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Low Carbon Agricultural Support Project
Loan No. 2968-VIE (SF)
Contract No. 12112015/HDTV01-LCASP

ANNUAL REPORT 2018

Hanoi, 25/1/2019

Prepared for
Central Project Management Unit
Ministry of Agriculture and Rural Development
by
Agrifood Consulting International

in association with

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Smart Policies and Practices for Shared Prosperity

Agrifood Consulting International

11 June 2019

Dr. Nguyen The Hinh,
Project Director,
Low Carbon Agricultural Support Project,
Floor 8th, Building No. 2, 16 Thuy Khue,
Tay Ho, Ha Noi, Viet Nam

Reference: LCASP/2019/06/11/01

Subject: Submission of Quarter Report Q4-2018 and Annual Report 2018

Dear Sir,

Agrifood Consulting International Inc. and our associated firm, Asia Development Consultant Joint Stock Company are pleased to submit **Quarterly Report Q4-2018 and Annual Report 2018** for your feedback.

Please let us know if you need our further clarification.

Yours Sincerely,

Francesco Goletti

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Francesco Goletti
President/CEO
Agrifood Consulting International Inc.

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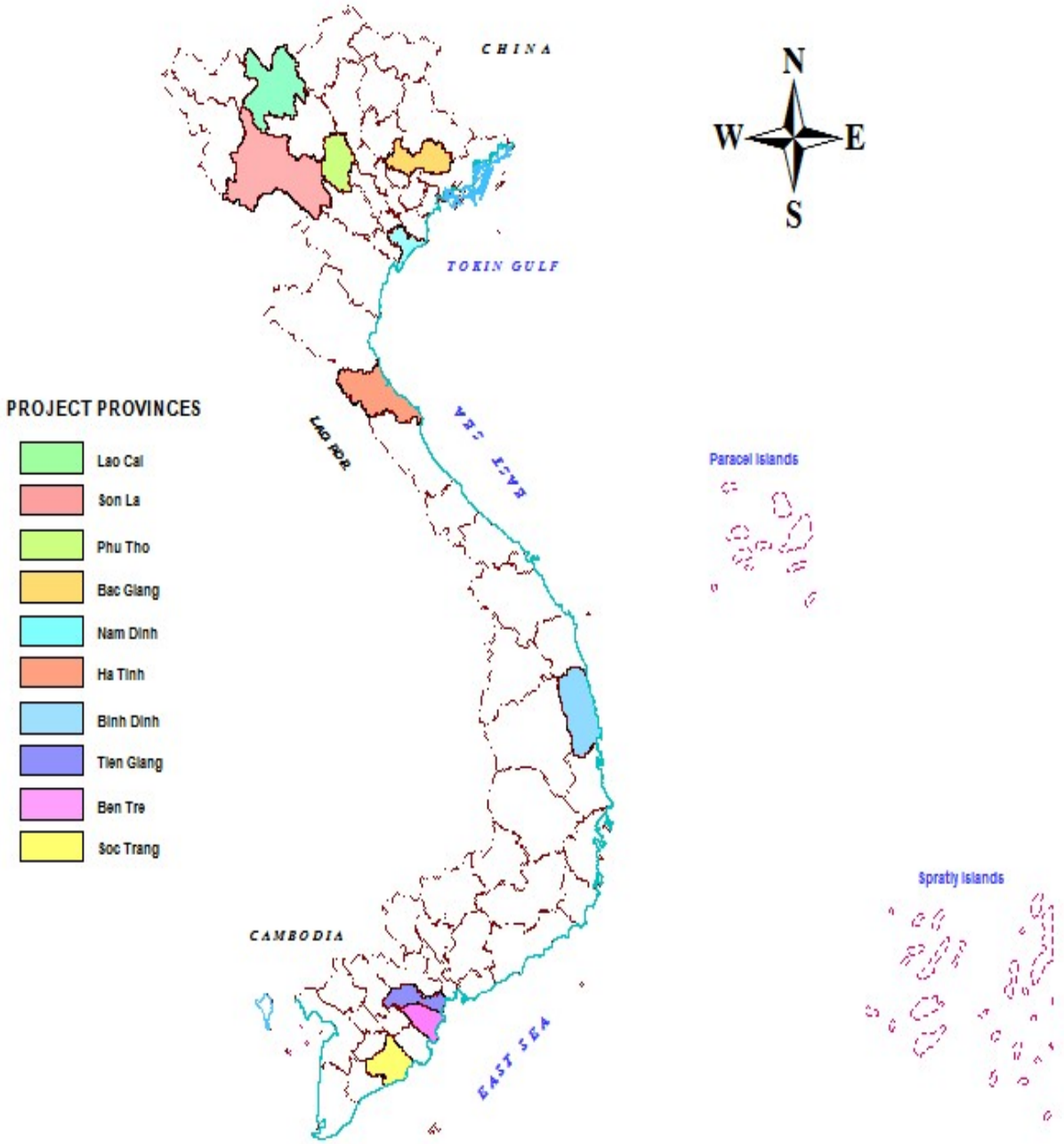
Project Map


CHINA
N
W
E
S
TOKIN GULF
PROJECT PROVINCES
Lao Cai
Son La
Phu Tho
Bac Giang
Nam Dinh
Ha Tinh
Binh Dinh
Tien Giang
Ben Tre
Soc Trang
LAO POR
EAST SEA
Paracel Islands
Spratly Islands
CAMBODIA
EAST SEA

ABBREVIATIONS

ACI	Agrifood Consulting International
ADB	Asian Development Bank
AD Consult	Asia Development Consultants JSC
BVC	Biogas Value Chain
CDM	Clean Development Mechanism
CPMU	Central Project Management Unit
CSAWMP	Climate Smart Agricultural Waste Management Practices
DoSTE	Department of Science, technology and Environment
DMF	Design and Monitoring Framework
EMR	Environmental Monitoring Report
GHG	Greenhouse Gas
GoV	Government of Viet Nam
HDPE	High Density Polyethylene
IEE	Initial Environmental Examination
ICT	Information and Communications Technology
INGO	International Non-governmental Organization
LCASP	Low Carbon Agriculture Support Project
LIC	Loan Implementation Consultancy
MBP	Medium Biogas Plants
MARD	Ministry of Agriculture and Rural Development
MOU	Memorandum of Understanding
MTR	Mid Term Review
PC	Provincial Coordinators
PPMU	Provincial Project Management Unit
ppm	Parts per million
REA	Rapid Environmental Assessment
SBP	Small Biogas Plants
SNV	Netherlands Development Organization
TA	Technical Assistance
TNA	Training Needs Assessment
TOR	Terms of Reference
US$	United States $
VND	Viet Nam Dong

1. INTRODUCTION

With the experience gained in the 2 two year project implementation of LIC (2016 & 2017) and based on the annual work plan, 2017, the LIC team provided technical support to CPMU and PPMUs with technical interventions and addressed technical issues. Innovative technical designs were in place especially the solutions on biogas overloading. Technical activities are covered under section main features of the technical assistance. There are altogether eight chapters in the report.

Basically, the report summarizes overall technical assistance in the year as reported in the quarterly reports.

LIC's technical assistance in 2018 mainly focused on supporting provincial project management units in the construction of biogas tanks; proposing solutions for avoiding biogas overload; implementation of demonstration models as well as support for research packages to complete explanations and reports on technology review.

The Environmental Assessment Report, gender and ethnic minority reports for the first 6 months of 2018 and the end of 2018 were prepared and sent to CPMU and ADB.

The above contents have been updated in each expert's report as well as LIC's quarterly reports.

2. BASIC INFORMATION OF THE PROJECT

Although biogas plant technology is known to Viet Nam for quite some time, the current needs for environmental mitigation measures including the reduction of GHG emission require the adoption of improved technologies and measures to minimize animal waste and effective climate smart agriculture waste management practices (CSAWMP). The new technologies and practices are important for all stakeholders in the project. Consequently, LCASP activities are supported with various capacity building and communication programs to be implemented in central, provincial, district and commune levels.
The Project is expected to increase the uptake of CSAWMP as measured by the increased use of clean biogas energy and organic bio-organic fertilizers.

The objectives of the project include:

(i) Improve management of animal waste and bio-slurry while reducing environmental pollution; creating clean energy; bio-organic fertilizer; generating incomes from Clean Development Mechanism (CDM).

(ii) Increasing the application of CSAWMPs that are effectively certified; greater use of renewable energy and bio-fertilizer from agricultural waste; replicating models in order to reduce greenhouse gas (GHG) emissions and improving the livelihoods and quality of life of rural people.

(iii) Capacity building of stakeholders and disseminating knowledge and skills of good CSAWMP to beneficiaries.

Expected Outcome:

The Design and Monitoring Framework (DMF) of the Project indicated that by 2018 (from baselines in 2013) the envisaged outcomes in the project areas include:

- At least 70% bio-slurry is converted to organic fertilizers.
- At least 80% energy produced by Biogas Value Chains (BVCs) is utilized
- Daily workload of women and children is reduced by 1.8–2 hours, on average

The four components of the project are:

i) Expanded use of animal waste management infrastructure,
ii) Credit lines for biogas value chains,
iii) Enhanced CSAWMP technology transfer and
iv) Effective project management.

The project covers 10 provinces of Vietnam, which are Son La, Lao Cai, Phu Tho, Bac Giang, Nam Dinh, Ha Tinh, Binh Dinh, Tien Giang, Ben Tre and Soc Trang. The project is implemented for a period of six years from 2013 to June 2019. Based on the Mid-term Review (MTR) in September 2016, the project net loan amount is 67.92 million USD.

3. SUMMARY OF TECHNICAL ASSISTANCE ACTIVITIES

With the experience of 2017 and based on the work plan of 2018, LIC team is continued to be mobilized for support CPMU and PPMUs. The main technical achievements are summarized in this report because the detailed content has been presented in quarterly reports.

3.1 Expanded use of livestock waste management (Biogas) infrastructure)

LIC consultant team continued to support the construction and operation of small and medium-sized biogas tanks in the provinces and at the same time assists the provinces in guiding households to install biogas tanks safely. Under the support of the provincial consultants, PPMUs promptly addressed technical issues related to the construction, operation and maintenance of biodigesters in their provinces.

Provincial coordinators regularly and closely coordinated with provincial technicians to check and supervise biogas tanks built in the project. Typically, the provincial coordinators coordinated with PPMU Nam Dinh and Ben Tre to test 127 biodigesters, of which 78 bio tanks received a subsidy of VND 3 million and 47 ones received VND 5 million subsidy.

The consultant provided technical support to PPMU Ha Tinh, Son La, Bac Giang ... in selecting households to build medium-scale biogas plants (volume of 51-75 m3) and coordinated with CPMU to inspect and acceptance of 6 medium-scale biogas tanks with volume from 51-75 m3 in Bac Giang and Lao Cai provinces. Test results showed that these works have been built to meet the technical requirements of the project. During the inspection process, LIC consulted on measures to thoroughly use biogas; to encourage technical measures to thoroughly utilize waste water after biogas for fruit trees, tea trees, irrigate grasses, vegetables and fish ponds; and to propose technical measures in operation and maintenance of medium scale biogas tanks.

In order to assess the status of operation of biogas tanks, LIC team conducted assessments on the gas quality in some biogas tanks in Nam and Phu Tho. The results of gas quality measurement showed that 16.7% of the works were not enough to use gas, 83.3% of the works were in overloaded state of loaded materials. However, the high methane content showed that the construction and installation quality is quite good, so it could ensure anaerobic environment for methane-producing bacteria.

LIC collaborated with CPMU to build a pre-acceptance test form for medium-scale biogas tanks and works construction evaluation criteria for after the works construction and installation of equipment completed. The form was approved by CPMU and issued for use throughout the project.

LIC has compiled (i) guidelines for construction of MBPs and recommended measures to thoroughly utilize biogas (used for cooking food and animal feed, sharing with other surrounding households, using biogas infrared heating lamps for young livestocks...); (ii) compilation of guidelines for technical issues in installation of generator systems in farm households with SBPs and proposing a reasonable installation model to ensure a sustainable system (H_2S filter must be installed before all biogas consumption devices and gas bags; the systems must have safety equipment, etc.). In addition, the consultant has reviewed and commented on the training materials on the use of the manure separators and generators of the Contractors and supported the Contractors in carrying out the training activities on the operation and use these machines.

The Consultant wrote a presentation on "Solutions to overcome overload of biogas plants" for the training of the LCASP. The document stated the causes of the overload of biogas

plants, and proposed solutions to overcome the overload for the biogas plants at farm households. Besides, the Consultant also proposed mechanisms and policies to encourage the application of biogas technology at household scale in treating livestock waste, contributing to reducing GHG emission.

The consultant cooperated with Son La PPMU to organize and provide lectures in training courses for biogas value chain technicians for more than 20 trainees in Son La province.

The consultant continued to support provinces such as Tien Giang, Son La and Ha Tinh to build models using bioslurry from biogas plants as fertilizers for crops, effectively using biogas sources for cooking and lighting.

The provincial coordinators supported and worked with the PPMUs to develop proposals for the application of livestock waste and residues from biodigesters as organic fertilizers for crops and environmental protection, specifically 03 models in Ben Tre, 03 models in Nam Dinh, 02 models in Ha Tinh, etc.

3.2 Technical solutions against overload for BP

The consultant continues to support PPMUs in building models to overcome the overloading SBPs in farm households. The anti-overload design solution regulates the amount of waste water discharged and filtered to obtain solid waste from biogas slurry; Solutions for making compost from surplus fertilizer as organic fertilizer in order to optimize the use for SBPs and propose an effective model of operating models.

In order to encourage households to utilize the surplus biogas amount, LIC has reviewed and studied documents on using biogas generators to consider the possibility of applying to Vietnam and completing the report "Overview of the use of generators in the world, problems and solutions ". The report consists of two main contents: (i) content related to technical issues such as types of engines, fuel consumption and performance, etc. and (ii) economic-related content and support policies. The report is posted on the project website as a reference and dissemination of knowledge to the project participants.

LIC coordinated with the provinces to support and advise on the design and construction of settling tanks before or after biodigesters to collect animal waste according to the number of livestock. This design helps farmers make use of wastewater after biodigesters to irrigate a variety of crops such as tea, grass, grapefruit and other fruit trees.

LIC continues to support research and calculation of excess gas amount and propose design and operation solutions to reduce the excess gas for some households who need to build tanks with a capacity of 20m^3 or more.

3.3 Using biogas for electricity generation and other purposes

LIC has provided technical advices on the installation, maintenance and use of biogas generators to households who will install biogas generators in Lao Cai (how to install and use biogas bags with large volumes (10-15m^3), use and replace H_2S filter in the filters, water traps, safety equipment, etc.).

In order to encourage households to use biogas generators, LIC has completed the report "Overview of the use of generators in the world, problems and solutions". The report is composed of two main contents: (i) content related to technical issues such as types of engines, fuel consumption and performance, etc. and (ii) economic-related content and support policies.

The consultant has compiled guidelines on technical issues in installation of generator systems in small-scale farm households and proposed a suitable installation model to ensure a sustainable system (H_2S air filter must be installed before all biogas consumption equipment and gas bag; the system must have safety equipment, etc.).

3.4 Low carbon agricultural research

The project has provided technical assistance to five research packages, including need assessment and research objectives; develop explanations and review technology review reports.

Regarding the comments on the research explanations, the Consultant reviewed the explanations that the packages developed and made some specific comments as follows:

- Research package No. 25: (i) Improving the composting technology from animal waste to make full use of agricultural byproducts like rice straw, old corn stalks, rice husks, etc. to increase economic efficiency for organic fertilizer making process; (ii) Study simple methods to dry residues (similar to sludge) into materials that can be easily processed into organic fertilizers; (iii) Study methods of using bioslurry after biodigesters as a liquid organic fertilizer, or as a raw material for making organic fertilizer.
- Research package No. 26: (i) For small-scale biogas technology, it is necessary to improve the slurry collecting section from the biodigester, to easily remove the slurry monthly; Improving the stirrers to increase fermentation efficiency. (ii) For

MBPs and LBPs, it is necessary to improve the scum breakers, the slurry collecting sections in the digesters. (iii) For the use of biogas in the value chain, it is necessary to improve the system of generators (biogas bags, generator cooling systems, power supply systems, etc.), to improve usage efficiency of biogas and generators.

- Research package No. 27: (i) It is necessary to assess the actual amount of water used for cleaning barns and livestock in 3 regions of the country (North, Central and South) by installing water meters. (ii) Research on using high-pressure pumps to "wash" the barns to reduce the amount of waste water. (iii) Research on the types of barn to collect waste without using water.
- Research package 28: Contractor needs to clarify the advantages and disadvantages of the technologies mentioned in the TOR to propose technology better suited to the actual conditions. The straw was no longer burned and discarded as in the 2013 survey (basis for development of the TOR), hence it may be necessary to investigate additional straw value chain in some project provinces if needed to propose changing of the locations. Regarding mushroom cultivation technology, it is necessary to propose the mushroom variety with the highest ability to convert straw; The most advanced cultivation technology to increase the straw value chain and at the same time forcasting the mushroom market to ensure that the use of straw for mushroom cultivation is more profitable than for other purposes.
- Reseach package No. 29: The contractor understands the requirements stated in the TOR, however, the contractor should add some information such as: i) It is recommended to analyze the physio-chemical composition of the sludge from the shrimp ponds as the basis for proposing a treatment plan or produce bio-organic fertilizer, or for other purposes (especially organic and salt contents, etc.); (ii) it is expected to create a group of bacteria to treat nitrogen (inorganic and organic) into protein and collect suspended substances into granule feed for whiteleg shrimp, so it is necessary to describe the technology/technological origin of this proposal.

For the technology review reports, the Consultant has reviewed the reports for several times and supported these 5 packages to finalize the technology review reports to meet the requirements. Details of the comments on the technology review reports of these 5 packages were attached in the quarterly reports of LIC.

LIC has supported Package 25 to develop proposals for making organic fertilizer from livestock waste in the value chain in Binh Dinh and making organic fertilizer from earthworm in Binh Dinh. These two proposals were presented by Package 25 at the workshop to solicit the opinion of the provincial departments to complete these proposals.

Based on the agreement between ADB and MARD, LIC has additionally designed 2 packages: Package No. 42: Piloting the production technology of mineral organic fertilizer used for key

crops from livestock waste and biogas byproducts in Vietnam, and Package No. 43: Building a production and supply system of micro-organism products that convert organic matters for treating livestock waste, waste after biogas and crop wastes in Vietnam to produce organic fertilizers. The above two packages have been submitted to ADB and APMB for review and approval.

3.5 Demonstration model: Manure Separators

The installation of manure separators in the provinces continues to be implemented during the year. Every month, the provincial coordinators regularly organize quality inspections and monitoring of the demonstration models. The results show that initially in some provinces, the installation of models has been effective such as in Bac Giang, Nam Dinh, Binh Dinh, Phu Tho, Son La, Soc Trang ... however there are still some models have not yet been effective because the products have no market or if it is, the price is very low.

In Son La, the Consultant checked 5 models of separators in the province. The results showed that (i) All 5 models of the separators performed well and compressed manure could be sold to market; (ii) The farms were satisfied with the quality as well as the consultancy provided by the contractors and provincial consultants. However, in order for these models to operate more effectively, the Consultant also proposed some following recommendations: (i) Some biogas plants are overloading with gas, the PPMU can advise these farms to install medium or large-scale generators to optimize the use of the generated biogas, avoiding direct discharge to the environment; (ii) The contractor shall accelerate the organization of the final workshop so that the models can be replicated to livestock farms in the area and (iii) After the models come into operation, LIC coordinates together with the PPMU to evaluate the effectiveness of the model implementation.

LIC also sent a mission to evaluate the effectiveness of the model implementation in 4 provinces: Nam Dinh, Phu Tho, Binh Dinh and Soc Trang. The preliminary assessment results show that most households are satisfied with the quality of the model and this model has initially been effective for users.

In order to use the manure separator effectively, the Consultant has:

- Proposed methods to calculate volume of settling tank to be suitable to the scale of each farm and prepared documents to propose the overall design of "continuous" settling tank to collect sedimented waste for the separator model;

- Prepared a method for monitoring the capacity of the separator, which proposed: (i) Method for recording and monitoring the capacity of the separator; (ii) types of

samples to be collected to evaluate the quality of collected solid waste products to use as raw materials for organic fertilizer production and proposing a sampling method to ensure objectivity.

- Prepared a form to monitor and evaluate the effectiveness of separator models in the project provinces;
- Suggested the reason why it is necessary to combine the separator with the biodigester system.

3.6 Demonstration model: Generators

In 2018, the consultant conducted support, inspection and evaluation of some models of generators in the provinces. Results in some provinces are as follows:

- In Lao Cai: 15 households have been installed with biogas generators, including two phase generators with a capacity of 5 KVA, 20m^3 gas bags (made of PVC tarpaulins), H2S gas filters and meters to measure electricity consumption from the generators. The majority of the households reported that biogas generators were mainly used for pumping water to clean the livestock cages in the morning and in the afternoon (some households used electricity for domestic use like lighting, electric fans, refrigerators, televisions, etc.), however, the machines' capacity is low. Most of the households thought that the machines have just reached a capacity of 1 - 1.2 kW/hour. The higher the power consumption was, the weaker the machines became. This is an important issue that LIC recommended reviewing and requested the contractors to find out the cause and soon fix this problem.
- In Tien Giang: Tien Giang province has two models using generators that have been installed by the companies with the entire systems using biogas connected to the farms' electricity systems. The generators have been operated daily and delivered at peak hours to save money on households' electricity bills. Specifically, in the farm using generator of 40KVA, the generator system worked well and stable, one day operating from 4 hours to 5 hours (1 day operating 2 shifts, from 2 hours to 3 hours per shift) depending on the amount of biogas produced.

The consultant also proposed some solutions to increase the lifespan of the generators as follows:

- Install additional air-filter system before conveying gas into generator;
- Determine the position and distance of the airbag installation to match the farm's actual requirements;
- Determine the capacity of the generator in accordance with the amount of gas generated;
- It is recommended to install better air filter system;

- Instructions/manuals on how to use biogas generators should be re-compiled in Vietnamese and pasted on the machines to remind users;
- There should be a warning sign where the generator is placed so that people are careful when using electricity;
- Add gas meter to measure the amount of gas produced in the model for more accurate calculation of the generator's efficiency and effectiveness.

3.7 Capacity building and information dissemination

The provincial coordinator has cooperated with the PPMUs to organize a number of training courses during this period. Together with the technical advisory team, the provincial coordinators have actively supported the compilation of materials and training activities.

LIC worked with the CPMU to support selected agencies to speed up the preparation of 3 primary vocational training curricula to submit to the Ministry for approval.

LIC gave comments on the communication scripts of package 40, TV conference and prepared the content to participate in 5 reportages related to LCASP project on VTV1, VTV2 and VTC 16. The content of these reportages was posted on the project website.

The Consultant (i) prepared 2 training materials for Tien Giang province (1) Measures to utilize excess gas from SBPs and MBPs, (2) Measures to prevent overload of SBPs and (ii) developed lectures with 9 contents for the training courses for biogas value chain technicians in Son La.

The Consultant prepared lectures on the use of separated dry waste collected from manure pressing machines to produce organic fertilizers - training materials for the manure pressing machine model and lectures on prevention of overloading of biodigesters and efficient use of gas.

In order to assess the impact of the training courses, the Consultant developed a questionnaire to assessment the impact of training for researchers. The Consultant has conducted 3 review missions in 3 project provinces of Son La, Bac Giang and Phu Tho.

LIC continue to coordinate with CPMU to monitor and promote the selection of the agency to prepare the curriculum and the progress of the vocational training program preparation.

3.8 Environmental safeguard policy

The technical team cooperated with the CPMU and PPMUs participating in environmental monitoring of the MBPs in accordance with the criteria of environmental safeguard policy. The provincial consultants play an important role in supporting the PPMUs and guiding PPMUs' technical staff in environmental monitoring. Although the provinces have been provided with environmental monitoring equipment, they have not used the equipment to conduct environmental monitoring.

As of 2018, all 49 MBPs and 2 LBPs have been built. IEE reports have been prepared and submitted to the CPMU. The IEE reports assess the environmental impact during the preparation, construction, and operation of the MBPs, environmental monitoring plans (EMPs) and environmental mitigation measures along with characteristics of the locations.

In this quarter, there have been problems that occurred in the previous quarters such as: most of the structures do not have proper settling tank design to treat slurry after the biodigesters, waste water from the settling tanks has not met the QCVN 62-MT: 2016/ BTNMT. Although LIC specialists and experts on slurry treatment have proposed some designs to reduce the amount of suspended solids in wastewater after the biodigesters, these designs have not met the requirements and many husbandry households do not want to apply because of: lack of construction space, lack of funding and effectiveness of these settling tanks have not been tested.

Two six-month environmental monitoring reports (January - June 2018 and July - December 2012) were prepared and CPMU sent them to ADB. These documents were posted on the ADB website.

3.9 Safeguard Policy on Gender and Ethnic Minorities

CPMU's gender database has been collected when the Gender Specialist was mobilized at the beginning of the year. The consultant supported PPMUs to collect and update the data, improve the capacity of PPMUs' staff, and update gender disaggregation data. EMDP and GAP was prepared to support CPMU. These updated documents have been posted on the ADB website.

LIC has collaborated with CPMU, PPMUs and contractors to integrate gender indicators into specific activities of the research and operations, and provide guidance to the provinces having the ethnic minorities (EMs) to develop EM indicators.

3.10 Policy and Institution

LIC has coordinated with CPMU to organize a workshop on "Solutions and policies for managing agricultural waste by value chain" in 2 days, 22 - 23/8/2018 in Binh Dinh. There were more than 70 delegates attending the workshop including representatives of relevant units of the MARD, 10 provinces participating in the LCASP project, associations/companies operating in the husbandry sector and other relevant agencies. LIC collected 47 articles of the agencies/organizations, research institutes, scientists.... All of these articles were compiled and printed in the workshop proceeding.

After listening to the reports on agricultural waste management policies of the international consultants, relevant agencies and the comments of the delegates, the Chief of the MARD Office issued Notice No. 7055/TB-BNN-VP dated 11th September 2018 to inform the conclusions of Deputy Minister Le Quoc Doanh at the workshop on "policy for managing agricultural waste by value chain".

3.11 Other technical assistance

LIC has effectively cooperated with relevant stakeholders to implement the project. In addition to the CPMU and PPMUs, LIC has worked with companies that supply manure separators and generators and units conducting research packages to assist them in completing the work related to the installation of these devices as well as reviewing and providing comments for these contractors to complete training materials.

LIC sent a team of specialists to participate in the mid-term review mission of ADB in 2 periods of 2018. The results of the missions were attached in reports of Quarter II and Quarter III of 2018.

4. TECHNICAL ASSISTANCE PROGRESS BY COMPONENTS

The quarterly technical assistance progress has been included in the detailed report of the Quarterly Reports.

5. PROJECT MANAGEMENT

ADB Missions

In March and August 2017, ADB conducted project review and the LIC team provided adequate support in the field visits and prepared reports. The consultant also commented on the reports of the missions.

Progress reports

All the specialists prepared quarterly and annual reports according to the form of ACI/AD Consult. The reports were approved by the APMB after meeting for acceptance. The reports were commended by the specialists before finalizing to submit to ACI/AD Consult, both in English and in Vietnamese.

The monthly work plan of the specialists for the following month was prepared one week before the start of the month so that the CPMU can review and comment. Monthly reports were also provided in the first week of the month.

The technical reports were prepared with the in-depth expertise and reported in the quarterly reports.

Coordination

LIC effectively coordinated with the CPMU, PPMUs, research institutes, contractors, INGO and other organizations. Provincial specialists and consultants provided timely support to handle technical issues. At the end of the year, the CPMU requested the consultant to provide weekly reports and the LIC team coordinated this regularly.

Stakeholder meetings

Four meetings on report acceptance and a quality assessment meeting for LIC's performance were held with APMB. Two 6-month review meetings were organized by CPMU and LIC (January and September 2017). The LIC team also organized internal meetings every two weeks and provided meeting minutes accordingly.

Regular support of ACI / AD Consult

LIC held a workshop to review 2017 and plan for 2018 in Moc Chau, Son La province on 15th January 2018. At this workshop, the central consultants and provincial specialists talked about related technical issues: i) solutions to overcome the overload of biogas plants; ii) issues related to gender and ethnic minorities, particularly the gender and ethnic minority mainstreaming in some provinces; iii) evaluation on the effectiveness of the package implementation as a basis for developing mechanisms and policies; iv) updating the progress as well as the existing issues related to the package implementation for the installation of separators and construction of MBPs in 4 provinces: Ben Tre, Bac Giang, Binh Dinh and Phu Tho, Lao Cai. The workshop minutes and work plan of 2018 are attached in Appendix 1.

The two companies provided timely support for the management of LIC team. LIC's work is done in a transparent and effective way.

In order to have a basis for requesting the contract extension, LIC completed the project implementation report and proposed to extend the project until the end of June 2019. The report on the need for project extension is attached in Appendix 2 of this report.

6. SPECIALIST MOBILIZATION

In the past year, the time of specialist mobilization reduced significantly because of the request of CPMU. ADB agreed to allow the CPMU to extend the project until June 2019, however, the contract signed between LIC and the CPMU will expire on 30th November 2018, so LIC requested to consider extending the contract to carry out the project's activities. Hence, from the first quarter of 2018, LIC has calculated the number of remaining working days of the consultants to be allocated until June 2018 to suit the time of project implementation. However, until now, after 6 months, LIC has issued an official letter requesting the contract extension but has not yet been approved by CPMU.

The total number of man-months in 2018 is 75.97 man-months, of which the average working time in the office is 30.82 man-months and the average time of field work is 45.15 man-months.

Table 1: Specialist Inputs by office and field work in 2018

Full name	Man-months by office work	Man-months by field work
Manohar Shrestha		0.73
Bùi Bá Bổng		0.37
Henrik B. Moller		0.45
Nguyễn Văn Bộ	5.10	1.33
Lê Thị Thoa	2.14	0.32
Bùi Văn Chính	7.57	1.83
Phạm Thị Vượng	7.96	1.69
Phạm Văn Bình	1.68	0.77
Tạ Hòa Bình	2.09	0.90
Lê Thị Mộng Phượng	0.00	0.00
Nguyễn Ngọc Long	4.28	1.1
Bùi Thế Hùng		3.78
Bùi Thị Phương Loan		2.73
Lê Ngọc Hùng		3.32
Đặng Thị Phương Lan		2.72
Tống Khiêm		4.64
Nguyễn Đình Vinh		5.32
Đào Văn Thông		2.37
Bùi Thị Lan Hương		3.46
Trần Việt Cường		1.78
Dư Văn Châu		5.54
Total	**30.82**	**45.15**

7. OVERALL ASSESSMENT ON THE PERFORMANCE OF THE TECHNICAL ASSISTANCE

The prevailing situation in households with biogas plants is that the scale of biogas tanks is not suitable for the amount of livestock waste to be treated, so LIC continued to support the design of solutions to prevent the overload of SBPs and MBPs in some project provinces by (i) adding a two-compartment settling tank to the biodigesters and by natural sedimentation process, separating solid waste from livestock wastewater to make organic fertilizers and (ii) separating solid waste from all tanks after biodigesters, using the collected solid to make organic fertilizers. The initial assessment results show that the prevention of the biogas tank overload in Phu Tho has been effective.

The separators have continued to be installed in the provinces and many technical issues were supported by LIC, particularly providing comments to complete the design of settling tanks to collect slurry for the separators, application of waste collecting systems and settling tanks for highly effective separators. These comments have been accepted by CPMU and the contractors and based on these comments, the contractors have revised the design of the settling tanks.

As the price of pig drop, the number of pigs in farms has reduced significantly compared to the previous capacity. This situation has affected the implementation of the generator models in some provinces due to insufficient amount of gas to operate the generators. LIC has assisted the PPMUs and the contractors to evaluate the locations where generators will be installed and capacity in Lao Cai, Bac Giang and Ben Tre. Some ineffective initial selected locations were replaced by new locations that received high concensus from the stakeholders.

LIC has supported many workshops and training through giving presentations to share results and experience. In particular, LIC has supported CPMU to complete the communication scripts and prepare the discussion contents, carry out the promotion talks for the Project. In addition, LIC has also assisted the relevant stakeholders to complete 3 primary training materials and training materials on how to use the separators.

Two six-month environmental monitoring reports (January - June 2018 and July - December 2018) were prepared and CPMU sent them to ADB. These documents have been posted on the ADB website.

Internal monitoring reports on EMDP, GAP for the first 6 months of 2018 and the last 6 months of 2018 have been completed and sent to ADB.

The lists of LIC's outputs made in each quarter were presented in the quarterly reports of 2018 and attached in Appendix 3 of this report.

8. WORK PLAN FOR THE NEXT QUARTER

According to the contract signed between the CPMU and LIC, the constract will expire by 31th December 2018. Therefore, in the mean time when the contract has not been extended yet, LIC has no plan to implement the next activities.

9. CONCLUSION AND RECOMMENDATIONS

The construction progress of SBPs was stalled due to the Lunar New Year. The number of MBPs constructed during this period is not much. The evaluation and approval of registration dossiers for construction of MBPs is regularly updated in order to timely support the CPMU as well as the PPMUs to promptly implement and effectively manage the constructed works. Besides, the coordinators of the provinces regularly coordinate closely with the provincial technicians to inspect and supervise the biogas plants construction in the project.

The progress of device installation is still slow due to many reasons, including the reason that the design of settling tanks has not met the actual requirements at each farm so LIC continues to actively coordinate and support the contractors to complete the settling tank design drawings, reselect the participating households and assess the use of installed separators.

The research packages being implemented are too slow, which may affect the results as well as the committed implementation schedule.

The consultant continues to support the PPMUs and contractors in preparing training materials and conducting training. However, the PPMUs and contractors need to complete training evaluation according to the overall training plan.

In 2018, the provincial consultants have been active in all provinces. In general, the technical assistance of LIC is quite effective at all stages.

Recommendations:

- The effective implementation of manure separators and biogas generators requires close coordination among CPMU, PPMUs, LIC and the Contractors.

- The installation and testing of manure separators and generators requires close monitoring from CPMU, PPMU and LIC for advice and support on technical issues to handle them timely.
- Although this recommendation was stated in the previous quarterly reports, until the third quarter, the issue has not been solved. Therefore, manuals for using biogas generators in English should be translated into Vietnamese and pasted on the machines for instruction and warning signs should be installed at the generator locations to warn people when using electricity.
- Gas meters should be added to measure the amount of gas produced in the models for more accurate calculation of generators' efficiency and effectiveness.
- The research packages should be combined with relevant model packages at some selected locations for easy comparation with new technology and equipment.
- The production of organic fertilizer from husbandry households using separators should be associated with companies producing organic fertilizers.
- Before installing the separators, the field survey should be carried out so that the manure can be packed right after being separated to reduce packing labor. It is possible to install additional sprayers to make compost inside the packages.
- The acceptance of technology review reports of package 25 and 26 should be speeded up to meet the planned progress.
- There should be a plan utilizing the equipment purchased under package 14 on environmental protection; it is recommended that the research packages should use these equipment for sample collection and analysis.
- LIC's contract shall be quickly approved.

APPENDICIES

Appendix 1: Minutes of the 2017 summation conference and 2018 plan

I. General section

1. Conference purpose: Summarize the consulting activities in 2017 and the action plan for 2018

2. Chaired by: Asia Development Consultants Joint Stock Company (ADC)

3. Guests: Low Carbon Agriculture Project Management Unit (CPMU/ LCASP), Son La LCASP Project Management Unit.

4. Composition: LIC and the provincial consultants.

II. Conference Results:

1. The conference listened to the opening speech of Mr. Nguyen Ngoc Thang, representative of Asia Development Consultants Joint Stock Company and the welcome speech of Mr. Lo Thanh Bang, representative of Son La LCASP PPMU

2. Mr. Nguyen Van Bo, Deputy Team Leader of the consulting team reported the results of the consulting activities in 2017 and the implementation plan for 2018 as well as the consulting relationship with the CPMU's partners and the provincial consultants. He also raised the Consultant's solutions regarding the implementation of the project activities and proposed recommendations to implement the project more conveniently.

3. Mr. Hoang Thai Ninh - Deputy Director of LCASP commented on the contents related to the management of the project as well as the project implementation status and raised key issues in 2018 that the consultant needs to consider and implement, especially the supervision of the local package implementation.

3. The central specialists and provincial consultants spoke on related technical issues: i) Mr. Bui Van Chinh, reported on overcoming the overload of biogas tanks, in which 2 designs limited the overload of biodigesters (small and medium scale) were approved by the CPMU and implemented by Phu Tho PPMU; ii) Ms. Le Mong Phuong, addressed issues related to gender and ethnic minorities; in which, gender and ethnic minority mainstreaming achieved some results but not evenly among the provinces. The gender and ethnic minority indicators were still low in training and workshop reports. Evenmore, some provinces still overlook this work in planning. Therefore, the consultant suggested that the provincial coordinator should work closely with the PPMUs to conduct gender-related monitoring, with special attention to maintreaming gender and ethnic issues into the plans of each province and bidding package as well as requesting CPMU’s support staff incharge of loan to reconsider

the requirement that the husband and the wife together sign the loan agreement, so it must be counted as the loan in the names of both husband and wife; iii) Ms. Le Thi Thoa, institution and policy consultant requested that it was necessary to evaluate the effectiveness of package implementation as a basis for developing mechanisms and policies.

4. Provincial consultants of Ben Tre, Bac Giang, Binh Dinh, Phu Tho and Lao Cai updated on the progress as well as existing issues related to the implementation of Package No. 32 – manure separators and construction of MBPs.

Through initial evaluation, the quality of the installed separators is good, but the separation efficiency is very different. The consultants believed that there are three main reasons related to the performance of the separators, including the ratio of raw matter in the manure (currently in many places, the maure is diluted by using 30-50 liters of water/pig/day); the number of pigs is low <1000 heads) and the separation time as well as the interval between separation times. It is recommended to use separators for farms with more than 1000 pigs and conduct the separation at least twice a week.

In some provinces like Phu Tho, Bac Giang and Binh Dinh, households with separators also have initiatives like installing additional sub-tanks and garbage secreening nets (since the households mix the feed bags when feeding to block the machine.); Adding valves to limit solid waste to settling tanks or mix micro-organism products into waste after separation, packing and composting the waste inside the bags, which is convenient for composting process and delivery to fertilizer buyers. In Phu Tho, the consultant also asked the contractor for the operated the separators at no load, load, maximum capacity to check the performance of the machines, or arrange the separators to pump the clear water in between the scum and sediment layer in order to reduce the amount of water before separation helps improving the separation efficiency. Currently, the sale of products obtained by the separator is very good, the amount of separated manure is sold fully. Binh Dinh PPMU also signed a contract with Binh Dinh Fertilizer Company to purchase all the separated amounts.

However, some contractors consider Package No. 32 as equipment supply package but not model package, so they are irresponsible in the design and supervision of construction of auxiliary works, settling tanks and improperly installing stirrers (hence when the machines operate, manure is splashed into separators, etc.). It is also difficult for the households and provincial consultants to contact the contractors. To ensure the quality of the bidding packages, the CPMU shall remind the contractors to be responsible for the implementation of the contract and closely coordinate with the provincial coordinators during the implementation.

Provinces like Tien Giang and Phu Tho may have to adjust/replace households to install with separators, due to the relevant criteria, especially the number of pigs is not guaranteed. For Ha Tinh, the selection of some slaughter households to install MBPs shall be adjusted

because it is difficult to ensure criteria for using bioslurry for crops, as well as to ensure the sustainability of the models.

Regarding MBPs with volume from 50 - 75m^3, the amount of gas generated is fully used for drying tea, making rice liquor and cooking feed, and these households have signed commitments to implement the project requirements. Son La is also in the process of adjusting households participating in the separator models.

5. Mr. Nguyen The Hinh, the project director was pleased with the conference results, thanked the delegates for their frank and constructive discussions. He hoped to continue to receive the cooperation and support of LIC in the coming time, particulary focusing on the main contents such as (i) animal waste treatment technology, (ii) mechanisms and policies support the implementation of low-carbon agricultural solutions and (iii) promote communication and propaganda activities to introduce the results of project implementation to more people and especially strengthen inspection and monitoring of the project implementation activities in the provinces.

6. Mr. Nguyen Van Bo also noted that the consultant is interested in implementing the following matters in 2018:

(i) Year 2018 is the last year of the project, so each consultant needs to follow his or her responsibility to develop an appropriate plan, which includes prioritizing workdays for the beginning of the year and the last months of the year, even saving some workdays for 2019, if the project is extended.

(ii) Year 2018 is the year of implementing all bidding packages, each consultant, especially the provincial consultant, should pay attention to monitor the progress, take the initiative in monitoring, evaluating, discovering inadequacies to advise timely adjust for the CPMU and PPMUs

(iii) A conference to propose policies in comprehensive treatment of livestock waste will be held in 2018. It is requested that institution and policy consultant team develop detailed plan to submit to the CPMU for implementation.

(iv) The central consultants and provincial consultants should coordinate better with each other and with the focal point of the CPMU as well as PPMUs to work more smoothly and support each other more effectively. At the request of the Project Director, LIC needed to spend more time on field work.

On behalf of the consultants, Mr. Nguyen Van Bo thanked the leaders of the Agriculture Project Management Board and LCASP Project Management Unit for their timely and effective attention and guidance for consultancy activities and look forward to continuing the effective cooperation in the future and thanked for the participation of Son La PPMU. He also conveyed his thank to the association of ACI/ ADConsult for facilitating the consultants' activities.

Annex 2: Summary of implementation results and recommendations for extension of LIC consulting services

1. SUMMARY OF TECHNICAL ASSISTANCE ACTIVITIES (from December 2015 until December 2018)

After 37 months of implementation, Central Project Management Board assessed that LIC has performed most of the tasks mentioned in the Terms of Reference and achieved the following main results.
(The content of evaluation of project implementation results of each expert under the ToR is attached in Appendix 1).

1.1. Infrastructure for livestock waste management (biogas)

LIC has assisted in the construction and operation of small and medium biogas plants (SBP and MBP), supporting safe operation and solving technical problems. The construction and operation of small-scale biogas plants in 10 project provinces are satisfied with almost no incidents. Minor issues such as pipeline maintenance were promptly addressed by PPMU with the support of Provincial Consultants and other Consultants.

Several training materials as well as guidelines for installation, operation and maintenance of biogas plants have been compiled. During the implementation of the project, LIC has supported the construction of 49 MBP with a volume of 50 - <500 m^3 (installed manure separators with 1000-pig farm) or 50 - 500 pigs without manure separators.

1.2. Technical solutions against overload for BP

LCASP with the technical support of the LIC team have studied a number of options to solve the problem of overloading to small-sized biogas tanks so that farmers can operate the tank without any problems. Some specific solutions include (i) constructing a basin in front or behind the seperator tank; (ii) constructing two compost tanks with waste water drainage systems; (iii) constructing a multi-compartment tank to limit overload.

1.3. Monitoring carbon emissions

LIC has conducted a number of gas component measurements in some project provinces. The results showed that methane concentration is satisfied (CH4 = 64 - 71%), while the concentration of Hydro sulfide is very high (H_2S = 2770 - 8196 ppm).
LIC has completed the report of biogas plant installation to reduce greenhouse gas emissions and the report pointed out that the amount of GHG emission reduction depends very much on the size of the biodigester tank.

1.4. Efficient use of biogas slurry and fertilizer production

Currently, there is a tendency of using biogas slurry and biogas waste water to irrigate crops. LIC has compiled documents to guide the use of post-biogas wastewater for plants, including guidelines on the use of biogas wastewater which recommend to use at a rate of 30-40 m^3/ha

of food crops and used on harvested land. The soil work must be done immediately after irrigation.

1.5. Research on Low carbon agriculture

The project has provided technical support for five researchs including need assessment, research objectives and establishing ToR since LIC's mobilization in 2016. ToR has been adjusted after consultation with relevant units including MARD, CPMU, ADB and institutes and this process cost longer than expected. To now, 5 bidding packages have been implemented.

1.6. Demonstrations

Models of manure separators, generators, models of comprehensive waste management (manure separators and generators), models using liquid discharge after biogas plants to irrigate grasses and crops have been well implemented in the provinces. Some models after a period of operation have brought many benefits to the farm owners.

1.7. Capacity strengthening and information dissemination

LIC completed the report on assessment of need for training, which provided an overall training plan with relevant and unified training topics, curriculum, training time and required qualifications of trainers. LCASP's training activities have been implemented systematically after the overall training plan was issued.

Vocational training materials were finalized with comments from the Experts. The Consultant also assisted the Appraisal Committee in evaluating vocational training materials, selecting appropriate experts for the Appraisal Committee. In addition, LIC supported to improve the training materials on topics such as collecting waste, bagasse, slurry and agricultural by-products to produce organic fertilizer and micro-organism fertilizer distribution.

1.8. Environmental safeguard policies

The technical team cooperated with CPMU and PPMUs to environmentally supervise medium-sized biogas plants (MBPs) in accordance with the criteria of environmental safeguard policies. 49 MBPs were expected to be installed in 2017 after the initial environmental evaluation (IEE). The six-month environmental monitoring reports were prepared by LIC and CPMU sent them to ADB for approval. These documents were posted on the ADB's website.

1.9. Safeguard policies on Gender and Ethnic Minorities

CPMU's gender database was collected when the Gender Specialist was mobilized at the beginning of the year. The Consultant supported PPMUs to collect and update data, improve the capacity of PPMU staff, update gender-disaggregated data. EMDP and GAP was prepared to support CPMU. These updated documents were posted on the ADB's website.

1.10. Policies and Institution

The drafted report on policies and institution was completed with the Government's latest decisions and decrees. The workshop on comprehensive management policy for livestock

waste was held in August 2018. The workshop's result is the basis for LIC to finalize the final report on institution and policies.

1.11. Other technical supports

CPMU completed making contract with the consultant for e-library and distance training. The consultant team provided comments for the inception report. Approach and implementation process of the e-library remains unclear, especially sources of information and information digitization. The working process and information exchange mechanism of the distance training team should be clarified. The management of the e-library after the project shall also be clarified. The test run of the e-library is very important to ensure the success.

2. THE OUTSTANDING ISSUES

At the beginning of this package's implementation, CPMU just started implementing the project activities. Initially, both LIC and CPMU faced many difficulties, so the activities were implemented slowly. On the other hand, the operation of LIC is closely linked to the CPMU's activities in order to support and advise CPMU on relevant technical issues. This is the reason for LIC to apply for extension until June 30, 2019 to implement the following outstanding issues and ensure the project results are spread and applied sustainably after the project ends.

Some activities need to continue to be implemented such as models of separators, biogas generators and models of total waste management in the project provinces, organizing training for farmers on biogas use. combine with agricultural extension and communication to raise awareness for people and spread the results of demonstration models, low carbon agricultural use in the local area.

For each component of the project, the Management Board of Agricultural Projects found that LIC consultants should continue to complete the following tasks:

2.1. Component 1: Expanded use of livestock waste management infrastructure

Activities to be carried out in the coming time include:

- Propose the optimal solutions to connect biogas plants with the investment of the corresponding biogas technology value chain;
- Prepare cost estimate for technical items and inputs for biogas technology in different areas, at the same time, develop appropriate methods to assess the impact of biogas technology applied in the project on society, economy, and environment;
- Evaluate the demand for biogas value chain and other low carbon technologies in the project provinces
- Propose solutions to disseminate and replicate biogas technologies in Vietnam;
- Develop a policy and institutional framework to implement and monitor BVC, CSAWMP, certifications, standards and good waste management practices;
- Evaluate potential techniques that can be applied to large-scale implementation of biogas technology in the project areas;

Update training materials for inclusion in the e-library;

2.2. Component 2: Credit lines for biogas value chains

No activitiy to be performed in the extension period.

2.3. Component 3: Transfer of technology for enhanced CSAWMP

Activities to be carried out in the coming time include::

- Coordinate with CPMU to support and supervise the implementation of research and demonstration packages;
- Propose solutions for these technologies to be widely promoted and accepted in the market;
- Collect and process project M&E data through the system of M&E forms, and evaluate the project outputs according to the set of indicators;
- Evaluate the effectiveness of the models that have been implemented in the project;
- Select new technologies that have been successfully applied from research and demonstration models to update training and communication programs.

2.4. Component 4: Effective project management

This component includes both environmental and gender safeguard policies. The tasks related to:

General management of LIC

- Review and update the M&E indicators for project implementation;
- Overall management of the project according to the requirements of Client and ADB;
- Complete reports such as: report in the fourth quarter of 2018, annual report of 2018 and completion report of LIC's tasks;;

Safeguard policies

- Advise CPMU and PPMUs in ensuring compliance with environmental safeguard measures of the Government and ADB;
- Support CPMU and PPMUs in environmental monitoring at biogas plants as required;
- Coordinate with CSWMP consultants to propose recommendations to apply technology for utilizing biogas and bio-slurry from biogas plants;
- Develop environmental reports for sub-projects.

Gender and Ethnic Minorities

- Continue to support and advise CPMU and PPMUs on the implementation of GAP and EMDP to promote gender equality and ensure that women and ethnic minorities equally participate and benefited from the project;
- Conduct community consultation in the project area, to solicit feedback from recommendations;
- Advise CPMU to conduct social impact assessment and any other preparatory surveys, feasibility studies or evaluations.

3. RECOMMENDED TO EXTEND THE LCASP PROJECT FROM JANUARY - JUNE 2019

3.1. Need to extend project

Central Project Management Board proposed LIC project implementation and management services are extended for 6 months, from January to June 2019 for the following reasons:

- 100% of the time for consulting service implementation is from December 2015 to the end of December 2018, including 37 months of service. However, as shown in the results of the above work performance, most of the tasks in the Reference Terms have been completed by the Company and the Consultant, but there are still some activities in progress. Implementation process and is expected to end when the project finishes (for details, please see the report on the performance results of the consultancy positions until the end of 2018).
- At the same time, the disbursement value is estimated to 12/2018 of the whole package: USD 1,625,375 accounts for 75% of the value of the bidding package.
- When the project is finished, the Consultant needs to carry out activities to evaluate and report on the completion of the project, including the following contents:

  + Managing the overall project according to the requirements of Client and ADB;

  + The set of monitoring and evaluation indicators for project implementation is reviewed and updated;

  + Project monitoring and evaluation data is collected and processed through a system of monitoring and evaluation tables and at the same time evaluates project outputs according to the set of indicators;

  + The main outputs of each Component include technical reports, model packages and research, recommendations / recommendations, technical guidance, training, communication results, etc. be viewed and synthesized;

  + The corresponding technical reports and quarterly reports as well as the Project Completion Report are well prepared to meet the requirements of CPMU and ADB donors; and

  + Based on the evaluation findings, further results are proposed to ensure that the project outputs continue to be sustainable and widely applied in the future.

At the same time, Central Project Management Board received ADB's no objection letter on the proposed LCASP project extension from January to June 2019 on …… ..

For the above reasons, Central Project Management Board proposes to extend the LIC consulting service for the 6-month LCASP project, from January to June 2019 with appropriate proposed personnel plans and funds. The book does not change the total contract value.

3.2. Proposed personnel and person-months

In order to complete all major activities and outputs during this 6-month extension period as well as complete the remaining work as described in Section 5. Central Project Management Board has evaluated and received see that the LIC Consultant's personnel plan proposal is appropriate to ensure that consultants complete the tasks effectively and successfully as shown in the table below:

Category	A. Services in Field/Home	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Total person month from Jan to June 2019	Amount Jan-Jun 2019
Code	(Foreign&Local)								
C.1	KEY EXPERTS (International)								
1	Team Leader/ Management Agric. Waste Specialist)	1.00	0.50	1.00	1.00	1.00	1.00	5.50	110,000.00
2	CSAWMP Specialist (LCA Crop Waste)	1.00	0.50	0.49	1.00	1.00	1.00	4.99	94,740.91
3	Monitoring and Evaluation			-	-	-	0.48	0.48	9,120.00
4	Policy and Institutional Specialist on CSAWMP					0.46	0.50	0.96	18,170.91
Sub-Total Costs – International Key Experts								***11.92***	232,031.82
C2.1	KEY EXPERTS (National)								
1	Deputy Team Leader/BVC Development Specialist	**1.00**	**0.50**	**1.00**	**1.00**	**1.00**	**1.00**	5.50	11,000.00
2	CSAWMP Specialist (LCA CropWaste)	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
3	Biogas Technology Specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
4	Extension/Training & Curriculum development Specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
5	Monitoring an Evaluation Specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	7,496.50
6	Social, Gender and Ethnic Minority Specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
7	Environment Safeguard Specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
8	Geographic Information System (GIS) Specialist							-	-
9	ICT specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	7,496.50
10	Policy and Institutions Specialist for CSAWMP	-	-	-	-	-	-	-	-
11	Provincial Coordinator Lao Cai	-	-	-	-	-	0.58	0.58	1,160.00
12	Provincial Coordinator Son La	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
13	Provincial Coordinator Phu Tho	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
14	Provincial Coordinator Bac Giang	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
15	Provincial Coordinator Nam Dinh	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
16	Provincial Coordinator Ha Tinh	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
17	Provincial Coordinator Binh Dinh	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
18	Provincial Coordinator Tien Giang	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
19	Provincial Coordinator Ben Tre	-	-	-	-	-	0.88	0.88	1,760.00
20	Provincial Coordinator Soc Trang	-	-	-	0.64	1.00	1.00	2.64	5,280.00
21	Procurement Specialist	-	-	-	-	-	1.00	1.00	2,000.00
22	TBD - Agriculture Economic Specialist	1.00	0.50	1.00	1.00	1.00	1.00	5.50	11,000.00
Sub-Total Costs – National Key Experts								**93.10**	179,193.00
C2.2	NON-KEY EXPERTS								-
1	To Be Determined - Secretary	1.00	1.00	1.00	1.00	1.00	1.00	6.00	3,900.00
2	To Be Determined - Interpreter	1.00	1.00	1.00	1.00	1.00	1.00	6.00	5,100.00
Sub-Total Costs – Non-key experts								**12.00**	9,000.00
Total Costs : Key Experts (International and National)		***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	**117.02**	420,224.82

LIC would like to confirm that all of the above proposed months together with the costs of office, travel and business operation fees during the extended period from January to June 2019 will be kept no change with the total contract value: USD 2,164,018 (In words: Two

million one hundred and sixty-four thousand and eighteen hundred US dollars) as it aims at using of the balance of the contract amount only after December 2018 of USD 538,642 compared to the estimated amount for 6 months USD 399,007.21 (excluding taxes, contingency) but it includes personnel salaries of USD 323,380 and operating offices, travel costs of USD 75,626 as shown in the table below.

SECTION / STT	DESCRIPTIONS/ KHOẢN MỤC	Unit	Total Contracted /Tổng Hợp đồng	Used up by Dec 2018/Sử dụng đến 12/2018	Remaining/Còn lại	Jan-Jun 2019	BUDGET AMOUNT/ HẠN MỨC	USED UP TO DECEMBER 2018/ SỬ DỤNG ĐẾN THÁNG 12/2018	BUDGET BALANCE REMAINING/ HẠN MỨC CÒN LẠI	BUGDGET in Jan-Jun 2019/Ngân sách trong tháng 1 - tháng 6/2019
1	**REMUNERATION/LƯƠNG CHUYÊN GIA**		**490.00**	**419.28**	**70.72**	**73.01**	**1,651,438.00**	**1,242,869.73**	**408,568.27**	**323,380.73**
C.1	International Remuneration/ *Lương chuyên gia nước ngoài*	Person-Mos.	44.00	28.02	15.98	11.92	866,000.00	552,913.64	313,086.36	232,031.82
C.2	National remuneration/ *Lương chuyên gia trong nước*	Person-Mos.	374.00	324.91	49.09	49.09	731,438.00	640,911.09	90,526.91	82,348.91
C.2	Non-key expert, support staff/ *Nhân viên hỗ trợ văn phòng*	Person-Mos.	72.00	66.34	5.66	12.00	54,000.00	49,045.00	4,955.00	9,000.00
2	**REIMBURSEMENT COST /CHI PHÍ BỒI HOÀN**		**7,570.00**	**5,452.87**	**2,117.13**	**848.79**	**512,580.00**	**382,505.53**	**130,074.47**	**75,626.49**
D.1	Per diem international specialists / *Công tác phí chuyên gia nước ngoài*	Agreed Rate for Perdiem	1,320.00	822.50	497.50	165.00	99,000.00	61,687.50	37,312.50	10,730.45
D.2	Per diem National expert and interpreter (working out of Hanoi)/ *Công tác phí chuyên gia trong nước và phiên dịch*	Agreed Rate for Perdiem	5,800.00	4,335.00	1,465.00	589.05	261,000.00	195,075.00	65,925.00	26,507.09
D.3	International Travel (Visa, air return ticket/ Economy)/ *Đi lại quốc tế*	RT ticket	9.00	7.50	1.50	8.00	14,400.00	12,000.00	2,400.00	12,800.00
D.4	Transportation/ Xe cộ	At cost	252.00	117.61	134.39	50.00	35,280.00	16,465.31	18,814.69	7,000.00
D.5	Domestic Air Ticket (Economy, return ticket)/ *Vé máy bay trong nước*	At cost	80.00	61.26	18.74	18.74	24,000.00	18,377.72	5,622.28	5,622.28
D.6	Office rental/ *Thuê văn phòng*	LS/month	37.00	37.00	0.00	6.00	40,700.00	40,700.00	0.00	6,600.00
D.7	Office operation cost/ *Chi phí hoạt động văn phòng*	LS/month	36.00	36.00	0.00	6.00	25,200.00	25,200.00	0.00	4,200.00
D.8	Office Equipment (rent)/ *Thuê thiết bị văn phòng*	LS/month	36.00	36.00	0.00	6.00	13,000.00	13,000.00	0.00	2,166.67
	TOTAL/ TỔNG						**2,164,018.00**	**1,625,375.26**	**538,642.74**	**399,007.21**
	%							75.1091376	24.89086228	

Appendix 3: Main technical documents compiled by LIC in 2018

1st quarter of 2018

No	Documents	Code	Compiler
1	LIC's annual report 2017 (Eng)	1.Bao cao nam 2017-EN	Manohar Shresha
2	Mission report by International CSAWMP specialist	2. Mission report	Henrik Moller
3	Survey report of households planning to install a separator in Tien Giang	3. Bao cao khao sat tai Tien Giang	Nguyễn Văn Bộ
4	Summary report 2017	4.Bao cao tong ket LIC	Nguyễn Văn Bộ
5	Evaluation report on the proposed construction of a medium-sized biogas tank in Bac Giang	5.Bao cao danh gia tai Bac Giang	Nguyễn Văn Bộ
6	Consultant report 2017 (Viet)	6.Bao cao nam 2017-VN	Nguyễn Văn Bộ
7	A few thoughts on developing organic fertilizer in Vietnam	7.Phan bon huu co	Nguyễn Văn Bộ
8	Detailed design of the model of separation machine in Ha Tinh	8.Mo hinh MTP Ha Tinh	Hồ Thị Lan Hương
9	Report on implementation of demonstration models in Tien Giang	9.Bao cao trien khai mo hinh tai Tien Giang	Hồ Thị Lan Hương
10	Report on assessment of separators	10.Bao cao danh gia MTP	Hồ Thị Lan Hương
11	Appraisal report of six sets of records of Ha Tinh	11.Tham dinh ho so cua Ha Tinh	Hồ Thị Lan Hương
12	Appraisal report of Bắc Giang	12.Tham dinh ho so cua Bac Giang	Hồ Thị Lan Hương
13	Construction profile of Son La average tank	13.xay dung be KSH tai Son La	Hồ Thị Lan Hương
14	Guideline to complete biogas tank	14.Huong dan hoan thien be KSH	Bùi Văn Chính
15	Documents on overloading biodigesters	15.Khac phuc qua tai ham	Bùi Văn Chính
16	Design of solid waste sedimentation tanks	16.Thiet ke be lang	Bùi Văn Chính
17	Report on evaluation of records of	17.Danh gia ho so	Bùi Văn Chính

	households building medium-sized biodigester in Bac Giang	cua Bac Giang	
18	Suggestions for sedimentation design expected to be built in Ha Tinh	18.Thiet ke be lang Ha Tinh	Bùi Văn Chính
19	Suggestions for sedimentation design expected to be built in Nam Dinh	19. Thiet ke be lang Nam Dinh	Bùi Văn Chính
20	Report on the situation of model implementation in Phu Tho	20.Bao cao mo hinh Phu Tho	Bùi Văn Chính
21	Document describing biogas technology USAB and KT31	21.Cong nghe KSH	Bùi Văn Chính
22	Suggestions for 5 media topics	22. Gop y truyen thong	Phạm Thị Vượng
23	Summary of training results, propaganda information	23.Ket qua dao tao truyen thong	Phạm Thị Vượng
24	Report the treatment of solid waste into organic fertilizer	24.Phan bon HC	Phạm Thị Vượng
25	Sample of gender and ethnic minority training effectiveness assessment	25. Danh gia dao tao	Phạm Thị Vượng
26	Report of internal environmental assessment of provinces	26.Danh gia MT noi bo	Tạ Hòa Bình
27	Initial environmental assessment report of producers	27.IEE	Tạ Hòa Bình
28	Periodic environmental assessment report (Viet)	28.Danh gia MT dinh kỳ -VN	Tạ Hòa Bình
29	Periodic environmental assessment report (Eng)	29.Danh gia MT dinh ky - EN	Tạ Hòa Bình
30	GAP 4th Quarter- Report	30.GAP	Lê Thị Mộng Phượng
31	Internal monitoring report for EMDP	31.EMDP	Lê Thị Mộng Phượng
32	Sample of gender and ethnic minority training effectiveness assessment	32.Bao cao ra soat	Lê Thị Mộng Phượng
33	Monitoring report for GAP implementation	33.Bao cao thuc hien GAP	Lê Thị Mộng Phượng
34	Monitoring report for EMDP implementation	34.Bao cao thuc hien EMDP	Lê Thị Mộng Phượng

2nd quarter of 2018

No.	Document name	Code	Prepared by
1	Organic agricultural production in Vietnam: opportunities, challenges and issues of concern	1. San xuat nong nghiep huu co	Nguyen Van Bo
2	LCASP achievements in 2017	2.Thanh tuu cua LCASP	Manohar Shrestha Nguyen Van Bo
3	Review of inception report of Package No. 25	3.Nhan xet BCKD goi 25	Nguyen Van Bo
4	Review of inception report of Package No. 26	4.Nhan xet BCKD goi 26	Nguyen Van Bo
5	Results of the institution and policy mission in Son La and Bac Giang	5.Bao cao chinh sach	Bui Ba Bong, Nguyen Van Bo, Le Thi Thoa
6	Some notes when using biogas generators	6.Mot so luu y	Bui Van Chinh
7	Comments on settling tank design of separator model in Tien Giang	7.Gop y thiet ke tai Tien Giang	Bui Van Chinh
8	Instructions for installing biogas generators	8.Huong dan lap dat	Bui Van Chinh
9	Comments on settling tank design of separator model in Ha Tinh	9. Gop y thiet ke tai Ha Tinh	Bui Van Chinh
10	Comments on method to evaluate the performance of the separators	10.Gop y hieu suat may tach phan	Bui Van Chinh
11	Using bio-slurry after biogas	11.su dung nuoc xa	Bui Van Chinh
12	Comments on continuous settling tank design of the separators (Package No. 25)	12.Gop y be lang goi 25	Bui Van Chinh
13	Improvements of manure pressers to produce organic fertilizers	13.Cai tien MTP	Bui Van Chinh
14	Proposal on continuous settling tanks	14.De xuat be lang	Bui Van Chinh
15	Method of producing organic fertilizer from the separators	15. Phuong phap SX phan bo	Pham Thi Vuong
16	Training materials to prevent the overloading of bio-digesters	16.Chong qua tai	Pham Thi Vuong
17	Training materials to instruct on full usage of biogas	17.Su dung khi sinh hoc	Pham Thi Vuong
18	The results of working with Que Lam Fertilizer Group on the production of organic fertilizers	18.Bien ban lam viec	Pham Thi Vuong

19	Minutes of cooperation between CMU and Que Lam Group	19.Bien ban hop tac	Pham Thi Vuong
20	GAP report (English)	20. GAP EN	Le Thi Mong Phuong
21	Report of the first 6 months of EM	21. Bao cao DTTS	Le Thi Mong Phuong

3rd quarter of 2018

No.	Document name	Code	Prepared by
1	Proposal on developing organic fertilizer from livestock waste by value chain in Binh Dinh province	1.Quy 3 – De cuong phan huu co	Nguyen Van Bo
2	Proposal on developing organic fertilizer from livestock waste by value chain in Binh Dinh province	2.Quy 3 – De cuong phan trun	Nguyen Van Bo
3	Improvement of manure separators for organic fertilizer production	3. Quy 3 – Manure seperators	Nguyen The Hinh, Nguyen Van Bo, Pham Thi Vuong, Bui Van Chinh
4	Biogas technology applied in the LCASP	4.Quy 3- Biogas technology	Nguyen The Hinh, Nguyen Van Bo and Bui Van Chinh
5	Using bio-slurry from bio-digesters for fertigation for crops	5.Quy 3 – Bioslury	Nguyen The Hinh, Nguyen Van Bo and Bui Van Chinh
6	Comments on the design of solid waste settling tanks of each farm for the separator model in Tien Giang	6.Quy 3- Thiet ke be lang Tien Giang	Bui Van Chinh
7	Advanced training materials for techinicians	7.Quy 3 – Tai lieu tap huan KTV	Bui Van Chinh
8	Current status of livestock waste management in Vietnam	8.Quy 3 – Hien trang chan nuoi	Bui Van Chinh
9	Comment on the proposed model "using bio-slurry after bio-digesters as fertilizer for fruit trees and industrial plants at household group scale in Ha Tinh	9.Quy 3 – Gop y mo hinh Ha Tinh	Bui Van Chinh
10	34 articles presented at the policy workshop	10. Quy 3 – hoi thao chinh sach	
11	LIC's 1st quarter report of 2018 (Vietnamese)	11. Quy 3 – Bao cao quy 1 – VN	Le Thi Thoa

12	LIC's 1st quarter report of 2018 (English)	12. Quy 3 – Bao cao quy 1 – EN	Le Thi Thoa
13	Report on implementation results of the research packages	13. Quy 3 – Bao cao goi thau nghien cuu	Le Thi Thoa
14	Report on attending the mid-term review mission of ADB	14. Quy 3 – Bao cao doan danh gia ADB	Le Thi Thoa

4th quarter of 2018

No.	Document name	Prepared by
1	Drafted Guidelines for operation, technology transfer on the system of separator and organic fertilizer production from the products obtained after pressing	Bui Van Chinh
2	Drafted Evaluation on the actual effectiveness of the demonstration model: Using the separators for treating livestock waste to collect solid waste and make it into organic fertilizer for crops	Bui Van Chinh
3	Detailed report on occupational survey results: Production of animal feed from crop residues	Bui Van Chinh
4	Evaluation on the actual effectiveness of the demonstration model: Using the separators for treating livestock waste to collect solid waste and make it into organic fertilizer for crops	Bui Van Chinh
5	Proposed institution and policies to advise MARD and other organizations such as VBA, development of institution and mechanisms for Biogas technology and Biogas value chain management	Bui Van Chinh
6	Draft Manual on the construction, development, operation, and maintenance of systems using liquid discharge of bio-digesters as fertilizer for crops	Bui Van Chinh
7	Proposing method of dissemination and replication of biogas technology in Vietnam	Bui Van Chinh
8	Solutions to overcome the overloading of biogas tanks	Bui Van Chinh
9	Guidelines on installation, operation and maintenance of biogas generator systems	Bui Van Chinh
10	Guidelines on construction and maintenance of medium-scale biogas plants	Bui Van Chinh
11	Report on biogas value chain and low carbon agriculture of the project area	Nguyen Thi Vuong
12	Report on assessment of training results to improve the capacity of the LCASP in 3 provinces: Bac Giang, Phu Tho and Lao Cai	Nguyen Thi Vuong

13	Draft manual for construction, operation and maintenance of biogas generators	Le Thi Thoa
14	Instruction for thorough use of excess gas	Le Thi Thoa
15	Leaflets to introduce the demonstration models of LCASP	Le Thi Thoa
16	LCASP comprehensive implementation report	Le Thi Thoa
17	Evaluation report on demonstration models in 4 provinces: Nam Dinh, Phu Tho, Binh Dinh and Soc Trang	Le Thi Thoa, Bui Van Chinh and Nguyen Dinh Vinh