as typhoons, which damaged the physical facilities in the Eco-Park being maintained by the municipality of Liliw, Laguna.

The following describes the specific problems encountered by the LISCOP sub-projects and how these were addressed, based on the articulation of the key informants.

Case 1. Materials Recovery Facility

The existing MRF does not have the capacity to accommodate the volume of waste from the 20 barangays of Nagcarlan, Laguna. Thus, only biodegradable materials are being processed in the said facility; the equipment is not functional. To address this problem, the recyclable materials were brought to the barangay MRFs and were processed for several by-products such as briquettes, pillows, etc. The LGU has also explored ways of repairing the equipment to make it functional. To fully achieve the goal of solid waste management, the use of plastics should be strictly prohibited at the households and market facilities. It was also difficult to get 100% compliance in terms of proper waste segregation. Thus, continuous IEC is being done in the most diplomatic way, emphasizing on the sanctions, benefits, disadvantages, etc. Additional manpower (street sweepers) was also employed to maintain cleanliness. Meanwhile, in Angono, Rizal, there is a need to rehabilitate the area for recyclable waste materials. This is because currently, they have very limited space for this. In Kalayaan, Laguna, the problem on wastes was usually caused by stray dogs, and thus, the community members were advised to have their dogs caged or corralled. There is also a need to expand the MRF to provide a place for recyclable materials, which could be an additional source of income for the community members. In Lucban Quezon, there used to be a problem on the competition for recyclable garbage collection in the absence of a system for collection. Through time, however, they were able to control the number of garbage collectors, following an income-sharing system.

Case 2. Agroforestry and Reforestation Projects

The problems encountered by the project implementers in Tanay, Rizal were administrative in nature. These include the delay in fund release, which caused the delayed wages of community members involved in nursery and plantation establishment. There is a need to sustain their reforestation project by continuing their planting, replanting, and maintenance, as well as hiring additional manpower. Meanwhile, in Pangil, Laguna, the problem encountered was brought about by natural calamity, particularly typhoon, which caused mortality of some livestock. To address this problem, the implementers established a better and safer shelter for the livestock. The LGU should sustain its IEC about proper livestock production as a component of their agroforestry project.

Case 3. Soil Erosion and Local Flood Control Projects

There were no problems encountered so far by the communities implementing the two sub-projects. However, there is a need to expand the area for the drainage system considering that the community is a flood-prone area. In addition, it may be better if the height of the riprap could be 2 feet higher for it to be more effective.

Case 4. Ecotourism Projects

Since ecotourism projects involved tourists and individuals from other communities, the concerned municipalities were faced with few challenges such as ensuring the safety of the tourists, engaging the cooperation of tourists (some of them could not be restrained from picking fruits and farm produce from nearby farms), and managing the volume of wastes left by the tourists. Thus, among their recommendations are: a) the need for a 24-hour patrolling from the barangay; b) continuous awareness building and IEC; c) establishment of additional MRF to accommodate increasing volume of wastes; d) increase the fees from P275/person to P285/person. The additional P15/person shall be shared among the landowners of properties nearby Tibatib Fall; and, e) strictly instituting policies for tourists to be extra careful of their belongings; bringing of alcohol, especially bottled drinks are not allowed inside the park.

On the contrary, survey results showed that majority of the respondents (63% for ecotourism; 59% for waste management and sanitation; and 50% each for natural resource management and soil erosion and localized flood control) across the four sub-projects claimed that there were no problems encountered during project implementation. Although, there were some respondents (42% for soil erosion and localized flood control; 40% for natural resource management; 35% for ecotourism and 33% for waste management and sanitation) who reported some problems that were encountered during project implementation in their respective communities (**Table 12**).

Table 12. Problems encountered in the implementation of the sub-project, LISCOP: 2017 (in percent)

Problems encountered	Waste Management and Sanitation	Natural Resource Management	Eco-tourism	Soil Erosion and Localized Flood Control
There are problems during project planning and implementation	32.58	40.00	34.78	41.67
There are no problems during project planning and implementation	59.09	50.00	63.04	50.00
No idea	8.33	10.00	2.17	8.33
Total	**100.00**	**100.00**	**100.00**	**100.00**

The different LGUs have explored possible strategies to address their problems. For instance, LGU-Tanay, Rizal has ensured its compliance with the requirements of the National Commission on Indigenous People (NCIP) to be able to secure the required permits from the indigenous communities. Meanwhile, the LGU has dropped the funded projects because of difficulty in securing documentary requirements, particularly in their reforestation project in Sitio Tablon, Barangay Cuyambay. Meanwhile, in Mabitac, Laguna, the MRF was established in the government land property in the absence of willingness and interest from the barangays to install the facility in their respective areas. The LGU has also requested the LLDA to conduct an orientation to concerned community members to provide them an overview about the MRF. To gain the interest and acceptance of the community members about the MRF, LGU-Sta Maria organized a cross-site visit to the MRF of Teresa, Rizal to showcase the operations of MRF and highlight the benefits that would be derived from this facility. In Liliw, Laguna, the Municipal Environment and Natural Resources Office (MENRO) initially funded the repair of the machines to enable the efficient operations of the MRF. However, the FGD participants stressed that LISCOP should see to it that the warranty of the equipment should be strictly followed to ensure sustained operation of the MRF.

In terms of the eco-park establishment, LISCOP helped the LGU to look for an alternative area for Kilangin Falls. In Pakil, Laguna, numerous consultations were organized to educate the community about the MRF project. Hiring and training of additional personnel were likewise employed to help facilitate project implementation. To ensure the sustainability of their project, a 1-year solid waste management plan was formulated. Meanwhile, the LGU in Pila bought a multi-shredder and truck to make the facility functional. Their MRF now serves as the temporary storage of the municipal equipment and tools. In Rizal, Laguna, the LGU bought a land where the MRF was put up. They were able to source out funds from Senator Cayetano to purchase shredder for plastics, while the shredder for biodegradables was given as award for Seal of Good Governance. The LGU also allocated funds amounting to PhP 700,000 to build a shed. To help enhance their eco-park projects, LGU Rizal tapped support from the Department of

Tourism (DOT). To address the issue of land acquisition for its MRF project, the LGU in Baras, Rizal made a series of negotiations and issued a formal offer to the lot owner. The LGU in Taytay, Rizal assigned a technical personnel to focus on the preparation and submission of documentary requirements. In Angono, Rizal, a "No segregation, No collection" policy was implemented to ensure compliance of the community members in relation to proper solid waste disposal. The LGU also requested that each barangay should have its own MRF. In relation to the wetland sub-project, LGU Angono has been organizing community awareness program particularly on the reuse of gray water. It also allocated funds for the maintenance of the facility through the Office of the Municipal Agriculturist.

Meanwhile, the status of LISCOP sub-projects is also defined by how the elements of the projects helped and facilitated or to some extent, hindered and constrained the project implementation. **Table 13** shows that more than one-third (39%) of the direct beneficiaries recognized the active role and support of the LGUs as the main facilitator in project implementation. Primarily, the LGUs were the direct implementers of the project, and therefore, the manner by which they managed and administered the projects influenced the outputs and outcomes of project implementation. In addition, the realization of the environmental protection and enhancement by all levels and sectors was also essential in project implementation as noted by 31% of the control respondents; 17% of the direct beneficiaries, and 12% of the community respondents. If all the constituents share the same vision of environmental protection and conservation, then, each of them would surely take effort to make a difference in their respective communities. Furthermore, some (16% direct beneficiaries; 20% community members; 8% control respondents) noted that the compliance of the community on the requirements of the sub-projects facilitated project implementation.

Table 13. Facilitating factors in LISCOP sub-project implementation, LISCOP: 2017 (in percent)

Facilitating factors	LISCOP study sites		Control (n=100)
	Beneficiary (n=75)	Community (n=125)	
Realization of environmental protection and enhancement	17.33	12.00	31.00
Active role and support of the local government units	38.67	13.60	19.00
Municipality's tourism potentials	5.33	3.20	2.00
Presence of support system and mechanism	5.33	5.60	1.00
Compliance with the requirements of the municipality	16.00	20.00	8.00
Potential for income generation	1.33	5.60	5.00
Availability of land or enough space for the project	6.67	13.60	21.00
No idea	9.33	26.40	13.00
Total	**100.00**	**100.00**	**100.00**

9.0 BEST PRACTICES AND LESSONS LEARNED IN PROJECT IMPLEMENTATION

While there were problems identified during the project implementation, there were also best practices documented. Topping the list of best practices across all four projects were the regular collection of waste/garbage and instilling discipline to the community and the LGUs. Aside from regular collection of wastes, the respondents also mentioned the strict implementation or enforcement of policies, rules and regulations, and immediate action to problems. Other best practices cited are presented in **Table 14**.

Table 14. Best practices in the implementation of the LISCOP sub-projects, LISCOP: 2017 (in percent)

Best practices	Waste Management and Sanitation (n=132)	Natural Resource Management (n=10)	Eco-tourism (n=46)	Soil Erosion and Localized Flood Control (n=12)
Regular monitoring during establishment/construction of the sub-project	1.89	0.00	2.94	12.50
Continuous IEC to increase awareness	3.77	0.00	5.88	0.00
Continuous improvement/refinement of design and operation	1.89	0.00	0.00	25.00
Strict implementation/ enforcement of policies, rules and regulations	13.21	16.67	26.47	25.00
Promoting collaboration and cooperation between LGU and community in project implementation	0.00	0.00	0.00	0.00
Blending of the sub-project with the natural features of the community	1.89	0.00	0.00	0.00
No segregation-No collection policy	0.00	0.00	2.94	0.00
Training of sub-project implementers (e.g. tourist guide)	1.89	0.00	0.00	0.00
Waste segregation and management	4.72	16.67	5.88	0.00
Regular collection of waste/garbage	52.83	16.67	2.94	25.00
Establishment of waste/garbage barangay collection areas/zones	0.94	0.00	0.00	0.00
Barangay clean-up drive and tree planting activities	0.94	0.00	0.00	0.00
Immediate action to the problems	0.94	33.33	23.53	0.00
Provision of additional equipment	0.94	0.00	0.00	0.00

Best practices	Waste Management and Sanitation (n=132)	Natural Resource Management (n=10)	Eco-tourism (n=46)	Soil Erosion and Localized Flood Control (n=12)
Health awareness	1.89	0.00	0.00	0.00
Unity for promotion of tourism and conservation of environment	1.89	0.00	0.00	0.00
Instilling discipline to the community and LGUs	3.77	16.67	26.47	12.50
Additional livelihood	5.66	0.00	2.94	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**

The lessons learned by the respondents' during the project implementation vary among the sub-projects. They mentioned several lessons in waste management and sanitation, ecotourism and soil erosion, and localized flood control but few for natural resource management projects. Common lesson learned to all was the unity among community members to facilitate project operations and conservation of environment. They also learned that it is important to carefully plan, design, and improve structures to make it usable; the importance of proper waste/garbage segregation, composting and other MRF operations; and organic agriculture. Other lessons learned are shown in **Table 15**.

Table 15. Lessons learned in the implementation of the LISCOP sub-projects, LISCOP: 2017 (in percent)

Lessons learned	Waste Management and Sanitation (n=107)	Natural Resource Management (n=3)	Eco-tourism (n=32)	Soil Erosion and Localized Flood Control (n=9)
Human/social interaction skills for better cooperation in project implementation	3.74	0.00	12.50	0.00
Need for better selection/screening process for project contractors/stakeholders	2.80	0.00	0.0	0.00
Discipline needed on proper waste/garbage segregation	7.48	0.00	9.38	11.11
Need for community consultation and dialogue	1.87	0.00	0.00	11.11
Cleanliness on project areas for improved aesthetics/presentability to attract visitors	3.74	0.00	0.00	11.11
Strict enforcement/observance of rules, laws, policies and regulations	2.80	0.00	0.00	0.00
Unity among community members to facilitate project operations and conservation of environment	6.54	33.33	37.50	22.22

Lessons learned	Waste Management and Sanitation (n=107)	Natural Resource Management (n=3)	Eco-tourism (n=32)	Soil Erosion and Localized Flood Control (n=9)
Proper waste/garbage segregation, composting and other MRF operations	58.88	0.00	6.25	0.00
Waste recycling and banning of plastic	7.48	0.00	0.00	0.00
Organic farming/agriculture	0.93	33.33	3.13	0.00
Additional alternative livelihood and other opportunities	2.80	0.00	3.13	0.00
Carefully plan, design, improve structures to make it usable	0.00	33.33	9.38	33.33
Trainings on communication and safety measures	0.00	0.00	15.63	0.00
Report problems immediately	0.00	0.00	0.00	11.11
Change the design of the facility	0.93	0.00	0.00	0.00
LGUs to open central project management unit	0.00	0.00	3.13	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**

Overall, the lessons learned and best practices are presented to demonstrate the importance of active engagement of stakeholders in project implementation. Lessons highlight strengths or weaknesses in preparation, design, and implementation that affect performance, outcome, and impact.

The following lessons learned and best practices were extracted from interviews, survey, and consultations from concerned stakeholders, and analyses of records and secondary data of LISCOP sub-projects implemented in the concerned municipalities. Such presentation is provided in alignment with the stated objectives of this impact evaluation study, to wit:

- *Increase in the participation and involvement of communities and other stakeholders leads to decrease in negative impacts*

  - Best Practice 1. Participatory approach and consultations conducted were a key mechanism for interaction with concerned/affected stakeholders and communities and allowed for better understanding of issues related to sub-project intervention activities and objectives.
  - Lessons Learned 1. People who were affected, directly and indirectly benefitting from the project implementation, have developed an attitude and practice of collectively keeping their surrounding areas clean, and support the intentions of project intervention.
  - Best Practice 2. Engaging stakeholders in every aspect of project preparation and implementation offers many advantages.
  - Lessons Learned 2. Constant stakeholders' engagement often facilitated efficient channeling of resources and technical expertise for adaptation actions, and many of the bottlenecks have been addressed.

- *Institutional Strengthening*

  - Best Practice1. Design of an effective institutional framework would help promote successful sub-project implementation. Such framework would cover: training workshops, provision of tools and equipment, open channel of communication, exchange of information, etc.
  - Lessons Learned 1. Continued support, regular interaction, and stakeholder cohesion in the sub- project implementation. The survey results revealed that better interaction promoted greater transparency in exchange of information, a clear understanding of each other's roles and responsibilities, a better ownership of the projects and more realistic expectations regarding the whole process.
  - Best Practice 2. Better design of implementation strategy can improve the effectiveness of project implementation
  - Lessons Learned 2. It was noted during interviews that no clear guidance on policy and project design was provided at the early stage of project implementation. This has resulted in a number of transitional arrangements which have resulted in considerable delays in project implementation.

10.0 OVERALL RATING OF LISCOP SUB-PROJECTS

The survey respondents rated the overall success of the four LISCOP sub-projects, with 5 being the highest and 1 as the lowest. The overall rating of LISCOP varied in terms of the sub-projects. For instance, the soil erosion and local flood control, MRF, and ecotourism sub-projects elicited a rating of 4-5 (high to very high) from 75%, 58% and 50% respondents, respectively, while the natural resources management sub-project got a rating of 3-4 (moderate to high) from 70% of the respondents as shown in **Table 16**.

Table 16. Overall success of LISCOP sub-projects, LISCOP: 2017 (in percent)

Overall success rating	Waste Management and Sanitation (n=132)	Natural Resource Management (n=10)	Ecotourism (n=46)	Soil Erosion and Localized Flood Control (n=12)
1	4.55	10.00	10.87	0.00
2	4.55	10.00	8.70	16.67
3	28.79	30.00	30.43	8.33
4	24.24	40.00	23.91	41.67
5	34.09	0.00	26.09	33.33
No idea/No answer	0.00	10.00	0.00	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**

The benefits derived by the households and the communities from these sub-projects were the primary reason for the high rating given to the three sub-projects mentioned above (waste management and sanitation, 16%; ecotourism, 28%; and soil erosion and local flood control, 17%). Other reasons for success included improved environmental quality and reduced hazards and risk to the communities' effective project management and implementation; and opened opportunities for employment. On the other hand, low to moderate rating was given to the sub-projects because of the lack of cooperation and participation from the community members particularly in the natural resource management and MRF sub-projects as noted by 11% and 12% respondents, respectively. Some respondents also noted that the projects were not functional (2% MRF; 22% natural resource management), and did not provide significant economic benefits to the households and the communities (2% in MRF; 4% in ecotourism; 42% in soil erosion and flood control) as shown in **Table 17**.

However, while the respondents differed in their rating on the sub-projects, majority (waste management and sanitation, 89%; natural resource management, 60%; ecotourism, 67%; and soil erosion and local flood control, 92%) agreed that they were satisfied with how the sub-projects were implemented in their respective communities. In general, the LISCOP sub-projects have addressed the environmental concerns and issues of the participating LGUs, while at the same time, provided social and economic contributions to the households in particular, and to the communities, in general.

Table 17. Perceived reasons for overall success rating by the LISCOP beneficiaries, LISCOP: 2017 (in percent)

Perceived reasons for the overall success rating	Waste Management and Sanitation (n=128)	Natural Resource Management (n=9)	Ecotourism (n=46)	Soil Erosion and Localized Flood Control (n=12)
The subproject provided benefits to the household and community	13.28	0.00	19.57	16.67
The subproject improved environmental quality and reduced risks/hazards	10.16	0.00	4.35	8.33
The subproject was not functional/operational	0.78	11.11	0.00	0.00
Lack of cooperation, discipline and participation from community members	11.72	0.00	8.70	0.00
Absence of socio-economic benefits to household and community	1.56	0.00	2.17	41.67
Effective subproject implementation/management	24.22	11.11	8.70	0.00
Immediate action to the problems	1.56	0.00	0.00	0.00
Awareness on the importance of cleanliness in the community	4.69	0.00	0.00	0.00
Equipment/buildings non-functional	0.78	11.11	0.00	0.00
Opens employment opportunity	2.34	11.11	4.35	0.00
Good relationship among co-workers/community	1.56	0.00	0.00	0.00
The sub-project functions well	2.34	0.00	0.00	0.00
The sub-project can be improved (additional buildings, improved landscape)	4.69	11.11	10.87	33.33
The facility is not yet complete (i.e., Lack of sanitary landfill, equipment)	3.13	0.00	4.35	0.00
The sub-project was not improved because it was not priority of the presiding administration	1.56	0.00	0.00	0.00
Presence of socio-economic benefits to household and community	3.13	0.00	8.70	0.00
Lack of labour force	0.78	0.00	0.00	0.00
Water quality is not improved	0.78	11.11	0.00	0.00
Fruit of planted trees is not realized	0.00	11.11	0.00	0.00
The workers must be well-trained	0.00	11.11	0.00	0.00
The facility is not fit to the environment	0.00	0.00	4.35	0.00
Helps promotes tourism	0.00	11.11	6.52	0.00
Workers in bad terms to their co-workers	0.00	0.00	2.17	0.00
Lack of funds	0.00	0.00	2.17	0.00
Ineffective waste management	4.69	0.00	0.00	0.00
Minimal contribution to socio-economic of the community	0.78	0.00	2.17	0.00
Irregular collection of wastes	0.78	0.00	0.00	0.00
Absence of monitoring	0.78	0.00	0.00	0.00
Lack of safety measures to the community/project site	3.13	0.00	0.00	0.00
Lack of information dissemination	0.78	0.00	0.00	0.00

Perceived reasons for the overall success rating	Waste Management and Sanitation (n=128)	Natural Resource Management (n=9)	Ecotourism (n=46)	Soil Erosion and Localized Flood Control (n=12)
The sub-project is just a waste of money	0.00	0.00	2.17	0.00
Unsustainable and no development plan, policy, and management	0.00	0.00	2.17	0.00
The facility in not well constructed	0.00	0.00	6.52	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**

The following discusses the specific rating provided by the key informants from different participating LGUs.

Case 1. Materials Recovery Facility

Ten (10) out of 12 key informants expressed their satisfaction with the implementation of MRF in their communities. In terms of the overall success, four key informants gave a rating of 4, considering that proper waste segregation is now being put into practice. However, there are still some improvements, which need to be done particularly in the transport of wastes, as well as logistics, and budgetary support. Two (2) key informants gave a rating of 5 because they believed that the project harnessed the cooperation of the community and the different stakeholders. However, two key informants gave a rating of 2 because the project did not generate income to the community, while one key informant gave a rating of 3, because the project was not functioning well.

Case 2. Agroforestry and Reforestation Projects

Both key informants were satisfied with the implementation of LISCOP sub-projects in their respective communities. In terms of the overall success in project implementation, the key informant from Tanay, Rizal gave a rating of 4 in their reforestation project, as there are still a lot of improvements that could be made such as the integration of goat as a project component. There is potential for goat production in the area considering the presence of the physical structure (which could house the goats). In terms of enhancing the environmental conservation efforts of the community, the LGU could institute a policy or ordinance such that tourists would be required to plant an indigenous tree species (one tourist to plant one tree species). Likewise, the key informant in Pangil, Laguna gave a rating of 4 to their agroforestry project as this component provides employment opportunities, while enhancing the environmental conditions. According to the key informant, active support and dedication of the people involved in the agroforestry project were necessary ingredients in project implementation.

Case 3. Soil Erosion and Local Flood Control Project

The key informants expressed their satisfaction on the LISCOP sub-projects in their communities. The key informant from Barangay Tandang Kutyo gave a rating of 5 in terms of the overall success of LISCOP sub-project in their community. The rating was based on the 90% reduction in flooding incidences in their community, which was attributed to the construction of ripraps. He suggested that the other side of the community, where Kaybuli Creek is found, also needs riprapping to achieve the overall goal of 100% secure in so far as risk to flooding is concerned. Meanwhile, the other key informant gave a rating of 4 in terms of the overall success of the drainage system project in their community. He argued that there are still a lot of developments to do such as the expansion of the outlet/mouth of the drainage or to add more of such facility in strategic areas within the barangay which happen to be the catch basin of water of three barangays in the municipality of Tanay, Rizal.

Case 4. Ecotourism Projects

Because of the environmental, economic and social contributions of the ecotourism sub-projects to the implementing communities, the five key informants expressed that they were satisfied with the LISCOP sub-projects. As such, two key informants gave an overall rating of 5 as the establishment of the eco-park offered tourism potentials for their community, and created employment; two informants gave a rating of 4, as there may still be some improvements which need to be done for an efficient management of the ecotourism sites; and one gave a rating of 3. Meanwhile, the key informant from Majayjay, Laguna stressed that the income generated from the entrance fee of P30/person overnight and P20/person whole day should be distributed as follows: 50% for the barangay; 25% for the municipal LGU; and 25% for the PAMB-DENR. As such, the barangay LGU should maintain the cleanliness within the vicinity, provide lifeguard and roving *tanod*, collect fees, and assign an officer of the day.

11.0 SUMMARY AND CONCLUSION

Impact evaluation of the LISCOP project is an assessment of how the intervention being evaluated affected outcomes, whether these outcomes are intended or unintended. Impact is defined as the attainment of development goals of the project or programs or rather the contribution to their attainment. This project impact evaluation established whether the project intervention has a welfare effect on individuals, households, and communities, and whether this effect can be attributed to the concerned intervention.

Secondary data were used to carry out the whole impact study. In evaluating the impacts of sector-wide sub-projects (e.g., waste management, natural resources management, ecotourism and localized flood control), secondary data were used to buttress other data. Moreover, qualitative data from key informant interviews and focus group discussions were generated. Furthermore, household interviews were undertaken.

Five (5) major objectives were set to measure the impact of the LISCOP project: a) identify and assess if there was a decrease in the negative environmental impacts, b) assess if there was an increase in the participation and involvement of communities and other stakeholders in watershed planning and management; c) assess if there was an improved environmental compliance of regulated establishments; d) assess the transformation of LLDA as an apex organization for integrated lake basin management; and e) identify other benefits and gains (both planned and unplanned) and impacts (intended and unintended) of the project to the beneficiaries.

On a scale of 0 to 5 with five being the highest, more than 89% of the direct beneficiaries indicated that the LISCOP project, through its sub-projects, was able to address environmental concerns in their localities. In particular, promotion of waste segregation, proper garbage collection, problem on deforestation, problem of flooding, landslides, and soil erosion were addressed in their respective areas.

Participation and involvement of communities and other stakeholders have increased (i.e., 76% direct beneficiaries and 60% community members) in watershed planning and management activities. These watershed management activities were of four major project categories: a) waste management and sanitation, b) natural resources management, c) eco-tourism, and d) soil erosion and flood control projects. Awareness of the community could have facilitated the adoption of these sub-projects. As a result, compliance in regulations and policies concerning the implementation of the project were adhered to by the respondents.

In terms of improved environmental compliance of regulated establishments, the investigation showed that all indicators of performance measure were achieved. Target compliance by enterprises improved from 30% in year 2010 to 92% three years after when compared with the baseline.

Impact evaluation of LISCOP sub-projects were designed primarily to address the environmental issues and problems of the concerned municipalities and communities. These aspects have likewise provided social and economic contributions to the participating communities. As seen from the results, more than half (58%) of the community members surveyed indicated socio-economic contributions of the LISCOP sub-projects. In particular, increase in income brought about by the direct employment of some households and other related economic and livelihood activities were experienced by the respondents.

In relation to overall human being as measured in terms of social interaction, conflicts within the community brought about by the projects, and the security and health risks, the respondents claimed that LISCOP enhanced their social interaction and unity through their engagement in the project itself. Their day-to-day interaction, communication and bonding have resulted in complying with policies particularly in waste segregation activities. Concomitant to this, the respondents did not see any conflict or risk associated with the implementation of the LISCOP project. With the scale of 0 to 5 with the highest defining the presence of danger, the responses were the same that the sub-projects were implemented safely and did not pose any danger to the community.

From the point of view of institutional and management of LISCOP project and sub-projects, the investigation indicated that LLDA can still be able to function effectively in dispensing its mandate of management and promotion of institutional arrangements through coordination and planning at a basin level. The following characteristics were found to be effectively present in their mandate: a) a clear goal of nurturing the development of sustainable management provider; b) politically independent, with a strong board to protect the institution from political intervention, thus ensuring that management can make decisions on technical grounds; c) continuously receives funding from foreign governments which clearly indicates its ability and experience to handle fiscal management, monitor, and evaluate projects according to institutional performance targets; and d) equipped with high quality personnel with a blend of lake basin expertise, managerial, and fiscal skills, and integrity.

Economic measurement of impacts of selected LISCOP sub-projects was based on computing and approximating the beneficiaries' situation with the project to control situations where there was no action or without the project itself. Over a period of five years (2014-2018), provisioning services in the form of incremental benefits were quantified and valued based on data records provided for in the original feasibility studies available. In most cases where vital records were missing, alternative values were provided taken from areas or sub-project sites approximating similar site or ecosystem characteristics. Results of economic analysis for completed LISCOP sub-projects generated an economic internal rate of return (EIRR) of 12%. The low 12% may have been due to some intangible benefits of the sub-projects. For instance, creation of new job opportunities, better health care as a result of more income received by the family and community, better nutrition, reduced incidence of diseases as a result of improved or better waste management, less flooding, etc. Such intangible benefits are real and reflect true values. They do not, however, lend themselves to valuation. However, best effort were made to provide an objective assessment of these intangible benefits and quantified in order to proceed with the analysis.

Lessons learned and best practices were extracted from interviews, survey, and consultations from concerned stakeholders, and analyses of records and secondary data of LISCOP sub-projects implemented in various concerned municipalities. Identified best practices were aligned with the stated objectives of this impact evaluation study, which included: participatory approach and constant consultations with concerned stakeholders, engaging stakeholders in all aspects of project preparation and implementation and effective institutional framework and linkaging.

Policy recommendations aimed at establishing pathways to sustainable management of the environment for social and economic development and growth. These policies were gathered and assessed based on reviews and assessment of records, survey, and responses from concerned stakeholders and project managers and implementers. For consistency, these policies were aligned based on the established objectives of this impact evaluation study. To address a reduction (decrease in the negative impacts on the

environment, such policy must be on: integrating ecosystem services and adaptive management; for increased participation and involvement of stakeholders: education and outreach program, incentive-based programs, formulation and implementation of solid waste operations; on improved compliance of regulated establishments: modify or change codes, i.e. to require commercial development to provide space and access for recycling; and with reference to institution strengthening: fostering good governance, transparency and accountability, innovation and technology transfer, and sustained project management and capacity building.

With all these impact investigations and findings, however, the study had some limitations. In the course of doing the survey, the respondents may have provided choices that were made about the aspects being assessed in relation to a particular sub-project of LISCOP project and would differ depending on the kind of involvement and the position they occupied during the sub-project's implementation and execution. In particular, impact evaluation is not only about assessing the effects of the intervention (sub-project introduction) but also about underlying questions of what types of processes of change and effects are valued as important (positive or negative) by the respondents themselves. The reliability of information based on stakeholder perceptions would vary depending on their strategic responses (e.g. least resistance, cautious or dynamic), manipulation of information (e.g., truthful and correct without omission) or the kind of advocacy they believed in. The LISCOP project through its sub-projects addresses aspects that are assumed to be critical for effective development yet difficult to define and measure, such as human security, good governance, political will and capacity, sustainability and effective institutional systems. Impact evaluation study/survey has adopted queries to approximately capture these concerns through survey instruments (FGD, KII and household surveys) depending on the nature of the sub-project, stakeholders involvement, sites of interventions (project location and area coverage) and target groups. Having said that, it is impossible to have a conversation among them based on mutually understood and accepted data at present because of the absence of particular pieces of required information. Collection and gathering of secondary data oftentimes were incomplete and wanting in details. Essentially, this condition leads to the principle of truism that 'what gets measured gets valued', and that what is not, or cannot be measured were ignored.

Overall, the study proceeded with success despite its limitations. Data were collected and assembled in a transparent, rigorous fashion, and in accordance with the established sampling procedure free of any pre-determined bias to address the concerns that were intended to be addressed.

12.0 POLICY RECOMMENDATIONS

Theme: Pathways to sustainable management of the environment for social and economic development and growth

The project team identified policy areas which deserve particular attention and analyses which come from the impact evaluation of the LISCOP project. The aim is to come up with solid and inspiring policy recommendations and hopefully would contribute to the betterment of related future project evaluation and impact assessment.

On the basis of the objectives set for this impact evaluation study, the following policy recommendations are hereby endorsed, to wit:

- *Decrease in the negative environmental impacts*
    - *Integrating ecosystem services and adaptive management*
        - Valuation of localized ecosystem services;
        - Approaches in managing risks and building community resilience that account for inherent uncertainties.

- *Increase in the participation and involvement of communities and other stakeholders*

    - In partnership with allied waste, the municipality's waste hauler, educate residents and businesses on the cost effectiveness and environmental benefits of food scrap composting and recycling, and increase the number of business and residents that implement waste reduction.
        - Distribute information through existing venues (municipal or barangay news organs, social media (text messaging);
        - Create communication strategies to celebrate municipal /barangay success in waste reduction and diversion;
        - Support events that encourage waste prevention such as garage sale and junk yard sales.
    - Incentive-based programs
        - Create incentives and reduce barriers for residents and businesses to recycle and reuse materials;
        - Eliminate the use of non-biodegradable or non-recyclable disposable bags and "to go" containers.
    - Develop and implement solid waste operations
        - Dedicate a staff position for a sustainability coordinator to work with municipal and community efforts in waste reduction and other sustainability activities;
        - Review and evaluate all municipal and barangay waste receptacles to support diversion rate goals;
        - Establish mechanism for measuring and reporting progress in achieving 100% participation goal;
        - Work with allied waste to modify or change trash pick-up procedures to encourage efficient waste management;

- Make all public events waste-free;
- Implement food composting in all municipal and barangay buildings;
- Support efficient collection of waste stream by requiring the use of allied waste approved standard residential waste receptacles.

- *Improved environmental compliance of regulated establishments*

  - Code changes

    - Modify municipal and barangay land use codes to require commercial development to provide space and access for recycling and food scrap composting containers;
    - Analyze the use of disincentives for the use of plastic bags and styrofoam containers.

- *Institutional strengthening*

  - *Fostering good local governance, transparency and accountability*

    - Development of an inter-local cooperation for improved service delivery and to encourage local economic development;
    - Analyze potential for and benefits of a financing framework for LGU alliances projects including loan financing and shared revenue options;
    - Issuance of full disclosure policy of local budgets and finances, bids and public offerings;
    - Implementing capacity building activities for concerned elected LGU officials to assist their analytical capacity on understanding the LGU disclosed documents;
    - Piloting the “Citizen Satisfaction Index System” to generate feedback on the service performance and programs of the government.

  - *Innovation and technology transfer support structure for LGUs*

    - Digital repository of training modules, guides, tools, examples, models of LGU strategies, policies, best practices and case studies for the promotion of local innovation and technology transfer activities for LGU’s development and growth;
    - Consolidating a network of technology managers in universities and public institutions within the vicinity of target LGUs.

  - *Sustained project management and capacity building*

    - Focus on facilitation skills, resource mobilization, project monitoring and evaluation;
    - Decision-making process and iteration, risk and sensitivity analysis;
    - Report writing and documentation.

Table 18. Logical framework summary of the policy recommendations

Project Objectives	Policy Recommendations	Strategies/Activities	Responsible Agency(s)
Decrease/reduction in the negative impacts	Integrating ecosystem services and adaptive management	Valuation of localized ecosystem services	Concerned municipal units (MENRO/City Environment and Natural Resource Office (CENRO)
		Approaches in managing risks and building community resilience that accounts for inherent uncertainties	Concerned LGUs (Municipal Disaster Risk Reduction Office)
Increase in participation and involvement of communities and other stakeholders	In partnership with Allied Waste, the municipality's waste hauler, educate residents and businesses on the cost effectiveness and environmental benefits of food scrap composting and recycling, and increase the number of business and residents that implement waste reduction	Distribute information through existing venues (municipal or barangay news organs, social media (text messaging, etc.)	Concerned municipal and barangay units
		Create communication strategies to celebrate municipal/barangay success in waste reduction and diversion	Concerned municipal and barangay units
		Support events that encourage waste prevention such as garage sale, junk yard sales, etc.	Concerned municipal and barangay units
	Develop incentive-based programs	Create incentives and reduce barriers for residents and businesses to recycle and reuse materials	Concerned municipal and barangay units
		Eliminate the use of non-biodegradable or non-recyclable disposable bags and "to go" containers	Concerned municipal and barangay units
	Develop and implement solid waste operations	Dedicate a staff position for a sustainability coordinator to work with municipal and community efforts in waste reduction and other sustainability activities	Concerned municipal and barangay units
		Review and evaluate all municipal and barangay waste receptacles to support diversion rate goals	Concerned municipal and barangay units
		Establish mechanism for measuring and reporting progress in achieving 100% participation goal	Concerned municipal and barangay units

Project Objectives	Policy Recommendations	Strategies/Activities	Responsible Agency(s)
		Work with Allied Waste to modify or change trash pick-up procedures to encourage efficient waste management	Concerned municipal and barangay units
		Make all public events waste-free	Concerned municipal and barangay units
		Implement food composting in all municipal and barangay buildings;	Concerned municipal and barangay units
		Support efficient collection of waste stream by requiring the use of Allied Waste approved standard residential waste receptacles	Concerned municipal and barangay units
Improved environmental compliance of regulated establishments	Re-examine and initiate code changes, if necessary	Modify municipal and barangay land use codes to require commercial development to provide space and access for recycling and food scrap composting containers	DENR –Environmental Management Bureau (EMB)/ LLDA
		Analyze the use of disincentives for the use of plastic bags and styrofoam containers	DENR-EMB / LLDA
Institutional strengthening	Fostering good local governance, transparency and accountability	Development of an inter-local cooperation for improved service delivery and to encourage local economic development	Concerned municipal and barangay units
		Analyze potential for and benefits of a financing framework for LGU alliances projects including loan financing and shared revenue options	Concerned municipal and barangay units
		Issuance of full disclosure policy of local budgets and finances, bids and public offerings	Concerned municipal and barangay units
		Implementing capacity building activities for concerned elected LGU officials to assist their analytical capacity on understanding the LGU disclosed documents	Concerned municipal and barangay units

Project Objectives	Policy Recommendations	Strategies/Activities	Responsible Agency(s)
		Piloting the "Citizen Satisfaction Index System" to generate feedback on the service performance and programs of the government	Concerned municipal and barangay units
	Innovation and technology transfer support structure for LGUs	Digital repository of training modules, guides, tools, examples, models of LGU strategies, policies, best practices and case studies for the promotion of local innovation and technology transfer activities for LGU's development and growth	LLDA in cooperation with academe and research institutions within the locality
		Consolidating a network of technology managers in universities and public institutions within the vicinity of target LGUs;	LLDA in cooperation with academe and research institutions within the locality
	Sustained project management and capacity building	Focus on facilitation skills, resource mobilization, project monitoring and evaluation	LLDA in cooperation with concerned LGUs
		Decision-making process and iteration, risk and sensitivity analysis	LLDA in cooperation with concerned LGUs
		Report writing and documentation	LLDA in cooperation with concerned LGUs

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14.0 ANNEXES

Annex 1. Results of Cochran Test for environmental contribution of the LISCOP sub-projects

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.89	.311	0	1
Community	75	.75	.438	0	1
Control	75	.96	.197	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	67
Community	19	56
Control	3	72

Test Statistics	
N	75
Cochran's Q	14.889[a]
df	2
Asymp. Sig.	.001
a. 1 is treated as a success.	

ADDRESS: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.89	.311	0	1
Community	75	.75	.438	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	67
Community	19	56

Test Statistics	
N	75
Cochran's Q	5.261[a]
df	1
Asymp. Sig.	.022
a. 1 is treated as a success.	

ADDRESS: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.89	.311	0	1
Control	75	.96	.197	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	67
Control	3	72

Test Statistics	
N	75
Cochran's Q	5.261[a]
df	1
Asymp. Sig.	.022
a. 1 is treated as a success.	

ADDRESS: Control VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Control	100	.96	.197	0	1
Community	100	.77	.423	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Control	4	96
Community	23	77

Test Statistics	
N	100
Cochran's Q	15.696[a]
df	1
Asymp. Sig.	.000
a. 1 is treated as a success.	

Annex 2. Results of Cochran Test for consultation of both men and women of the community regarding the LISCOP sub-projects

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	47	.83	.380	0	1
Community	47	.60	.496	0	1
Control	47	.62	.491	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	39
Community	19	28
Control	18	29

Test Statistics	
N	47
Cochran's Q	8.222[a]
df	2
Asymp. Sig.	.016
a. 0 is treated as a success.	

Consulted: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	47	.83	.380	0	1
Community	47	.60	.496	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	39
Community	19	28

Test Statistics	
N	47
Cochran's Q	6.368[a]
df	1
Asymp. Sig.	.012
a. 0 is treated as a success.	

Consulted: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	47	.83	.380	0	1
Control	47	.62	.491	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	39
Control	18	29

Test Statistics	
N	47
Cochran's Q	6.250[a]
df	1
Asymp. Sig.	.012
a. 0 is treated as a success.	

Consulted: Control VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Control	100	.71	.456	0	1
Community	100	.65	.479	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Control	29	71
Community	35	65

Test Statistics	
N	100
Cochran's Q	.900[a]
df	1
Asymp. Sig.	.343
a. 0 is treated as a success.	

Annex 3. Results of Cochran Test for information about livelihood/employment of the LISCOP sub-projects

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	67	1.15	.359	1	2
Community	67	1.55	.501	1	2
Control	67	1.58	.497	1	2

Cochran Test

Frequencies		
	Value	
	1	2
Beneficiary	57	10
Community	30	37
Control	28	39

Test Statistics	
N	67
Cochran's Q	30.863[a]
df	2
Asymp. Sig.	.000
a. 1 is treated as a success.	

Informed: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	67	1.15	.359	1	2
Community	67	1.55	.501	1	2

Cochran Test

Frequencies		
	Value	
	1	2
Beneficiary	57	10
Community	30	37

Test Statistics	
N	67
Cochran's Q	22.091[a]
df	1
Asymp. Sig.	.000
a. 1 is treated as a success.	

Informed: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	70	1.16	.367	1	2
Control	70	1.57	.498	1	2

Cochran Test

Frequencies		
	Value	
	1	2
Beneficiary	59	11
Control	30	40

Test Statistics	
N	70
Cochran's Q	21.564[a]
df	1
Asymp. Sig.	.000
a. 1 is treated as a success.	

Informed: Control VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Control	92	1.50	.503	1	2
Community	92	1.50	.503	1	2

Cochran Test

Frequencies		
	Value	
	1	2
Control	46	46
Community	46	46

Test Statistics	
N	92
Cochran's Q	.000[a]
df	1
Asymp. Sig.	1.000
a. 1 is treated as a success.	

Annex 4. Results of Cochran Test for socio-economic contribution of the LISCOP sub-projects to the community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.89	.311	0	1
Community	75	.53	.502	0	1
Control	75	.87	.342	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	67
Community	35	40
Control	10	65

Test Statistics	
N	75
Cochran's Q	30.178[a]
df	2
Asymp. Sig.	.000
a. 1 is treated as a success.	

Socio-Economic: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.89	.311	0	1
Community	75	.53	.502	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	67
Community	35	40

Test Statistics	
N	75
Cochran's Q	18.692[a]
df	1
Asymp. Sig.	.000
a. 1 is treated as a success.	

Socio-Economic: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.89	.311	0	1
Control	75	.87	.342	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	8	67
Control	10	65

Test Statistics	
N	75
Cochran's Q	.250[a]
df	1
Asymp. Sig.	.617
a. 1 is treated as a success.	

Socio-Economic: Control VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Control	100	.88	.327	0	1
Community	100	.59	.494	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Control	12	88
Community	41	59

Test Statistics	
N	100
Cochran's Q	20.512[a]
df	1
Asymp. Sig.	.000
a. 1 is treated as a success.	

Annex 5. Results of Cochran Test for other economic or livelihood activities of the LISCOP sub-projects in the household

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.59	.496	0	1
Community	75	.37	.487	0	1
Control	75	.43	.498	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	31	44
Community	47	28
Control	43	32

Test Statistics	
N	75
Cochran's Q	6.933[a]
df	2
Asymp. Sig.	.031
a. 1 is treated as a success.	

LIVELIHOOD: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.59	.496	0	1
Community	75	.37	.487	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	31	44
Community	47	28

Test Statistics	
N	75
Cochran's Q	6.095[a]
df	1
Asymp. Sig.	.014
a. 1 is treated as a success.	

LIVELIHOOD: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.59	.496	0	1
Control	75	.43	.498	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	31	44
Control	43	32

Test Statistics	
N	75
Cochran's Q	3.600[a]
df	1
Asymp. Sig.	.058
a. 1 is treated as a success.	

LIVELIHOOD: Control VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Control	100	.42	.496	0	1
Community	100	.35	.479	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Control	58	42
Community	65	35

Test Statistics	
N	100
Cochran's Q	.961[a]
df	1
Asymp. Sig.	.327
a. 1 is treated as a success.	

Annex 6. Results of Cochran Test for the conflict among the members of the household in the implementation of LISCOP sub-projects

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.27	.445	0	1
Community	75	.23	.421	0	1
Control	75	.12	.327	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	55	20
Community	58	17
Control	66	9

Test Statistics	
N	75
Cochran's Q	6.258[a]
df	2
Asymp. Sig.	.044
a. 1 is treated as a success.	

CONFLICT: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.27	.445	0	1
Community	75	.23	.421	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	55	20
Community	58	17

Test Statistics	
N	75
Cochran's Q	.429[a]
df	1
Asymp. Sig.	.513
a. 1 is treated as a success.	

CONFLICT: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.27	.445	0	1
Control	75	.12	.327	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	55	20
Control	66	9

Test Statistics	
N	75
Cochran's Q	5.762[a]
df	1
Asymp. Sig.	.016
a. 1 is treated as a success.	

CONFLICT: Control VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Control	100	.14	.349	0	1
Community	100	.19	.394	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Control	86	14
Community	81	19

Test Statistics	
N	100
Cochran's Q	.926[a]
df	1
Asymp. Sig.	.336
a. 0 is treated as a success.	

Annex 7. Results of Cochran Test for the health and/or security risks involved in the household in the implementation of LISCOP sub-projects

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.31	.464	0	1
Community	75	.25	.438	0	1
Control	75	.16	.369	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	52	23
Community	56	19
Control	63	12

Test Statistics	
N	75
Cochran's Q	4.326[a]
df	2
Asymp. Sig.	.115
a. 0 is treated as a success.	

RISKS: Beneficiary VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.31	.464	0	1
Control	75	.16	.369	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	52	23
Control	63	12

Test Statistics	
N	75
Cochran's Q	4.172[a]
df	1
Asymp. Sig.	.041
a. 0 is treated as a success.	

RISKS: Beneficiary VS Community

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Beneficiary	75	.31	.464	0	1
Community	75	.25	.438	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Beneficiary	52	23
Community	56	19

Test Statistics	
N	75
Cochran's Q	.500[a]
df	1
Asymp. Sig.	.480
a. 0 is treated as a success.	

RISKS: Community VS Control

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Community	100	.25	.435	0	1
Control	100	.13	.338	0	1

Cochran Test

Frequencies		
	Value	
	0	1
Community	75	25
Control	87	13

Test Statistics	
N	100
Cochran's Q	4.800[a]
df	1
Asymp. Sig.	.028
a. 0 is treated as a success.	

Annex 8. Results of Ordinal Regression of the rating on specific issues in the implementation of the LISCOP project

Parameter Estimates								
		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[TypeofRespondent = 1]	33.469	9016.895	.000	1	.997	-17639.321	17706.258
Location	[AddressRate=1]	-1.721	1.178	2.135	1	.144	-4.030	.587
	[AddressRate=2]	-.229	.840	.075	1	.785	-1.875	1.416
	[AddressRate=3]	-.353	.452	.609	1	.435	-1.239	.533
	[AddressRate=4]	-.254	.400	.403	1	.526	-1.037	.529
	[AddressRate=5]	0[a]	.	.	0	.	.	.
	[SocioEconRate=1]	-1.962	.899	4.758	1	.029	-3.725	-.199
	[SocioEconRate=2]	-2.429	.920	6.977	1	.008	-4.232	-.627
	[SocioEconRate=3]	-1.317	.443	8.821	1	.003	-2.186	-.448
	[SocioEconRate=4]	-.771	.420	3.370	1	.066	-1.595	.052
	[SocioEconRate=5]	0[a]	.	.	0	.	.	.
	[HazardRateHousehold=0]	14.697	6375.912	.000	1	.998	-12481.862	12511.255
	[HazardRateHousehold=1]	15.589	6375.912	.000	1	.998	-12480.970	12512.147
	[HazardRateHousehold=2]	18.292	6375.912	.000	1	.998	-12478.267	12514.850
	[HazardRateHousehold=3]	16.191	6375.912	.000	1	.998	-12480.368	12512.749
	[HazardRateHousehold=4]	16.951	6375.912	.000	1	.998	-12479.607	12513.510
	[HazardRateHousehold=5]	0[a]	.	.	0	.	.	.
	[HazardRateCommunity=0]	19.398	6375.912	.000	1	.998	-12477.159	12515.955
	[HazardRateCommunity=1]	17.493	6375.911	.000	1	.998	-12479.064	12514.050
	[HazardRateCommunity=2]	15.750	6375.912	.000	1	.998	-12480.807	12512.308
	[HazardRateCommunity=3]	17.549	6375.912	.000	1	.998	-12479.008	12514.106

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
	[HazardRateCommunity=4]	17.607	6375.912	.000	1	.998	-12478.951	12514.164
	[HazardRateCommunity=5]	0[a]	.	.	0	.	.	.
	[Overallsuccessrating=1]	-17.707	4724.892	.000	1	.997	-9278.325	9242.911
	[Overallsuccessrating=2]	.370	.996	.138	1	.710	-1.581	2.322
	[Overallsuccessrating=3]	.442	.474	.867	1	.352	-.488	1.371
	[Overallsuccessrating=4]	.069	.419	.027	1	.870	-.752	.890
	[Overallsuccessrating=5]	0[a]	.	.	0	.	.	.
	[Overallimpactrate=0]	-16.995	.000	.	1	.	-16.995	-16.995
	[Overallimpactrate=1]	-.782	1.085	.519	1	.471	-2.909	1.345
	[Overallimpactrate=2]	.426	.907	.220	1	.639	-1.352	2.204
	[Overallimpactrate=3]	.271	.472	.330	1	.566	-.654	1.196
	[Overallimpactrate=4]	-.400	.470	.724	1	.395	-1.320	.521
	[Overallimpactrate=5]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Annex 9. Economic Internal Rate of Return of completed LISCOP sub-projects

Province	Municipality	Sub-project	Incremental Benefit (PhP) [1]					Total Incremental Benefit (PhP)	Loan and Equity	Add'l Financing	COST (PhP)					Net Benefits
			2014	2015	2016	2017	2018		Jan. 7, 2014	2014	2015	2016	2017	2018	Total Cost	
Laguna	Cavinti	Eco-tourism	8,189,256.00	8,789,503.00	9,409,557.00	10,050,072.00	10,711,725.00	47,150,113.00	6,498,354.00		6,739,443.30	6,989,476.64	7,248,786.23	7,517,716.20	28,495,422.36	18,654,691.00
	Liliw	MRF	1,841,417.49	1,841,417.49	1,841,417.49	2,025,559.24	2,025,559.24	9,575,371.00	2,520,975.00		2,614,503.45	2,711,501.53	2,812,098.24	2,916,427.08	11,054,530.30	-1,479,159.00
	Mabitac	MRF	3,069,000.00	3,587,000.00	4,049,000.00	4,118,000.00	4,818,000.00	19,641,000.00	2,500,000.00		2,592,750.00	2,688,941.03	2,788,700.74	2,892,161.53	10,962,553.30	8,678,447.00
	Majayjay	Eco-tourism	20,411,000.00	21,820,000.00	21,461,000.00	24,420,000.00	24,924,000.00	113,036,000.00	23,758,705.00		24,640,152.96	25,554,302.63	26,502,367.26	27,485,605.08	104,182,427.90	8,853,572.00
	Nagcarlan	MRF	1,989,690.71	2,089,059.96	2,195,611.61	2,385,172.77	2,523,059.00	11,182,594.00	1,471,016.00		1,525,590.89	1,582,190.31	1,640,889.57	1,701,766.57	6,450,437.33	4,732,157.00
		WWTF	832,184.22	845,904.30	989,404.03	1,006,487.62	1,024,194.73	4,698,175.00	1,471,016.00		1,525,590.69	1,582,190.11	1,640,889.36	1,701,766.36	6,450,436.52	-1,752,262.00
	Pakil	Eco-tourism	1,464,231.00	1,600,561.00	1,697,870.00	1,789,323.00	1,860,230.00	8,412,215.00	3,735,643.83		3,874,236.22	4,017,970.38	4,167,037.08	4,321,634.16	16,380,877.83	-7,968,663.00
	Pangil	MRF	4,492,000.00	4,785,000.00	5,077,000.00	5,261,000.00	5,500,943.00	25,115,943.00	6,781,907.40	2,044,141.00	9,493,089.45	9,493,089.45	9,845,283.07	10,210,543.07	39,042,005.05	-13,926,062.00
		Eco-tourism	13,058,000.00	16,160,000.00	17,434,000.00	18,266,000.00	22,442,000.00	87,360,000.00	6,781,907.40	1,631,749.00	9,049,530.35	9,049,530.35	9,385,267.92	9,733,461.36	37,217,789.97	50,142,210.00
	Siniloan	MRF	1,989,690.71	2,089,059.96	2,195,611.61	2,385,172.77	2,523,059.00	11,182,594.00	920,817.77		954,980.11	990,409.87	1,027,154.08	1,065,261.49	4,037,805.55	7,144,788.00
		Eco-tourism	1,265,319.02	1,315,931.78	1,368,569.05	1,423,311.81	1,480,244.28	6,853,376.00	920,817.77		954,980.11	990,409.87	1,027,154.08	1,065,261.49	4,037,805.55	2,815,570.00
	Sta. Cruz	MRF	3,992,000.00	4,085,000.00	4,177,000.00	4,261,000.00	4,336,000.00	20,851,000.00	6,739,131.78		6,989,153.57	7,248,451.17	7,517,368.71	7,796,263.08	29,551,236.52	-8,700,237.00
		WWTF	832,184.22	845,904.30	989,404.03	1,006,487.62	1,024,194.73	4,698,175.00	6,739,131.78		6,989,153.57	7,248,451.17	7,517,368.71	7,796,263.08	29,551,236.52	-24,853,062.00
Rizal	Angono	MRF	14,967,631.00	15,051,715.00	15,835,303.00	16,914,242.00	17,847,000.00	80,615,891.00	4,275,359.12		4,433,974.94	4,598,475.41	4,769,078.85	4,946,011.68	18,747,540.89	61,868,350.00
	Antipolo	MRF	12,086,335.63	13,838,673.22	14,123,157.84	15,990,733.25	17,847,000.00	73,885,900.00	11,895,944.16		12,337,283.69	12,794,996.91	13,269,691.30	13,761,996.85	52,163,968.75	21,721,931.00
	Morong	MRF	7,411,833.00	7,782,425.00	8,171,546.00	8,680,123.00	9,009,129.00	41,055,056.00	5,821,535.00		6,037,513.74	6,261,505.50	6,493,807.36	6,734,727.61	25,527,554.20	15,527,502.00
	Tanay	MRF	2,992,000.00	3,085,000.00	3,177,000.00	3,461,000.00	3,863,160.00	16,578,160.00	3,632,449.39		3,767,213.26	3,906,976.87	4,051,925.72	4,202,252.16	15,928,368.01	649,792.00
		Eco-tourism	3,324,426.00	3,491,244.00	3,873,945.00	3,959,402.00	4,346,000.00	18,995,017.00	3,632,449.39		3,767,213.26	3,906,976.87	4,051,925.72	4,202,252.16	15,928,368.01	3,066,649.00
		Local Flood Control	3,464,000.00	3,637,000.00	3,819,000.00	4,010,000.00	5,794,660.00	20,724,660.00	3,632,449.39		3,767,213.26	3,906,976.87	4,051,925.72	4,202,252.16	15,928,368.01	4,796,292.00
	Taytay	Flood Control	6,411,833.00	6,782,425.00	7,171,546.00	7,680,123.00	8,052,000.00	36,097,927.00	7,998,834.19		8,295,590.94	8,603,357.36	8,922,541.92	9,253,568.23	35,075,058.45	1,022,869.00
	Teresa	MRF	6,511,833.00	6,982,425.00	7,971,546.00	8,680,123.00	8,874,987.00	39,020,914.00	7,313,983.28	5,994,845.00	14,314,661.74	14,314,661.74	14,845,735.69	15,396,512.49	58,871,571.67	-19,850,658.00
Quezon	Lucban	MRF	1,989,690.71	2,089,059.96	2,195,611.61	2,385,172.77	2,523,059.00	11,182,594.00	5,790,974.78		6,005,819.94	6,228,635.86	6,459,718.26	6,699,373.80	25,393,547.87	-14,210,954.00
		WWTF	832,184.22	845,904.30	989,404.03	1,006,487.62	1,024,194.73	4,698,175.00	5,790,974.78		6,005,819.94	6,228,635.86	6,459,718.26	6,699,373.80	25,393,547.87	-20,695,373.00
Cavite	GMA	Cluster MRF	15,469,000.00	16,394,000.00	17,369,000.00	18,102,000.00	19,197,000.00	86,531,000.00	11,571,149.92		12,000,439.58	12,445,655.89	12,907,389.72	13,386,253.88	50,739,739.08	35,791,260.00
																EIRR = 12%

Incremental Benefit: difference between with and without the project extracted from the original FS with adjustments made using hedonic, reversal and better transfer techniques