Co-managed Investments for Watershed Management with Carbon Finance Benefits

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Abstract

In 2004, the LLDA implemented two pioneering projects in the Laguna de Bay Region, The Laguna de Bay Institutional Strengthening and Community Participation Project (LISCO) and the The Laguna de Bay Community Carbon Finance Project (Carbonshed Project). Both projects are intended to improve environmental quality and to sustain effective watershed management through the involvement of the different Local Government Units and communities. LISCO aims to actively engage the Local Government Units (LGUs) and other stakeholders in implementing environmental sub-projects and in strengthening the capacity of institutions in environmental governance. Complementary to LISCO, the Carbonshed Project aims to bring the benefits of Carbon Finance through Clean Development Mechanism (CDM)-eligible sub-projects that addresses the primary environmental problems in the watershed such as pollution from solid and liquid wastes. It provides the enabling environment for a Carbon Market for small-scale environmental sub-projects by the Local Government Units and the communities that reduce the greenhouse gas emissions in the watershed. The first bundle of CDM-sub-projects is already registered with the CDM Executive Board under the United Nations Framework Convention on Climate Change (UNFCCC). The estimated total Emissions Reductions (ERs) over a 7 year crediting period is 42,245 tCO$_2$-e.

An Emission Reduction Purchase Agreement or ERPA was already signed between the Laguna Lake Development Authority in behalf of the LGU-project participants, and the World Bank in behalf of the buyers of the Carbon credits. The first payment of Carbon Credits is expected in 2011.

An inventory of greenhouse gases in the Laguna de Bay watershed was conducted and presented in various GIS maps. So far, this is the first inventory of this kind in the Philippines. One third of the emissions are directly related to watershed management, namely land conversion, wastewater discharge, solid wastes and forest cover.

*Keywords*: Institutional strengthening, stakeholder involvement, environmental sub-projects, greenhouse gases, carbon credits, clean development mechanism
1. Introduction

The Laguna de Bay watershed is occupied by 13 cities and 48 municipalities belonging to 5 Provinces and the Metropolitan Manila Area. Politically and administratively, these government units are governed by elected officials starting from the Provincial Governors to the City or Town Mayors and to the Barangay Captains (a barangay is the smallest political unit in the Philippines). There is also the Metropolitan Manila Development Authority which exercises planning, monitoring and coordinative functions, as well as regulatory and supervisory authority over the delivery of metro-wide services within Metro Manila without diminution of the autonomy of the local government units. Metro Manila is composed of 17 cities and municipalities considered as a special administrative region by the Philippine Government.

![Figure 1. Local Government Units (LGUs) in the Laguna de Bay Watershed](image)

While the Laguna Lake Development Authority is mandated by Philippine Law to “to promote and accelerate the development and balanced growth of the Laguna Lake area and the surrounding provinces, cities and towns ... with due regard and adequate provisions for environmental management and control, preservation of the quality of human life and ecological systems, and the prevention of undue ecological disturbances, deterioration and pollution,” the Local Government Code of 1991 empowered the Local Government Units to share with the national government the responsibility in the management and maintenance of ecological balance within their territorial jurisdiction, subject to the provisions of the Code and national policies. With these overlapping mandate, close coordination and partnership between the LLDA and the Local Executives need to be strengthened and harmonized for the efficient management of the watershed. This proves to be very challenging when each of the administrative units and political units exercise their own mandate in the absence of thorough consultation or adherence to watershed-wide policies, rules and regulations.
The platform for co-management of the lake’s watershed between the LLDA and the LGU’s came in 2004 which also provided opportunities for capacity building and institutional strengthening not only on both sides but with communities as well. The World Bank and the Royal Dutch Government provided the financial support to the LLDA through the Philippine Government to implement the Laguna de Bay Institutional Strengthening and Community Participation Project or LISCOP. As an added benefit, another pioneering initiative, the Laguna de Bay Community Carbon Finance Project was also implemented by LLDA in the same year to help mitigate harmful greenhouse gas (GHG) emissions in the watershed and to produce Carbon Credits under the Clean Development Mechanism (CDM) of the Kyoto Protocol. A Project Management Office was created in LLDA to oversee the implementation of both Projects under the supervision of the LLDA’s Assistant General Manager.

2. The Laguna de Bay Institutional Strengthening and Community Participation Project (LISCOP)

LISCOP has just been developed by the LLDA and is waiting for approval by the Executive Branch of the Philippine Government during the preparation of the first Laguna de Bay's brief in 2003 for the GEF-funded project on "Towards a Lake Basin Management Initiative: Sharing Lessons and Experiences from GEF and non-GEF Lake Basin Management," which was principally implemented by the International Lake Environment Committee Foundation (ILEC). The LLDA started to operate the project in 2004 which was financed through a loan from the World Bank at USD 5 million, an equivalent grant of USD 5 million from the Royal Dutch Government and a counterpart fund from the Philippine Government of USD 2.2 million. LISCOP is supposed to be a five-year project (2004-2009), but was extended until December 2010.

The main objectives of LISCOP are:

a. To improve the environmental quality in the Laguna de Bay basin by engaging Local Government Units (LGUs) and other stakeholders in implementing environmental sub-projects.

b. To ensure that Laguna de Bay and its watershed are managed effectively and in a sustainable manner by strengthening the capacity of institutions in environmental governance.

To attain these objectives, LISCOP was implemented under two components. Component 1 is Co-managed Investments for Watershed Development and Component 2 is Strengthening Institutions and Instruments. The first component targets the identification, development and implementation of environmental sub-projects by LGUs while the second component is geared towards re-structuring the LLDA as an effective watershed management agency with developmental, regulatory and business functions, the latter in the form of investments in environmental infrastructure. Institutional strengthening and capacity building will involve not only the LLDA but also the LGUs, the River Councils and the communities with the end-goal of securing sustainability in effective water resources management and institution building.
3. The LLDA Community Carbon Finance Project

A parallel project to LISCOP is the Laguna de Bay Community Carbon Finance Project or Carbonshed Project, which is funded through a grant of USD 358,450.00 from the Japan Climate Change Initiative being administered by the World Bank. It aims to develop an enabling environment for a carbon market for small-scale environmental interventions in the Laguna de Bay watershed, taking into prime consideration the community-driven sub-projects under LISCOP. Thus, the package becomes more attractive with additional incentives from Carbon Emission Reduction Revenues (CERRs) if the LISCOP funded subprojects are CDM-eligible. The Community Development Carbon Fund (CDCF) and the Bio Carbon Fund (BIOCF), which are managed by the World Bank, will buy Carbon credits from emission reduction subprojects and carbon sequestration subprojects, respectively. The Carbonshed Project started in 2004 and ended in July 2008. Thereafter, the LLDA created a Carbon Finance Unit to continue the implementation of the project.

The main objectives of the Carbonshed Project are:

a. To mitigate the emission of greenhouse gases by engaging the cooperation and participation of local government officials and communities with the purpose of enhancing their capacities in environmental governance.

b. To get benefits from Carbon Finance, through the Clean Development Mechanism (CDM) of the Kyoto Protocol.

The key activities are programmed to a) build the capacity of the LLDA as an intermediary to enable small-scale environmental projects to result in certifiable emission reductions; b) pilot the implementation of carbon emissions reducing interventions that address priority environmental issues such as pollution and siltation; and c) prepare a set of environmental projects from which emissions reductions credit could be purchased.

Like LISCOP, the main beneficiaries are the communities and local governments who will be provided the opportunity to receive emissions reductions credits from their environmental projects. They will also be trained to implement and monitor their CDM-eligible subprojects to ensure that they are effectively converted into carbon credits.

Another output from the project is a greenhouse gas (GHG) inventory in the entire basin that will serve as a tool for better mitigation measures and in planning appropriate climate change adaptation strategies.

4. Development of LISCOP and Carbonshed Sub-projects

4.1. The LEAP Process

LGU sub-projects under LISCOP should be demand-driven and its identification should be done in a highly participatory and meaningful manner. To ensure that these essential requirements will be met, the LLDA developed the Laguna de Bay Environmental Action Planning Process or LEAP, a planning tool that involves a step-wise approach to enhance the capability of stakeholders in each sub-watershed to actively and effectively pursue an environmental agenda in their respective area. The vital steps are as follows:
a. the conduct of participatory micro-watershed characterization to identify environmental issues and various causes and sources of environmental degradation;

b. the development of micro-watershed vision and the formulation of objectives to attain the vision;

c. the identification of measures to attain the vision through sub-projects that would mitigate the environmental problems in the micro-watershed and;

d. the prioritization of a sub-project that will contribute most to the attainment of objectives.

Figure 2. The LEAP Process

The introduction of Carbon Finance benefits through the Carbonshed Project comes after step c, i.e., after the Local Government officials and the communities have shortlisted at least three sub-projects to mitigate the most pressing environmental problem in their municipality. This is done to ensure that sub-project prioritization is not biased towards the Carbon Emissions Reduction revenues that they can get during implementation. Aside from this financial opportunity, the stakeholders were made aware of the pressing environmental problems on Global Warming and Climate Change and the need to reduce the amount of GHGs in the atmosphere.

5. LISCOP and CARBONSHED Project implementation

For this impact story, the focus will be on Component 1 due to its direct link to the Community Carbon Finance Project which by far is the only project being implemented in a lake basin-wide scale.
5.1. Sub-project Financing

Distribution and allocation of funds for sub-projects follow a National Government-Local Government Unit Sharing Policy. These depend on the sub-project category, i.e. either Green/Blue Sub-projects or Brown Sub-projects, and LGU classification ranging from 1st class to 6th class city or municipality depending on their income level (Table 1). Due consideration is given to low-income LGU (5th and 6th class) wherein the grant component is higher than the loan component. The reverse is true for 1st and 2nd class municipalities wherein the loan component is higher. The LLDA shares half of the equity requirement with the LGU making the package more attractive to the local officials to join the LISCOP project. Screening of LGU participants is done with assistance from the Department of Finance to determine their borrowing and paying capacity. The loan is payable in 15 years with 3 years grace period at an interest rate of 12% per annum. If the LGU defaults on its loan obligation, the Municipal Development Fund Office (MDFO) of the Department of Finance will intercept their Internal Revenue Allotment (IRA).

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<th>NG-LGU Cost-Sharing Policy</th>
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<td><strong>Green/Blue Subprojects</strong> – Reforestation, Forest Related Activities, Soil Conservation, Mangrove &amp; Watershed Protection</td>
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| Brown Subprojects – Solid Waste Management Project, Drainage, Sewage, Sanitary Support Facilities |

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Table 1. National Government-LGU Cost Sharing Scheme

5.2. Development of CDM sub-projects

Once an LGU and the community have collectively chosen their priority sub-project, the LLDA Carbonshed Team conducts further assessment to determine its eligibility as CDM. Through the Carbonshed Grant, technical assistance was provided by the World Bank’s Carbon Finance Unit in meeting all the requirements for registration of CDM projects with the United Nations Framework Convention on Climate Change (UNFCCC). In the process, the Carbonshed Team are also trained in every step of the tedious CDM registration.
Thrity two (32) LGU sub-projects located in different cities and municipalities in the watershed were produced out of LISCOP. Fifty three percent (53%) is on solid waste management through Materials Recovery Facility (MRF) with composting while others are on ecotourism, flood control, and waste water treatment. Composting is a CDM-eligible project under the Methane Avoidance category so all composting projects were further studied and assessed by the LLDA Carbonshed Team to generate the information that will be needed in the preparation of the Project Design Document (PDD), a basic requirement for CDM registration. Since these sub-projects are small-scale in nature, they were bundled under the CDM rules, wherein the total emissions reduction from a bundled sub-projects should not exceed an annual treshold of 60 kilo tonnes CO₂-e (Carbon dioxide equivalent).

Figure 3 is a simple illustration on how Carbon Credits are formed. The business as usual (BAU) is the situation when nothing is done to reduce the emission of GHGs in the atmosphere. Organic wastes dumped in sanitary landfill or controlled dumpsite will emit harmful GHG such as methane due to anaerobic decomposition. By collecting organic waste to convert it to compost material, carbon dioxide is produced rather than methane which has a global warming potential (GWP) of 21 as compared to CO₂ with a GWP of 1. The difference from a more potent GHG to a less potent GHG is the Carbon Credit.

Figure 3. How Carbon Credits are Generated from CDM Projects

5.3. Registration of CDM sub-projects

The registration of CDM sub-projects with the CDM-Executive Board follows a tedious and technical process. Figure 4 outlines the steps in the development of a CDM project until the purchase of Verified Emissions Reductions (VERs) by the World Bank and the disbursement of the Carbon Emissions Reduction Revenues to the participating LGUs. Detailed information could be obtained at the CDM website (http://cdm.unfccc.int/index.html).
The first bundle of CDM sub-projects from 7 LGUs under the Laguna de Bay Community Waste Management Project: Avoidance of Methane Production from Biomass Decay through Composting, was registered with the UNFCCC-CDM Executive Board on March 16, 2008. The estimated total Emissions Reductions (ERs) over a 7 year crediting period (2008-2014) is 42,245 tCO$_2$e. The second bundle is now in the process of registration with total ERs estimated at 16,012 tCO$_2$e over a 7 year crediting period (2011 – 2017). The buyers of the Carbon Credits is the Community Development Carbon Fund (CDCF) and is being represented by the World Bank.

Figure 4. Steps in the development of a CDM subprojects

Figure 5. Registered CDM sub-projects in Laguna de Bay
The global environmental outcomes from the implementation of Clean Development Mechanism sub-projects is estimated to reduce by 25% the total GHG emissions in the Laguna de Bay watershed.

5.4. Legal Agreements on the sale and purchase of Carbon Credits

5.4.1. The Emissions Reduction Purchase Agreement (ERPA)

The ERPA is an agreement between the World Bank and the LLDA on the conditions to sell and purchase Verified Emission Reductions (VERs) from the sub-projects including the price per ton of carbon dioxide equivalent (tCO2-e). The ERPA for the Methane Avoidance sub-projects was signed by the World Bank and the LLDA in June 2006 wherein the LLDA is committed to sell 40,614 t CO2-e.

The LLDA acts as the intermediary between the World Bank and the LGU. Once the Carbon Credits are generated from the composting project of each participating LGU, an independent verifier or Designated Operational Entity (DOE) duly licensed by the CDM-Executive Board, will be hired by the World Bank.

5.4.2. The sub-ERPA

The LLDA is directly responsible to the World Bank to sell the agreed volume of Carbon Credits which will be generated from the composting projects of different LGU participants. If the LLDA default on its obligation, there are penalty provisions stipulated in the ERPA, one of which is the conversion of the grant into loan. Thus, aside from the Memorandum of Agreement between the LLDA and the LGU, a sub-ERPA is also signed between the LLDA and each participating LGU to legally bind the latter in delivering the Carbon Emissions Reductions (CERs). Like the ERPA, the sub-ERPA specifies the conditions to the transfer and purchase of VERs. This document needs to be signed during the PDD preparation, wherein the LGUs commit to sell his VERs only to CDCF through the World Bank.

6. Other Essential Components of the Carbonshed Project

6.1. Greenhouse Gas Inventory in the Laguna de Bay Watershed

The inventory of greenhouse gas emissions in the watershed was conducted through the assistance of consultants hired by the LLDA and funded through the Carbonshed Project Grant. This is the first inventory in the Philippines done in a watershed scale. Various emissions sources using the 2003 data were looked into such as those from the energy sector, agriculture, industry, land conversion activities, wastewater discharge and solid wastes. Carbon sequestration from the forests were also included in the inventory. Figure 6 shows the total GHG emissions in the Laguna de Bay watershed while Figure 7 is a representation of the quantity of GHG emissions from various sources. Forty (40) percent of the emissions are directly related to development pressures in the watershed.
Figure 6. Greenhouse Gas Inventory in the Laguna de Bay Watershed

Figure 7. Watershed Management and GHGs in the Laguna de Bay Watershed
Validation of the information generated in the GIS maps is necessary but this will entail a lot of financial and technical resources and may have to be on hold for sometime. Likewise, the downscaling of the GHG inventory on a sub-watershed scale is needed to come out with a more detailed assessment if a city or municipality is a net Carbon emitter or a net Carbon sink. This will better guide the LLDA and the LGUs on GHG mitigation measures which will also address the different pressures in the watershed. Proper waste management, controlled and well-managed land conversion, reforestation and afforestation activities will not only mitigate GHG emissions but also reduces pollution, erosion and sedimentation of the lake.

6.2. Capacity Building

As a pioneering initiative not only in the Laguna de Bay basin but in the Philippines as well, the LLDA Carbonshed Project Team were trained to prepare Project Design Document (PDD), a very technical document that should be in compliance with the CDM rules. The latter is very dynamic and requires CDM project developers and implementors to be always updated on the rules and on the registered methodologies.

The generation of Carbon Credits depend on good sub-project implementation and monitoring. Both the LLDA team and the LGU staff assigned in the MRF and composting sub-projects underwent trainings on composting operation, project monitoring and reporting in accordance with the PDD. The monitoring forms were designed to incorporate all the data needed in the computation of GHG reduction and the corresponding Carbon Credits. Trainings are being done on a periodic basis to keep abreast of the CDM requirements.

7. Mainstreaming of Carbon Finance in LLDA’s operation

At the end of the grant period in July 2008, the LLDA transformed the Carbonshed Project Team into a Carbon Finance Unit (CFU) to continue the tasks and to ensure that the ERPA commitments are met. LLDA’s corporate funds are used in the operation of the CFU. However, the staff comes from different units and their assignment in the CFU are on top of their work load in their respective mother unit. This has always been the set-up in LLDA due to restrictions in hiring additional personnel in accordance with the Civil Service Rules. The bulk of the work after CDM registration is on monitoring since this will determine if emissions reductions were achieved and if Carbon Credits are due to the CDM project participants.

8. Opportunities and Challenges in Co-managed CDM sub-projects

Through LISCOP, the local government officials and the communities became more aware of the environmental situation in their area and of their important role in watershed management. It also gave them the opportunity to undergo various trainings to capacitate them in performing their roles and in meeting their obligations. Carbon Finance through CDM is an added benefit to the LGUs but more than this is the awareness of key stakeholders on Global Warming and Climate Change. GHG mitigation does not only reduce the amount of harmful gasses in the atmosphere but
also translates into actions for environmental protection and management in the Laguna de Bay Basin such as waste management and erosion control through proper land use.

With regards to the CDM sub-projects, the bigger challenge is the proper operation of the composting facility to generate as much CERs as possible due to the commitment in the ERPA and sub-ERPA. Skills are needed to monitor these sub-projects in accordance with the procedures and requirements specified in the PDD. Some LGU staff assigned to implement and operate the sub-project take their obligation seriously while others have yet to fully realize the importance of their tasks not just for Carbon Credits but for effective watershed management. Some local officials take seriously the appointment of project staff and the trainings that are being given to them. Election of local officials happens every three years thus it is inevitable that there will be changes in leadership and staff. The LLDA is always on guard of this situation which is an important factor in the monitoring and evaluation of both LISCOP and Carbon Finance sub-projects. This kind of dynamics in the LGUs necessitates continuous training and mentoring. On a smaller scale, the same dynamics happen in LLDA due to staff resignation.

Another challenge is the development of more CDM sub-projects vis a vis the high transaction cost for project development and registration. Other mechanisms are being developed as talks and negotiations of the Conference of Parties of the United Nations Framework Convention on Climate Change (COP-UNFCCC) prosper, but there are always practical alternatives to reduce GHG emission even outside of CDM.

The change in behavior of the stakeholders with regards to environmental awareness, stewardship and responsibilities is difficult to quantify but their evolving commitment and participation in environmental enhancement including GHG reduction are the encouraging results of LISCOP and the Carbonshed Project. The different components of these projects are part of the Integrated Lake Basin Management of Laguna de Bay and their effective implementation provides support to the six pillars of ILBM.

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