

JAPAN'S INITIATIVE TOWARD ESTABLISHMENT OF NEW MECHANISMS

Lessons Learnt from Case Studies 2010



Ministry of the Environment, Japan



Global Environment Centre Foundation

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Introduction

The Ministry of the Environment, Japan (MOEJ) and Global Environment Centre Foundation (GEC) have launched Feasibility Study (FS) Programme on New Mechanisms since 2010, in order to solicit a project or an activity supposed to be implemented under New Mechanisms in the post-2012 framework for global climate change mitigation. This Programme has started based on lots of experiences from CDM/JI Feasibility Study Programme since 1999.

In FY2010, following three (3) feasibility studies were conducted by Japanese private entities respectively under the FS Programme;

- Feasibility Study for NAMA in Waste and Wastewater Management Sector in Thailand
- Feasibility Study on Transportation NAMA in Lao PDR
- Feasibility Study on NAMA for Sustainable Peatland Management in Indonesia

The main purpose of the FS Programme on New Mechanisms is to accumulate knowledge and know-how from these studies, to share information with relevant stakeholders including private sector and public sector both in Japan and a host country, and to contribute to create shared visions on New Mechanisms. Along with this overall aim, the programme was carried out for the following objectives:

- To acquire useful information based on concrete projects/activities (as case studies)
- To disseminate FS results to create shared visions on New Mechanisms among Parties and other stakeholders
- To provide possible proposals to establish MRV criteria/standards and methods.
- To consider what options to generate transferable carbon credits are feasible and acceptable, and
- To promote discussions on ways to mobilize public funding and private investment into climate change mitigation measures.

In order to achieve those objectives, the following items are focused by each feasibility study under the programme:

- To survey current practices and existing and future policies and strategies in a host country,
- To collect existing necessary data, or to acquire data not archived in a host country,
- To consider the Reference Scenario as well as BaU (Business-as-Usual) and/or alternative baseline scenarios, and to propose options to set up the most plausible Reference Scenario in a host country,
- To consider how to monitor GHG emissions,
- To clarify how to calculate and quantify GHG emission reductions (and/or GHG reduction potentials),
- To investigate how to ensure MRV of GHG emission reductions, and
- To provide possible inputs/literature to promote international negotiations on New Mechanisms.

The studies made it clear that new mechanism had a big potential to cover GHG reduction from projects/sectors which CDM/JI couldn't be applied. They made rough estimation of GHG emission reductions from a target sector/project, and proposed a concept of "Measurement, Reporting, and Verification (MRV)" of GHG emission reductions under New Mechanisms. Though there will be a long way to establish a feasible MRV system, we made a first big step in 2010. We believe that those efforts through the FS programme will lead to a pathway to low-carbon and sustainable world.



Chapter I: FS for NAMA in Waste and Wastewater Management Sector in Thailand – 1st year's findings

implemented by the Institute for Global Environment Research, Pacific Consultants Co., Ltd. (PC-iGER), in cooperation with Thailand Greenhouse Gas Management Organization (TGO)

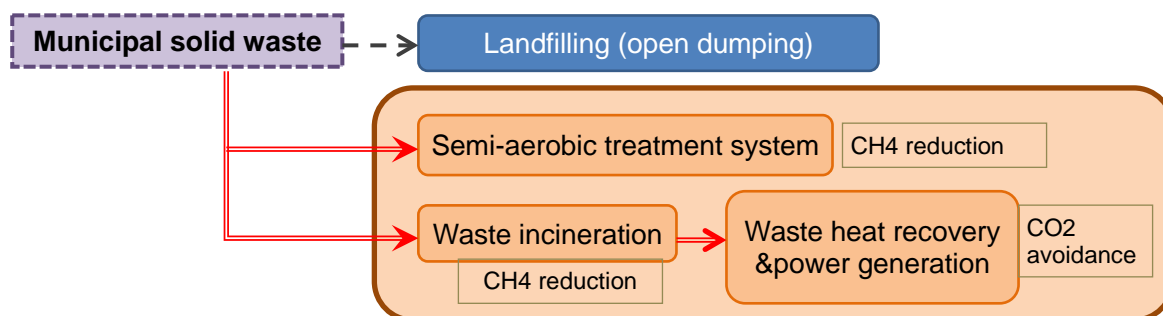
(1) Outline of the FS

Discussion about NAMAs is one of the hot issues among international negotiations. The detailed definition has not been fixed yet, but it is pointed out that there could be three types of NAMAs, i.e., Domestic NAMAs, Supported NAMAs, and Credited NAMAs.

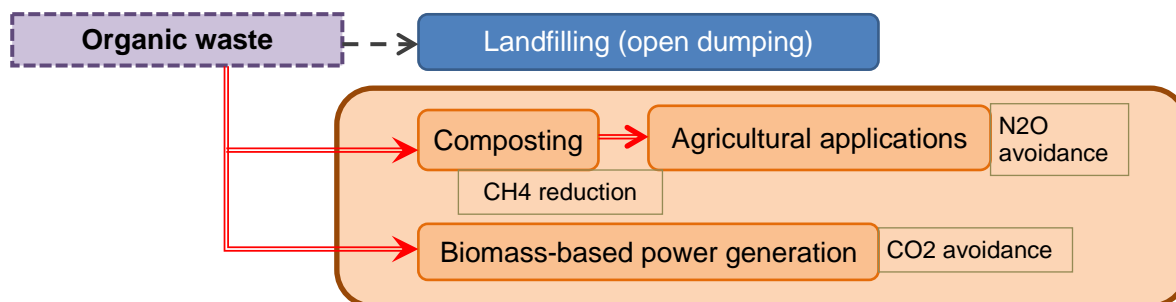
In this FS, first a methodology to establish NAMA plan as well as to identify appropriate NAMA projects is proposed. The FS focused on waste and wastewater management sector in Thailand. We proposed co-benefit type mitigation project candidates in the waste sub-sector which will be carried out by applying Official Development Aid (ODA), Other Official Flows (OOF), and/or Public-Private Partnership (PPP) and Private Finance Initiative (PFI).

The FS covers following GHG emission reduction potential sources:

- (i) Municipal solid waste management:
 - Methane (CH₄) emission reductions by introducing semi-aerobic treatment system to sanitary landfill sites,
 - CH₄ and carbon dioxide (CO₂) emission reductions by introducing incinerators with waste heat recovery – generation system to replace grid electricity, etc.



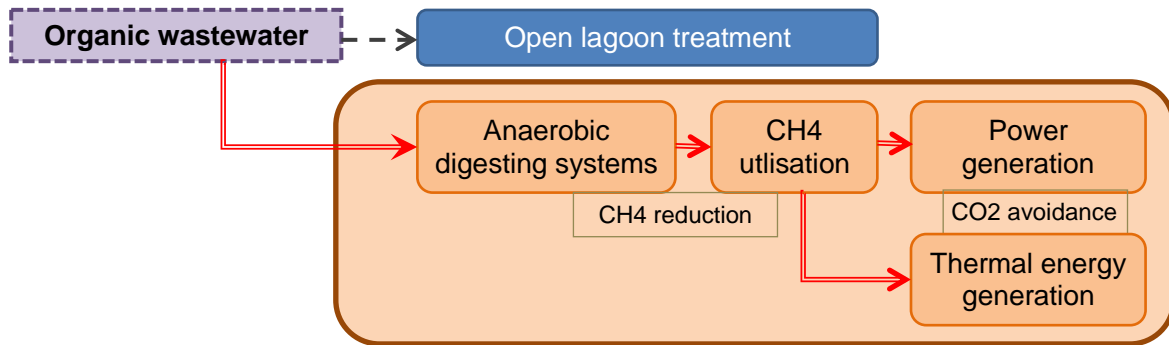
- (ii) Organic waste management:
 - CH₄ emission reductions by introducing composting technologies,
 - Nitrous oxide (N₂O) emission reductions through the replacement of chemical fertilizer with organic composts,
 - CH₄ emission reductions by introducing biomass power generation technologies/systems, and CO₂ emission reductions by replacing grid electricity, etc.



- (iii) Organic wastewater management:
 - CH₄ and CO₂ emission reductions through the replacement of open lagoon systems with



anaerobic digesting systems, using ultra-high temperature aerobic fermentation systems (YM Aerobes), or CH₄ collection and power generation systems to food-related industries which emit high organic wastewater such as sugar, alcohol, and palm oil mills.



(2) Development of a Methodology for NAMA Planning

According to the collected data and information, a methodology for NAMA planning in waste management sub-sector was developed and proposed by the FS entity. The methodology should be suitable and feasible to the host (developing) countries considering the following points:

- To enable to pick up NAMA projects to support current policies and plans, and to integrate mitigation options in the NAMA sector to existing development policies plans,
- To enable to establish reference scenarios under limited availabilities of data and information in the host countries, and
- To enable to consider financial plans and practical schedule for the implementation of the projects which will enhance feasibility and realization potential of the projects

The draft methodology was developed through discussion with TGO and distributed at COP16 as a brochure.

Application of the 7 Steps methodology to municipal solid waste management sub-sector

The developed methodology was applied to waste management sub-sector which enough data and information was collected. The methodology covers following steps:

- Step 1: to review related policies/plans,
- Step 2: to set reference scenarios,
- Step 3: to set NAMA targets, including calculation of GHG emission reduction potential,
- Step 4: to develop priority NAMA projects,
- Step 5: to establish MRV methodologies,
- Step 6: to identify financial resources, and
- Step 7: to consider schedule.

The imaginary figure of the 7 Steps methodology is shown in Figure-1 on next page.

Among identified priority NAMA project candidates, composting by YM Aerobes and semi-aerobic treatment system were agreed as reasonable candidates. Stakeholders in the host country would like to clarify potential of YM Aerobes to treat night soil in Bangkok, and pointed out that introducing incinerators are rather difficult and unrealistic because of objection by local communities as well as ineffective treatment fee system.

(i) Step 1: Reviewing related policies/plans and their progress in NAMA sector

Step 1 aims at understanding and assessing related policies/plans and their progress in the NAMA sector by examining existing national policies/plans/targets, and by reviewing the present situation of the sector.



Draft Methodology for Developing NAMA Plans and for Selecting Priority NAMA Projects

- Seven Steps for NAMA Planning -

STEP 1: Review related policies/plans and their progress in the NAMA sector

- Sub-step 1: Examine existing **national policies, plans, and targets** in the NAMA sector
- Sub-step 2: Understand/assess the **progress** of national policies/plan/targets in the NAMA sector based on existing data and information
- Sub-step 3: Understand the methodology to manage the national policies/plans/targets

STEP 2: Set reference scenarios in the NAMA sector

- Sub-step 1: **Identify barriers** to existing policies/plans/targets in the NAMA sector
- Sub-step 2: Set "**reference scenarios**" in the NAMA sector
- Sub-step 3: Consider **countermeasures** to address identified barriers in the NAMA sector

STEP 3: Set 'NAMA targets' in the NAMA sector

- Sub-step 1: **Identify main GHG emission sources** in the NAMA sector
- Sub-step 2: **Select practical GHG mitigation measures** in the NAMA sector
- Sub-step 3: Estimate **GHG emission reduction potential** by identified practical GHG mitigation measures in the NAMA sector
- Sub-step 4: Set "**NAMA Targets**" considering the possibility of realization of identified practical GHG mitigation measures in the NAMA sector

STEP 4: Develop priority NAMA projects in the NAMA sector

- Sub-step 1: Establish selection methodology of **priority NAMA projects**
- Sub-step 2: Collect priority NAMA project candidates from all over the country
- Sub-step 3: **Select priority NAMA projects** in the NAMA sector

STEP 5: Establish MRV methodologies for NAMA plans

NAMA Plan

STEP 6: Identify possible financial resources for implementing NAMA plans

STEP 7: Consider possible schedule for implementing NAMA plans

Figure-1: 7 Steps Methodology for NAMA planning

Under Sub-step 1-1, existing national policies/plans are examined to find the stipulations related to the NAMA sector such as waste management. In this FS, corresponding policies/plans were "10th National Economic and Social Development Plan" and "Action Plan of Pollution Control Department". Then the targets are extracted from such policies/plans. In addition, if local governments have their own policies/plans related to the NAMA sector, they are examined and the targets are extracted from them.

Under Sub-step 1-2, the data and information related to the NAMA sector are collected for



past 5-10 years in order to understand and assess the progress of the national policies/plans/targets in the sector. In this FS, the data and information at national level included past and present emission conditions of waste. In addition, if local governments have detailed data and information of the sector, the progress of their policies/plans/targets is assessed by using the detailed data and information.

Under Sub-step 1-3, how to manage the national policies/plans/targets should be understood in order to utilize it for developing MRV methodology of the NAMA plan (Step 5). The indicators of the targets, and reporting and verifying modalities and procedures are to be checked to manage them.

As the result of Step 1, followings are possibly identified, as an example.

- Existing policies/plans: “10th National Economic and Social Development Plan”, and “Action Plan of Pollution Control Department”, etc.
- Targets: Limit of waste production in urban area should be less than 1kg/person/day.
- Policy progress: More than 1kg/person/day in urban area; 53% of municipal solid waste (MSW) with improper disposal.

(ii) Step 2: Setting reference scenarios in NAMA sector

Step 2 aims at setting reference scenarios based on barrier analyses of existing policies/plans in the NAMA sector.

Under Sub-step 2-1, barriers to realize existing policies/plans/targets in the NAMA sector are identified, through the consideration of the results of Step 1.

Under Sub-step 2-2, the future trend of the identified barriers within 10-20 years is predicted, and then the ‘reference scenarios’ in the sector are set based on the result of the prediction. If the realization of the existing policies/plans is going well, the reference scenarios may be almost as same as the targets. In contrast, if the realization of it is very slow by critical barriers, the reference scenarios may be almost same as “Business-as-Usual (BaU)”. In this FS, the reference scenario to all activities such as “waste generation”, “waste collection and transport”, “waste treatment”, and “waste disposal” were tried to set.

Under Sub-step 2-3, possible countermeasures to address barriers in the sector identified through Sub-steps 2-1 and 2-2 are considered.

As the result of Step 2, followings are possibly identified, as an example.

- Identified barriers: Insufficient sanitary landfills, particularly those offering full disposal operations, etc.
- Predicted condition of barriers: Barriers will exist in long term due to difficulties to reuse and recycle food wastes, and many conflicts of interests among stakeholders, etc.
- Reference scenario: MSW amount increases; Capacity of landfill sites will be overflowed.
- Countermeasures: Introduce sanitary landfill sites with semi-aerobic treatment systems.

(iii) Step 3: Setting ‘NAMA Targets’ in the NAMA sector

Step 3 aims at setting ‘NAMA Targets’ based on the identification of main GHG emission sources and practical GHG mitigation measures in the NAMA sector.

Under Sub-step 3-1, main GHG emission sources in the NAMA sector are identified based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and other appropriate references. For instance, “CO₂ emissions from MSW collecting trucks” and “CH₄ emissions from landfill sites” are identified in this FS.

Under Sub-step 3-2, types of practical GHG mitigation measures in the NAMA sector are selected, according to the result of Sub-step 3-2. The measures can be classified into the following three categories, in this FS:

- Implementation of the countermeasures against the identified barriers directly reduces GHG emissions (quantitative reduction) (ex. Composting of MSW)
- Introduction of new and/or advanced technology directly reduces GHG emissions (quantitative reduction) (ex. Semi-aerobic landfill system)



- Implementation of the countermeasures against the identified barriers indirectly reduces GHG emissions (quantitative reduction) (ex. Increase of appropriate budget allocation for waste management systems in local communities, awareness raising, and education)

Under Sub-step 3-3, the potential of GHG emission reductions is roughly estimated within next 10 years by identified the practical GHG mitigation measures in the NAMA sector.

Under Sub-step 3-4, the ‘NAMA Targets’ are set, according to the result of the estimation of GHG emission reduction potential, considering the possibility of realization of identified practical GHG mitigation measures in the NAMA sector.

As the result of Step 3, followings are identified, and tentatively set as ‘NAMA Targets’, as an example.

- Identified GHG sources: CH₄ emissions from landfill sites
 - Practical GHG mitigation measures: Introduction and newly construction of semi-aerobic systems in sanitary landfill sites
 - GHG reduction potential (rough estimation): 2.8MtCO₂/year (nationwide)
 - NAMA Targets: 20 semi-aerobic system in existing sites, 30 (in small/mid cities) and 5 (in Bangkok) new semi-aerobic landfill site constructions
- ➔ Targeted emission reductions to be estimated at next phase of the FS

(iv) Step 4: Developing priority NAMA projects in the NAMA sector

Step 4 aims at developing priority NAMA projects by using selection methodology.

Under Sub-step 4-1, the selection methodology should be identified based on score formulation, such as the following table.

Evaluation items (tentative)	1	2	3	4	5	Weighting	Total	
1. Urgency			O			x 2	6	
2. GHG reduction					O	x 2	10	
3. Technological advantage					O	x 2	10	
4. Co-benefit effect					O	x 1	5	
5. Cost-benefit			O			x 1	3	
Total score								34

Under Sub-step 4-2, priority NAMA project candidates are collected, particularly in cooperation with the host country’s counterparts, by informing resource persons and stakeholders in the host country nationwide (especially from the capital city and other major municipalities) on this matter. The FS entity discussed this matter with resource persons from the Thailand Greenhouse Gas Management Office (TGO) and the Bangkok Metropolitan Administration (BMA).

Under Sub-step 4-3, priority NAMA projects in the NAMA sector are selected, by using the abovementioned selection methodology. In this FS, the priority NAMA projects were selected, and the resource persons from the TGO and the BMA confirmed their appropriateness.

As the result of Step 4, the introduction and newly construction of semi-aerobic systems in Bangkok, Chon Buri, and Nakhon Sri Tammarat are considered as the priority NAMA project candidates, in the NAMA sector.

(v) Step 5: Establishing methodologies of MRV for NAMA plan

Step 5 aims at establishing MRV methodologies for the NAMA Targets and the priority NAMA projects under the NAMA plan. Here the progress management methodologies (assumed as MRV methodologies) for comprehensive target in the sector (e.g., annual amount of waste per capita), and MRV methodologies for priority NAMA projects are established. As the former includes from data collection, recording to verifying modalities and procedures, the methodology considered at the Sub-step 1-3 (management methodology for national policies/plans/targets) is considered to evolve. For the latter, simplified MRV



methodologies for practical projects should be established, by referring to the approved CDM methodologies.

The FS entity developed the tentative MRV methodologies according to the CDM for the latter, although the former has been under discussion. For example, this FS entity proposes tentative MRV methodologies based on a CDM new methodology (NM0333) for semi-aerobic treatment of MSW.

(vi) Step 6: Identifying possible financial resources for implementing the NAMA plan

Step 6 aims at identifying financial planning for the NAMA plan including priority NAMA projects. Possible financial resources for priority NAMA projects may include own funds by host country's government and/or private entities, supports from developed countries and/or international financial organizations, and cooperation between private entities from the host country and other countries. Combining these options, appropriate utilization of financial resources for the NAMA sector and sub-sectors should be identified. In addition, the amount of GHG emission reduction compared to the reference scenario may be supplied to the bilateral mechanisms which Japanese government proposes.

The FS entity has proposed the utilization of PPP/PFI¹ financed by JBIC GREEN under the "bilateral crediting mechanism" between Japan and Thailand for the priority NAMA project candidates of the activities of "waste treatment" and "waste disposal".

(vii) Step 7: Considering possible schedule for implementing the NAMA plan

Step 7 aims at settling the schedule for the implementation of priority NAMA projects under the NAMA plan. Based on the result of Step 6 (financial plans for the priority NAMA projects), an appropriate schedule for the implementation of these projects, including whose feasibilities, is considered. In this FS, the schedule has been under discussion.

The exercises of Step 4 through Step 7 were made in this FS, but the result was still tentative. More detailed study is necessary.

For the wastewater management sub-sector, the necessary data and information was not collected in the 1st year of this FS. However, the abovementioned methodology should be applied in a similar way to identify appropriate and probable NAMA project candidates in the wastewater sub-sector in the near future.

(3) Calculations of GHG Emission Reductions

The FS report describes how to calculate GHG emission reductions through the implementation of the NAMA projects under the NAMA plan. Here one example how to calculate GHG emission reductions in the case of the introduction of a semi-aerobic treatment system is briefly explained, as a case study. First, the reference scenario has to be identified and set. According to the Pollution Control Department (PCD), MSW is expected to be appropriately treated – 50% of MSW by 2009, and 100% by 2017. Indeed, the status-quo is that only 37% of MSW is treated appropriately at sanitary landfill sites, and the rest (67%) is treated inappropriately, such as by means of open dumping or open burning. Bearing the budget or funding of the PCD and local municipalities in mind, it is difficult to imagine a scenario of newly construction of sanitary landfill sites promptly, under the condition that MSW increases accompanied with economy growth and population increase. Therefore, the scenario that MSW management remains as it is in a decade is set as a reference scenario.

Under the reference scenario, a countermeasure should be a semi-aerobic treatment technology, which flows fresh air into landfilled waste layers to avoid the anaerobic conditions in landfill sites, and to avoid the generation of methane gas. In addition, auxiliary benefits such as leachate quality improvement and smell reduction are found, which can be considered as "Co-benefits". In the CDM scheme, new methodology for semi-aerobic treatment of MSW was submitted, but it was rejected by the CDM Executive Board due to the existence of the problems regarding the monitoring of methane releases, the setting of factors in formulae, and the identification of exact amount of MSW. Since the IPCC Guidelines notice the effectiveness of the semi-aerobic treatment, the CDM scheme is quite

¹ PPP means "Public-Private Partnership", and PFI means "Private Finance Initiative"



tough to demonstrate everything in detail. Semi-aerobic treatment is clearly approved as one of effective GHG mitigation measures, only though it cannot approved as CDM projects.

The boundary of each NAMA project of semi-aerobic treatment should be within the landfill site because of no use and no generation of electricity.

Estimation of GHG emission reductions under the semi-aerobic treatment projects are based on the CDM methodological tool “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 05)”, and on the data of 100 landfill sites (including the year of construction and operation of each landfill sites, and the composition rates of MSW). The introduction of semi-aerobic treatment systems assumes to reduce half of methane generation. In a hypothetical case that semi-aerobic treatment systems are to be installed at all of 100 landfill sites in Thailand, the amount of GHG emission reductions are estimated as 4.8MtCO₂ during 10 years (2011-2020).

For monitoring of methane emissions and avoidances, it is quite difficult to measure accurately and directly methane gas emitted from landfill sites. The amount and composition of MSW is important, as well as the periodical direct measurement of methane concentrations is necessary to check whether the semi-aerobic conditions are formed or not. However, those methods are not feasible for costs and human resources. Therefore, more reasonable and simplified monitoring methods, and more reasonable and simplified MRV methods as well, should be considered. At a first step, the amount and the composition of MSW transported into landfill sites should be MRVed, and an adjustment factor can be set even if high uncertainty of the estimation of methane emission reductions could be predicted based on the FOD model.

Chapter II: FS on Transportation NAMA in Lao PDR – 1st year’s findings

implemented by Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.

(1) Outline of the FS

Economic growth of Lao PDR in recent years accompanied by rapid increase of traffic volume in the capital city of Vientiane has led to concerns over traffic congestion, increase in traffic accidents and air pollution. To address various issues arising from foreseen traffic congestion, the Lao government has developed the Environmentally Sustainable Transport (EST) Strategy as well as the Master Plan on Comprehensive Urban Transport of Vientiane to support bringing EST into reality. The Master Plan entails three basic plans consisting of 1) road network development plan, 2) public transport development plan, and 3) transport management plan. Targeting the Master Plan as a case study, this FS discusses the feasibility of the case study as an activity within NAMA through investigating GHG emission reduction effect and MRV feasibility among other aspects.

Target area:

The target area of the Master Plan and its evaluation is central part of Vientiane where population and traffic are concentrated. Therefore, this FS targets the same central Vientiane area which includes parts of Chanthabouly, Sisathanak, Sikhottabong, Xaysettha, Hatwayfong, and Xaythny Districts. The total area of the target area is 38,190ha which occupies 9.7% of Vientiane. The population of the area is 422,426 persons in 2005, which is 61% of the total population of Vientiane.



Project implementation period:

Projects in road network development, public transport development, and transport management sectors are planned to be implemented in 3 stages (short term (2008-2013), mid-term (2014-2018), and long-term (2019-2025)). A part of road surfacing, widening, maintenance and bus procurement are



expected to start by the end of 2011.

Targeting the Urban Transport Master Plan of Laos as a case study is also crucial in furthering the understanding of the following two issues and studying the expected potential of NAMA in addressing these issues.

A. Mitigation actions in the transport sector

According to reports by IEA, 23% of global CO₂ emissions are attributable to transport sector, and such emissions are rapidly increasing particularly in developing countries. As such, mitigation actions in the transport sector of developing countries are important and require urgent attention. On the other hand, data collection, monitoring, and quantification of GHG emissions in the transport sector are difficult. At the same time, due to reasons including relatively high initial investment costs considering the amount of emission reductions that can be expected, the transport sector has not benefited from climate change related funding mechanisms including the CDM. As such, the expectation held for NAMA is high and it is hoped that barriers in the CDM for the transport sector are clarified and a new framework is built on the lessons learnt from such issues.

B. Mitigation actions in LDCs

In reality, an LDC like Laos has a very low CO₂ emission level and emphasis placed on mitigation actions, as opposed to adaptation actions, are also small. In fact, urban transport condition in Laos fares well compared to neighboring countries in Asia. Nevertheless, it is clear that traffic volume will increase in the future due to rapid economic growth in recent years, population growth as well as increase in incoming traffic from Mekong region via East-West and North-South Economic Corridors taking advantage of the location of Laos bordering China, Thailand, and Vietnam. There is an emphasis on the leapfrog development shifting toward low-carbon society without repeating the mistakes of industrialized countries and emerging countries of Asia. When considering mitigation actions in the transport sector, it is not only important to improve technology to reduce emissions that have already increased, but it is also important to develop strategies and plans to prevent the increase of future traffic volume. Thus, it is crucial to establish preventive measures for future traffic increase in a country like Laos where CO₂ emissions are yet to escalate. To this end, there is a great expectation for the role the Master Plan and EST Action Plan could play. At the same time, significance of the case study is worth recognizing in terms of contribution NAMA can make to the leapfrog towards low carbon society.

GHG emission reduction by the Project:

Various GHG emissions reduction measures are available in the transport sector given the difference in the amount of GHG emissions reduction and whether the effect is direct or indirect. Some of the measures include improvement of fuel, fuel switching, and modal shift by increasing supply of public transport and traffic reduction by transport demand management. On the other hand, there is difficulty in quantification of GHG emissions reduction, data collection and monitoring of transport projects and relatively small amount of emissions reduction compared to the high initial investment cost.

At the same time, transport projects are expected to propel their full effect when multiple measures both hard and soft affect one another instead of a single project implemented independently. Therefore, the FS covers all activities with impacts on GHG emissions reductions, and studies their overall effect in order to grasp comprehensive effect of the Master Plan. GHG emission reductions of the comprehensive project are evaluated in terms of traffic volume (distance traveled by vehicles) in the target area, travel environment (travel speed) and emissions factor of vehicles.

Dissemination of the Project:

It is generally perceived that the CDM has not been able to contribute to facilitation of project development in the transport sector for difficulties in basic data collection, quantification of GHG emissions and monitoring. On the other hand, as 23% of global CO₂ emissions is said to come from the transport sector, mitigation measures in this sector are extremely important. In fact, out of 43 countries that have submitted NAMAs based on the Copenhagen Accord, 18 countries have stated intentions to engage in actions in the transport sector signifying the high level of interest in GHG



emission mitigation in this sector.

If the framework design for NAMA in the transport sector that supports transport policy and the implementation of the Master Plan, the estimation method of GHG emission reductions and feasibility of MRV can be demonstrated through the case study, similar actions in other cities of Laos, where traffic volume increase is feared in the future as in Vientiane. Also, wider dissemination can be expected to many countries that are proposing transport sector actions in their NAMAs in addition to neighboring Asian cities facing various transport and environmental issues due to high motorization rate caused by rapid economic growth and urbanization, such as Bangkok, Jakarta, Ho Chi Minh City and Hanoi.

(2) Determination of Reference Scenario

At the 13th session of the AWG-LCA, it was agreed that “developing country Parties will take nationally appropriate mitigation actions in the context of sustainable development, supported and enabled by technology, financing and capacity-building, aimed at achieving a deviation in emissions relative to ‘business as usual’ emissions in 2020 “. As such, the reference scenario of NAMA is determined as the level of BAU. In other words, GHG emissions that would occur in the absence of the projects planned under the Master Plan are deemed to form the reference level, especially in LDC like Laos where the implementation of the Master Plan requires support from other countries and is not considered as BAU.

Even though the traffic condition in Vientiane currently fares well compared to other capital cities of Asia, the number of motor vehicles and traffic volume are rapidly escalating due to the recent population and economic growth. The real GDP growth rate of Laos between 1999 and 2009 is 7.8% which is the second highest in ASEAN after Cambodia (9.2%). At the same time, as the 7th National Socio-Economic Development Plan, 2011-2015 indicates, the Government places average GDP growth target between 2010 and 2015 at 8.0%.

As GDP and car ownership have positive correlation, it is expected that car ownership rate will rise in Laos with increase of household income aided by GDP growth. Difficulty in setting the reference scenario is what kind of measures will be implemented at the BAU level given the growing car and motorcycle ownership brought by population and economic growth.

One method to address the issue is reflecting historical changes of transport activities within the Target area. However, due to the lack of data on historical traffic volume or traffic condition in Laos, it is not possible to analyze historical trend. For the case study, the result of origin-destination (OD) survey of the target area as well as traffic survey which were conducted in 2007 was used; therefore, by conducting the same surveys again before starting the NAMA period, historical changes of transport activities can be clarified. Such historical changes should reflect impacts of road network development and other transport related projects within the target area. BAU should be changes in GHG emission levels based on traffic demand estimation that reflects historical trend.

The FS refers to future traffic demand estimated according to the OD survey and traffic volume survey conducted in 2007 as BAU. As these surveys require cost and know-how, funding and technical assistance from developed countries would be important.

In general, transport projects are more effective when the synergy of several projects can be generated as opposed to implementing a single project. For example, BRT² project would be more effective if implemented together with priority lane development, improvement of transfer convenience and competitive pricing system with cars and motorcycles. Feeder route development and park-and-ride facilities may also be needed for making BRT effective. As the examples indicate, it is important to implement BRT project within the package of a comprehensive transport project. Combination of hard and soft measures and complementarity of long term and short term plans are needed for planning a transport project.

The FS has looked into the GHG emission reduction potential of all activities planned under the Master Plan. If MRV of the comprehensive effect can be implemented, the synergy of planned activities can be grasped. By regularly verifying such comprehensive effect, it is expected to check any discrepancy between what is planned and what is actually happening and adjust the plan so the long-term objective can be achieved. By targeting comprehensive activities within the boundary, it is

² BRT means “Bus Rapid Transit”.



possible to facilitate comprehensive and efficient plans and to incorporate GHG emissions and their environmental impact from the planning stage. Thus, studies were carried out on GHG emission reductions and monitoring among other aspects for the target area of the Master Plan.

(3) Estimation of GHG Emissions Reduction

(i) Method of GHG emission reduction estimation:

There are two main methods for estimating GHG emissions in the transport sector; “top-down” method based on fuel consumption and “bottom-up” method based on traffic volume. The “top-down” approach is the one adopted in National GHG inventories. It is relatively simple as only fuel consumption data are needed. It is suitable for measures on alternative fuel or vehicles themselves, but is not capable of properly assessing the impact of changes in transport activities. On the other hand, the “bottom-up” approach requires many data as it utilizes traffic volume, road network and emissions factor of vehicles, however, it is able to incorporate changes in transport activities. The “bottom-up” approach is therefore deemed appropriate to evaluate the Master Plan that accompanies measures on traffic volume and traffic flow.

ASIF (The activity-structure-intensity-fuel) is generally used as a method of carrying out the “bottom-up” approach. GHG emissions in the transport sector (G) can be derived from transport activity (A), modal share (S), fuel intensity of each mode (I) and emission factor (F) as described in the following equation.

$$G = A * S_i * I_i * F_{i,j}$$

Where,

G : CO2 Emissions from transport (ton CO2)

A : Transport activity (person-km traveled, vehicle-km traveled, ton-km transported for freight)

S : Modal share

I : Fuel intensity (liter/person-km traveled)

F : Carbon content of fuel or emission factor (ton C or ton CO2 per liter)

I : Transport mode

J : Fuel type

The FS utilized a method of estimating CO2 emissions reflecting traffic volume by vehicle type, travel speed and emission factor by speed for each segment derived from traffic volume forecast based on ASIF approach.

(ii) Traffic volume forecast

Total traffic volume expressed as vehicle-km traveled is calculated using the 4-step estimation method and then used in GHG emissions estimate for reference and ex-ante project scenario. The 4-step method is the most recognized method for transport demand forecasting which is crucial in planning and proposing investment strategies in the transport sector. Transport demand forecasting is conducted by simulating transport system supply and using socio-economic data.

In the case study, future transport demand is forecasted in accordance with the 4-step method based on the OD chart obtained from the person trip survey of 2007 and road network and socioeconomic data. Table-1 demonstrates transport demand of 2025 forecasted for BAU, the scenario with road network development under the Master Plan and the scenario with road network development and bus development.



Table-1: Transport demand forecast by scenario in 2025

Scenario	Motorcycle	Passenger car	Tuk-tuk	Bus	Truck
BAU	8,901,243	3,331,593	43,452	148,244	466,455
Road network development	8,570,579	3,192,499	41,073	139,685	428,601
Bus development	3,427,334	2,422,417	67,480	203,327	413,425

Unit: vehicle-km traveled/day

Source: JICA, The Study of Master Plan on Comprehensive Urban Transport in Vientiane in Lao PDR, 2008

(iii) Vehicle emission factor

It is suitable to use traffic volume by segment and emission factor by vehicle type and average speed as road congestion levels change according to policy implementation and traffic volume. As the vehicle emission factor is dependent on vehicle type, engine type and driving patterns, it is necessary to use country-specific emission factor in order to accurately calculate emission of that country. However, in developing countries, availability of emission factor data is very limited due to the requirement for vehicle exhaust gas testing facilities and various know-hows for the development of vehicle emission factors.

As Laos has not developed vehicle emission factors to date, vehicle emissions factors mainly measured in Bangkok, Thailand were utilized in the FS.

(iv) GHG emission reductions

As only preliminary calculation is conducted in the FS, emissions levels for each scenario in 2025 have been forecasted using only vehicle-km traveled by vehicle type and vehicle emission factor for average speed.

Table-2: CO2 emissions for each scenario in 2025

Scenario	Motorcycle	Passenger car	Tuk-tuk	Bus	Truck	Total	Emissions reduction
BAU	177,068	202,104	4,758	60,873	171,959	616,762	0
Road network development	170,490	193,667	4,497	57,358	158,004	584,016	32,746
Bus development	68,178	146,951	7,389	83,491	152,409	458,419	158,343

Unit: t-CO2/year

Figure-2 shows the calculation result of CO2 emissions for each scenario. Approximately 370,000t-CO2 will be reduced between 2013 and 2020 from BAU level due to the implementation of road network development and bus development.

(4) Monitoring Method and Plan

GHG emission estimation using the bottom-up approach has various merits as previously described; however, it also requires collection of extensive transport-related data which is not normally tallied in many developing countries. Many of these data require costs, manpower and technical assistance from industrialized countries. In fact, the lack of available data is one of the factors that hindered transport project development in the CDM. The level of rigor in evaluating GHG emission reductions may be different according to whether NAMA is unilateral, supported or credit-generating. Items to be monitored, monitoring frequency and scope need also be considered taking into account the level of assistance from industrialized countries.

The FS has looked into the monitoring items, divided into two: the monitoring of the reference emissions and the monitoring of the project emissions. Reference emissions will be estimated using transport demand forecast, however, adjustments will be made between forecasted data and measured data. Socioeconomic data as well as cross-section traffic volume and travel speed at major road segments will be monitored for adjustment.



Collecting these data is crucial in developing low-carbon growth and urban planning strategies and evaluating such strategies in developing countries. Therefore, it is important to conduct surveys, provide funding for data collection, technical assistance and capacity building as part of NAMAs. It is also worth considering the frequency and scope of survey required or the utilization of default values depending on the level of assistance from industrialized countries.

At the same time, it is important to develop a robust organizational structure for monitoring implementation in a continuous and proper manner. Capacity building is expected to be provided with industrialized countries' assistance to develop the following functional framework.

- Developing a manual indicating method of carrying out OD and traffic volume surveys and their frequency.
- Developing a database to properly record and manage data.
- Developing a structured monitoring organization that clarifies responsible departments and personnel for monitoring, data recording and management.
- Determination of personnel in charge of QA/QC within the above organization for managing the quality of monitoring method and collected data.
- Developing a manual for data recording, management and QA/QC.

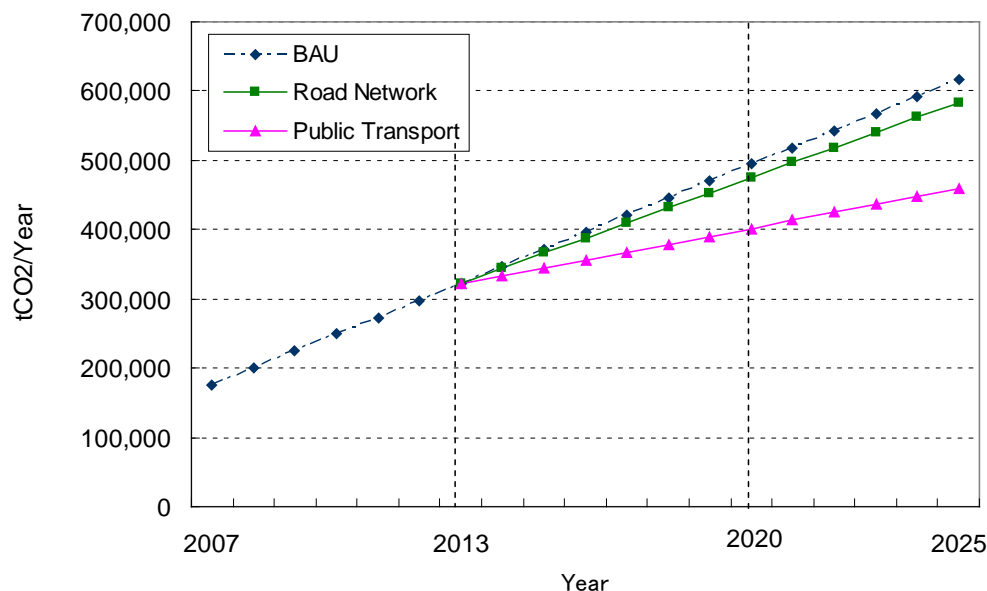


Figure-2: Trend in CO₂ emissions by scenario

(5) Monitoring, Reporting and Verification (MRV) method:

Although MRV has become a hot issue as it concerns ways in which transparency is secured for mitigation actions of developing countries, details are not yet clear. Nevertheless, some specifics have become clear in the COP 16 agreement where development of a guideline was decided.

In order for transport sector NAMA to be effective in mitigation overcome barriers faced in the CDM, it is important that MRV for NAMA is developed into a reasonable framework that is feasible in developing countries and the balance of rigor and cost is maintained. In this FS, therefore, MRV methods are considered according to the procedures of ISO 14064-2. Factors of MRV to be considered are summarized below.

(i) Measurement (M):

In the case study, GHG emissions in the reference scenario and the project scenario are quantified based on transport activities and emission factor using ASIF approach. Assumed uncertainty factors and how they can be addressed have been studied as follows.

a) Ex-ante determination of the reference scenario:

Issue: The reference scenario is determined as BAU which is the scenario reflecting traffic



volume trend between 2007 and project start. The scenario is pre-determined based on transport demand forecast surveys conducted prior to the project implementation. After the project implementation, the reference scenario cannot be actually monitored as road network and urban structure change.

Response: The input data, such as population, socioeconomic data and transport demand forecast that can be monitored will be updated and used for re-forecasting. Also, cross-section traffic volume and travel speed at major road segments will be monitored and their comparison with forecasted data will be used to adjust the reference emissions. These actions will decrease the level of uncertainty.

b) Uncertainty due to the utilization of transport demand forecasting model:

Issue: Transport demand forecasting modeling is used for estimation of traffic volume under the reference and project scenarios. As far as the utilization of a modeling is concerned, there are concerns over uncertainty as what happens within the model becomes unclear and much control is in the hands of the operator of the model.

Response: The following 4 measures can be implemented to address the issue of uncertainty in utilizing transport modeling.

1) Application of a robust model

JICA-STRADA was used for the Master Plan of Vientiane in Laos, and therefore continues to be used for the FS. JICA-STRADA has been used in many cases of JICA's technology assistance projects in transport planning sector of developing countries.

2) Verification of the model

Comparison analysis of estimated data and measured data has been conducted when establishing a model. It is important that such analysis results are reported and verified by a third party to secure transparency of measurement methods in modeling.

3) Comparison analysis of measured data

Using measured data for the project scenario enables collection of more accurate data on transport activities. Uncertainty can also be adjusted for the reference scenario by comparing estimates with measured data and by regular adjustment and verification.

4) Sensitivity analysis

When high uncertainty is expected for data, such as population forecast that underlies the transport demand forecast, sensitivity analysis should be conducted. Conservativeness can be maintained by adopting the least emissions when applied to the reference scenario and the highest emissions when applied to the project scenario.

c) Accuracy of GHG emission factor:

Vehicle emission factors have not been developed in many developing countries as they require various know-hows. Nevertheless, in order to raise the accuracy level of emissions calculation and to properly evaluate impact of mitigation measures, it is important to support the development of vehicle emission factors by vehicle type and speed in Laos.

(ii) Reporting (R):

It is deemed appropriate that pre-project reporting is conducted in a form of document, such as CDM-PDD while post-project reporting is conducted by submitting a monitoring report containing monitoring outcome. Implementation framework of monitoring requires further discussion.

(iii) Verification (V):

Verification contains factors of both validation and verification. It is desirable to follow the CDM process where validation confirming the project validity is implemented at the time of pre-project reporting and verification is implemented at the time of post-project monitoring.



However, standards of validation and verification are not decided and are subject to further discussion. At the same time, the suitable types of organizations to conduct verification calls for careful consideration.

(6) Financial Plan

Regarding the project cost required for the implementation of the Master Plan, foreign aid is planned to be used to fill in the gap between the required funding and Lao government's own available fund. As such, financial aid, such as ODA from Japan and other aids from international agencies and other countries continue to play a major role in implementing the Project. Nevertheless, implementation of the Master Plan as NAMA is desired contribute to fund procurement by attracting climate change funding as well as additional funding from industrialized countries. As for activities that can generate profit, such as bus operation, NAMA and other climate change related funding can be used as subsidy or they can act as an insurance to attract private investment and technology transfer.

(7) Toward Implementation

Implementation of the Master Plan is under preparation with assistance from JICA and other international organizations. Nevertheless, whether it will be implemented according to the plan depends on further assistance from overseas. In order to maximize the effect of the measures under the Master Plan, it is necessary to verify the comprehensive effect. To this end, a great expectation is held for the role NAMA could play.

It is deemed that ODA is necessary for the implementation of the projects planned under the Master Plan. Moreover, in order to implement the projects as part of NAMA, various surveys and data collection as well as technical assistance are needed. It is important that such assistance is provided as part of supported NAMA. Together with developing the implementation plan with utilization of ODA, it is important to prepare fund required for implementing the projects as NAMA as well clarifying required technical assistance.

As transport projects can be last over several decades, it is important that long term urban and transport plans are developed beyond 2020. Studying the feasibility of the projects by separating them into mid-term and long-term plans and feasibility is important in maximizing the role of NAMA in the long-term development plan.

Chapter III: FS on Sustainable Peatland Management in Indonesia under NAMAs – 1st year's findings

implemented by Shimizu Corporation

(1) Outline of the FS

(i) Overview of the action/project:

- Host country: Republic of Indonesia
- Project site: Irrigated land in the East Tanjung Jabung regency of Jambi, Sumatra, covering an area of approximately 10,000 ha (see Figure-3)
- Project objectives:
 - To raise water table in the project area by installing water gates, etc. and improving management of existing water gates
 - To suppress aerobic decomposition of peat and limit CO₂ emissions by raising water table in the peat layer (see Figure-4)
 - To enable dual or double cropping by raising water table and increase yield



Figure-3: Map of the project site



- per crop, thereby contributing to sustainable development of the host region
- Project implementers: It is envisaged that implementation of the project will be funded by a consortium (including Shimizu Corporation) under a bilateral agreement between Japan and Indonesia to reduce GHG emissions.
 - Term of project: Envisaged to be a 10-year period beginning in 2015

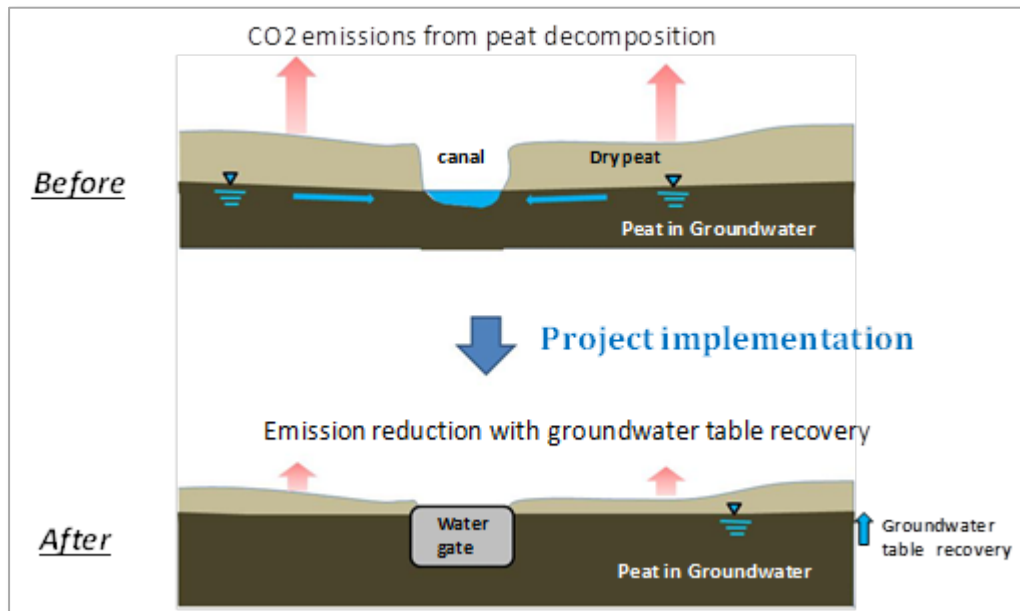


Figure-4: Reduction of CO2 emissions through recovery of water table in peat

(ii) Contribution of the project to reduction of GHG emissions:

Water gates will be operated to allow tidal zone river water onto the site to raise and keep water table there at a certain level. Raising water table will inhibit aerobic decomposition of peat by microorganisms, thereby enabling peat CO2 emissions to be reduced.

(iii) Studied topics:

In this FS, following topics are mainly to be addressed.

- Compilation of information on Indonesian government policy on peat management and state of its implementation
- Indonesia's biomass of peat
- Methodology regarding peat CO2 emissions
- Estimation of CO2 emissions due to peat decomposition
- Monitoring of CO2 emissions due to peat decomposition
- Preliminary survey of the site

(2) Development of Reference Scenario

The opinion of the National Council on Climate Change, Indonesia (NCCCCI), as the DNA in Indonesia, on the development of a reference scenario is shown in the Figure-5 below.

The reference level (RL) as of September 2010 was indicated as being the financed NAMAs line in the diagram, and the scenario obtained by adding the financed NAMAs portion at the 15% reduction level to unilateral NAMAs of up 26% from BAU in 2010 is considered the reference scenario. (In this case, any reduction in excess of the RL is assumed to be available for trading as tradable NAMAs.)

While such an interpretation of the RL is conceivable given that action to reduce emissions through peat management represents a key element of Indonesian NAMAs, this would mean that a considerable portion of the emission reductions actually achieved as a result of the project would not be convertible to credits, thus significantly lowering the incentive to implement it.



The diagram depicts the position on Indonesian NAMAs as a whole, and it remains to be determined whether this approach to reducing emissions through peatland management will be adhered to. Particular consideration should be paid to the position at the national level when developing rules for its application to the project level. Possibly reflecting such consideration, the RL in the diagram as of February 2011 has been changed to represent the BAU line, and the RL in the project's case (i.e., the base scenario) may be regarded as being BAU.

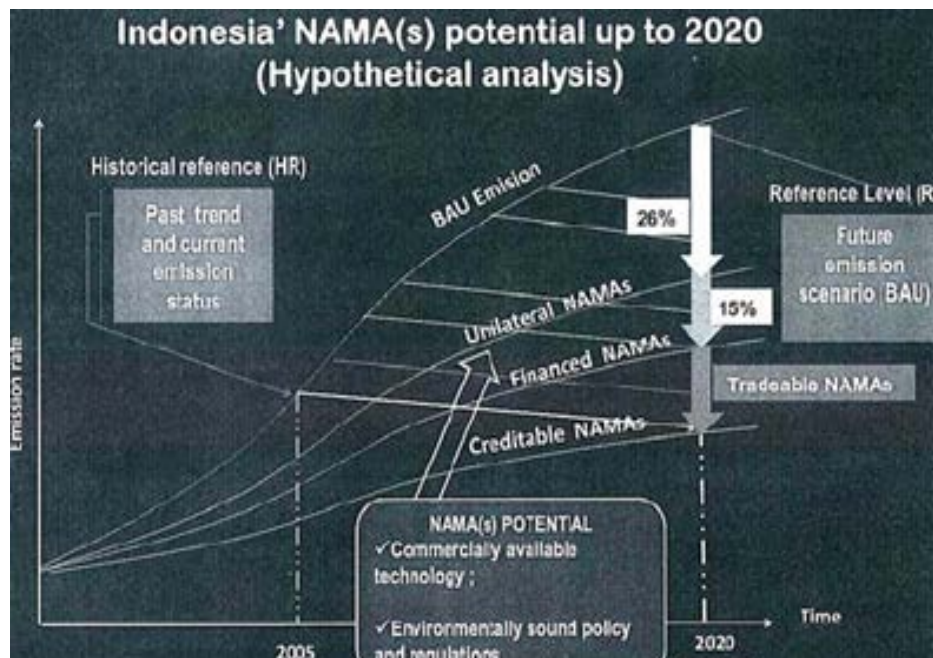


Figure-5: Proposed role of mitigation actions in Indonesia (February 2011, NCCCI)

As regards the present state of peatland, peat destruction due mainly to slash-and-burn agriculture and development is expected to be considerable, thus resulting in increased emissions of GHGs, if the project does not take place. The reference scenario should preferably therefore be based on the maintenance of the status quo; in other words, on water table management not being practiced.

(3) Monitoring Method and Plan

(i) Method of calculation of CO₂ emissions from aerobic decomposition:

GHG emissions covered by the project will be calculated based on the following approach. As the site concerned consists of irrigated land where fires do not occur, CO₂ emissions from peat burning are not included.

- a) Aerobic decomposition of peat occurs caused by drainage from manmade canals in peatland, leading to emission of CO₂.
- b) The relation between CO₂ and drainage depth is given by the following expression, which is applicable to drainage depths of 0.5-1 m in Southeast Asia (Hooijer et al., 2006): 91t-CO₂/ha/year per m of drainage depth in peatland, as seen in Figure-6. More conservative rate of its half 45.5t-CO₂/ha/year is adopted in this FS. The conservative approach is also found in the NCCCI document (2010: Indonesia's Greenhouse Gas Abatement Cost Curve).
- c) Drainage depth in the peat layer (i.e., the water table level) therefore needs to be monitored. Water table is measured in each sub-area in which water table in peat may be regarded as being largely constant.
- d) The peat biomass in a given sub-area will be initially measured.

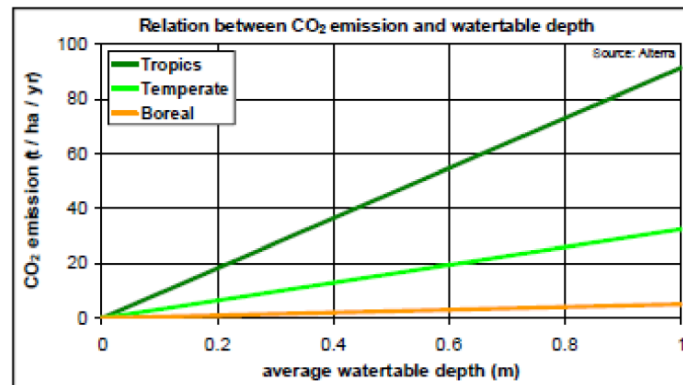


Figure-6: Relation between water table depth and CO2 emissions (Hooijer et al., 2006)

(ii) Monitoring method:

Water table will be continuously measured in each sub-area in which the water table can be assumed to be largely constant. The biomass of peat carbon will similarly be measured in each sub-area before implementation of the project.

(iii) Ensuring reliability on monitoring scale:

As water table and peat carbon will be measured at around one point per sub-area, there may arise question marks over whether the area data obtained are necessary and sufficient to ensure their reliability. A quantitative analysis will therefore be made of changes in water table at the project site by means of water table simulation in order to demonstrate that the number of water table measurements is sufficient to allow for area topographical and geological changes.

For reference:

One technique applicable to monitoring peat water table over a wide area is estimation of water table by satellite, research on which is currently being pursued (Takeuchi et al., 2011). The results of actual measurements on Kalimantan have been compared with estimates there, and it is expected that the technique will enable the estimation of water table of a wide area.

(4) Estimation of GHG emission reductions

(i) Estimation method of GHG reductions (ex-ante):

The above mentioned relation between the average water table depth and CO2 emissions with the conservative approach of 45.5t-CO2/ha/year is adopted in this FS.

Conditions of emission reduction calculation:

- 1) Project site area: 10,000 ha
- 2) Average rise in drainage depth: Increase of 0.5 m (from -0.9 m to -0.4 m)

Calculation results (ex-ante):

$$45.5 \text{ t-CO}_2/\text{ha/year} \times 10,000 \text{ ha} \times 0.5\text{m} = 227,500 \text{ t-CO}_2/\text{year}$$

(ii) Measurement (ex-post):

1) Quantification of reduction of CO2 emission using observed drainage depth

- (a) Let an area where water table may be assumed to be constant to be a hydrologically homogeneous sub-area A_i . Water table is measured at one location in this sub-area, and the result becomes the sub-area's average water table.
- (b) This hydrologically homogeneous sub-area is continuous with other sub-areas in the project area, and the total area $\sum A_i$ ($i=1, k$) equals the project area, where k is the number of sub-areas.
- (c) Before implementation of the project, the water table in each sub-area A_i is measured continuously for one year, and its average becomes the initial water table (this is a water table in the case that the project is not implemented).
- (d) Similar measurements will be made on irrigated land outside the project area to provide reference values. Measurements will continue to be made at these reference points after



implementation of the project as well. To account for annual variations, the initial values will be corrected using these reference values. The reliability of corrections will be ensured by taking into account data of precipitation.

- (e) During the course of the project, continuous measurements will be made of the water table in each sub-area A_i , and the difference between the yearly average and the corrected initial value will be considered the rise in water table due to the project ΔGWT_i ($i=1, k$), in meter units.
- (f) From this ΔGWT_i , the reduction in CO₂ emission due to suppression of peat decomposition in each sub-area A_i will be calculated by the following equation (see Figure-7):
- $$\Delta CO_{2, \text{reduced}, I} = 45.5 \text{t-CO}_2/\text{ha/year} \times A_i \times \Delta GWT_i$$
- (g) Accordingly, the total reduction in CO₂ emissions in the project area may be obtained by the following:
- $$\Sigma 45.5 \text{t-CO}_2/\text{ha/year} \times A_i \times \Delta GWT_i \quad (i=1, k)$$

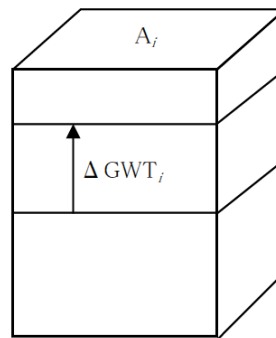


Figure-7: Estimation of CO₂ emission reductions in each sub-area due to recovery of water table

2) Assessment of initial peat stock based on measurement of amount of peat carbon

- Peat samples will be taken in each sub-area by hand auger. The amount of carbon will then be calculated from their volumes and carbon concentrations (gC/cm^3), and the result used as the initial peat stock in the sub-area. Carbon concentration will be determined using the method described by Shimada et al. (2001).
- Let the initial amount of carbon in each sub-area be $C_{0,i}$ (t-C/ha), then the amount of CO₂ that would be generated if it were to be entirely aerobically decomposed would be $C_{0,i} \times 44/12$ (t-CO₂/ha).
- This represents the maximum amount of CO₂ in each sub-area whose emission can be reduced by implementation of the project. It is thus possible to avoid calculating an emission reduction that would exceed the actual amount of carbon present.

(5) Methods of Measurement, Reporting, and Verification (MRV)

(i) Project level MRV:

Below we consider MRV in the case that the project is implemented, as assumed for this FS, as a “project to reduce GHG emissions from peat by raising water table on irrigated farmland” under a bilateral scheme.

(a) Measurement method:

The CO₂ generated by aerobic decomposition would be calculated as described in (4)(ii) above. The data of drainage depth required for these calculations would be measured continuously using water level sensors.

The approach used places an upper limit on the amount of emission of CO₂ that can be reduced through restoration of water table to prevent the resulting figure from exceeding the amount of CO₂ that would be generated by decomposition of all peat present. This ensures that the reduction claimed for the project is not greater than the actual amount of carbon present.



(b) MRV cycle:

The principal bodies presently approving GHG reduction projects and issuing carbon credits are the UNFCCC, J-VER and the Voluntary Carbon Standard (VCS), and the last two of which issue credits on a voluntary basis. Below we briefly describe the main features of each.

- UNFCCC: It provides the CDM to enable projects to be implemented by developing countries with funding and technical assistance from developed countries in accordance with UN rules, and 270 million tons of credits had been issued under it as of December 31, 2010. Although NM0297 was put forward as a methodology for handling peat emissions, this was rejected and there is not at present any approved methodology. Hooijer et al. (2006) serves as a reference for the calculation of CO₂ emissions from dry peat by the IPCC.
- J-VER: This is a scheme for certifying projects as highly reliable “carbon offset credit” projects and issuing credits by confirming and verifying their validity under the carbon offset credit (J-VER) scheme. The emission reductions verifiable under the scheme are reductions and sinks arising from voluntary GHG mitigation and sink projects undertaken in Japan.
- VCS: This seeks to provide a global standard for voluntary carbon offsets. February 2011 saw the issuance of the first 1.16 million tons of voluntary carbon units (VCUs) under REDD. Although an approved methodology covering peat fire and decomposition does exist (VM0004), this is limited to land subject to concessions and so is not applicable to the present project. The VCS aims to add the peat rewetting and conservation category to its methodologies in 2011, and public comment was sought in 2010 (<http://www.v-c-s.org/news.html>).

While the question of which framework to adopt for issuing credits under a bilateral scheme must remain one for future consideration, the main steps in the process of emission reductions crediting are likely to be as follows.

(ii) Main steps in MRV cycle:

- Application to approving body for approval of methodology (if no methodology exists)
- Submission of project implementation document using an approved methodology
- Validation of the project
- Measurement and monitoring (Measurable)
- Submission of monitoring report on emission reductions (Reportable)
- Verification by validating body (Verifiable)
- Issuance of credits by approving body

(6) Funding Plans

It is estimated that the following funding will be required for implementation of the project in the anticipated project area (covering approximately 10,000 ha for 10 years). Financing is likely to require not only private finance premised on revenue from the sale of credits, but also the direct injection of public funds by the Japanese government, and the injection of funds by the Indonesian government covered by lending received by it.

It is estimated that the project will generate about 230,000 tons per year of credits. Given the cost of expenditures on items such as operation and maintenance, payback will require more than 10 years relying on income from credits alone. Considering the risks surrounding credit arrangements under the new flexible mechanisms, the length of the payback period means that private finance by itself will be insufficient, and public funds from developed countries will be essential.

As the increased agricultural yield made possible by action under the project will be of benefit to the local farmers, it will be important to also take into consideration funding contributed by the Indonesian government.



Items	Preliminary estimation of expenditure
Water gate and canal maintenance with bypass filling	2 million USD (200 gates and canals x @10,000USD)
Water level monitoring	10 million USD (5,000 locations x @2,000USD)
Other monitoring and pumps, etc.	3 million USD
Total	15 million USD

(7) Likelihood of Implementation

Reduction of GHG emissions from Indonesian peatland is presently attracting interest from countries around the world, and various programmes for its mitigation has been initiated with funding from countries including Norway, Japan, Australia, the Netherlands, and the United States of America.

There are numerous uncertainties on the institutional side that must be considered if the project is to be led by the private sector, including the handling of credits under new flexible mechanisms, progress on the development of a bilateral framework between Japan and Indonesia, and the position of peat management projects under REDD.

As the design of these arrangements is likely to take several years, it is important to adopt a “thinking by doing” approach of designing arrangements while implementing actual projects.

For the time being (FY 2011-2012), therefore, it is essential to proceed by implementing pilot projects with Japanese government assistance, so as to develop know-how and analyze risks on the technical as well as institutional side for application in subsequent actual projects.

Of the possible areas, the proposed project area is comparatively served by water gates and waterways, making it an area where the technical barriers to implementation are low. The biggest obstacle to the project’s implementation is therefore institutional. Provided that the necessary arrangements can be put in place, therefore, there is a high likelihood that the project actions can be implemented.



Conclusion & Future Prospect

In FY2010, three FS were conducted mentioned from Chapters I to III. Each FS focused on a different sector and a different host country, and made a different approach for calculating/estimating GHG emission reductions and establishing MRV methods. According to these three FS, it was desirable that new mechanisms could flexibly reflect specific circumstances in each host country. In this context, the low-carbon sustainable development should be realized based on the mutual understanding between an industrialized country and a host country.

Japan has proposed a bilateral mechanism which can promote the transfer and dissemination of low carbon technologies, products and services to developing countries, and can estimate the effectiveness of GHG reductions in a proper way. It can also reflect national circumstances in both two countries.

However, at present, more and more intensive case studies are needed to establish a robust new mechanism toward the post-2012 regime. It is quite essential that we will continue to accumulate experiences, knowledge and know-how based on case studies in developing countries in order to realize and promote GHG mitigation projects/activities under the bilateral mechanism.

Therefore, the MOEJ has decided to expand its new mechanism FS programme in FY2011. It is expected that nearly 30 FS will be implemented as case studies in various sectors/activities including NAMAs and REDD+. These FS will be officially selected and started in July 2011.

We hope that these FS will contribute to deepen understandings among developing countries and to lead concrete actions for low carbon planet.

The reports of FS 2010 are available through GEC website:

http://gec.jp/main.nsf/en/Activities-Climate_Change_Mitigation-nmfsrepDB-List

