



# Mekong Region Waste Refinery-International Partnership towards Achieving Zero Waste, Zero Landfill and Reduce Greenhouse Gas Emission Project

3<sup>rd</sup> High Level Seminar on Environmentally Sustainable Cities

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**Dr. Muhammad Abu Yusuf**

**Project Director**

**Mekong Region Waste Refinery-International Partnership Project**

**Asian Institute of Technology, Thailand**



# Background , Rationale, Objective and Purposes

- **Project Background and Rationale:**

Rapid Development in the region, rapid urbanization, Waste volume doubled in 10 years, find place for dumpsite is difficult- land price increase and no one want dumpsite in their back yard (NIMBY) , huge amount of waste is unmanageable by the cities, thus zero waste, zero landfill and reduce greenhouse gas emission advocating by this project

- **Overall Objective:**

Improved knowledge on Technology and Technological know-how to reduce solid waste origin greenhouse gas emission in the Mekong region and motivated to transfer of technology in the region

- **Project Purposes:**

To improve understanding on the importance of zero waste, zero landfill and reduction of waste origin green house gas emission and leading role in its implementation in the Mekong Region

# Outputs

- **Output 1:** Feasibility Study Report, identified dumpsites to install anaerobic digester to convert waste/biomass to biogas or trap the gas from the dumpsite and gas micro-turbine to convert biogas to electricity or provision of pour gases in cylinder to use for cooking.
- **Output 2:** Relevant stakeholder's capacity developed
- **Output 3:** Developed/strengthened partnership among different stakeholders in the region and Sweden.
- **Output 4:** Cities in the region lead in the waste origin greenhouse gas reduction initiatives (through introduction of 3R, zero waste and zero dumpsite concept)

# Main Activities

- **Conduct feasibility study** to identify the dumpsites to install an aerobic digester to convert biodegradable waste to biogas or trap gas from the dumpsites and gas micro-turbine to convert biogas to electricity in Phnom Penh, Cambodia and Vientiane Capital, Lao PDR
- **Arrange study visit** for City Mayor, senior city officials and relevant stakeholders to visit waste refinery in Boras City, Sweden to learn how Boras city is managing waste through practicing zero landfill concept
- **Conduct Technical Training** on waste to biogas and biogas to electricity Technology and Technological know-how for technical staff of city offices from the 4 cities 4 Mekong region countries

## Main Activities (Cont'd)

- **Organize training courses/workshops** on sustainable management of solid (3R initiatives), waste refinery, waste to biogas and biogas to electricity for relevant stakeholders of Mekong region
- **Implement demonstration project** on waste to Biogas generation and uses it for cooking/energy generation in Phnom Penh, Cambodia and Vientiane Capital, Lao PDR
- **Organise Project Launching meeting** at the beginning of project
- **Conduct dissemination seminar/meeting**

# Cross-Cutting Issue

- Gender equality
- environment

# Risk Analysis

RISK	MITIGATION MEASURES
Cultural variation and language barrier	Local partners will be involved in the project; participants of events interact in local language, and translation provision in meeting/workshop
Project implementation and organizing event delay due to natural calamities, outbreak of pandemic and political problem	Project implementation plan will be prepared in such a way that time leverage will be kept, thus project can be completed on time and shift the event if needed.
Lack of political commitment after change of city politician/Mayor	The officials from city will be included in the training/study tour, thus after change of political regime, the city official will continue to pursue the activity
Resignation of trained technical staff from the job	The technical staff can train 1/2 local staff about the technology and technological know-how, & draft a manual, thus trained staff can take over the responsibility if the technical staff resigned.

# Sustainability and Up-scaling

- **The capacity of the different stakeholders in the region will be developed by improving knowledge, technology & technological know-how exposure, city mayor and officials will support to zero waste, zero landfill & reduce greenhouse gas emission initiatives, & motivate other to initiate such programme.**
- **In the next phase, plant can be installed/tested in selected sites, city officials those attend technical training will be able to manage plants by themselves.**
- **Mayor, officials and relevant stakeholders those capacities developed through involvement of this project will advocate promoting this technology throughout the region.**



# INNOVATION, LEARNING AND DISSEMINATION

- Mekong region and Swedish solid waste management exposure of Swedish expert and Mekong region city officials will understand to adapt the technology in the local context.
- The new lesson learned can be disseminated in both regions through dissemination meetings and dissemination of achieved results through implementation of the project.
- By implementing this project, strengthened & developed partnership in between region and learn how to work and adapt technology in a different socio-cultural setting.
- The expected and unexpected results and lessons learned will be recorded and disseminated through dissemination meeting, media and distribution of hard copy of final report with results and lessons learned to the partners and relevant stakeholders in the Mekong Region.

# Partners of the Project

## Nordic Partners:

- **University of Boras, Sweden**
- **Boras City, Sweden**

## Mekong Region Partners:

- **VUDAA, Lao PDR**
- **DONRE, Ho Chi Minh City**
- **DoE, Phnom Penh Municipality**
- **Detudom Municipality, Ubon Ratchathani Province, Thailand**

# Partners Major Responsibilities (cont'd)

## **Phnom Penh Municipality, Cambodia:**

- Nominate Mayor/senior officials to attend study visit in Boars City, Sweden
- Nominate staff to attend one month technical training at the University of Boras, Sweden
- Support in conducting feasibility study in dumpsite managed by Phnom Penh Municipality.
- Nominate staff to attend regional training and arrange local training.
- Implement biogas plant installation demonstration project in an urban poor community in Phnom Penh Municipality and supply of biogas to poor families for cooking. Submit progress and completion report to AIT, Thailand.
- Prepare project progress report and final report and send to AIT
- Submit progress and final financial report to AIT with necessary receipts as per financial guidelines.
- Organize launching and dissemination meeting and distribute dissemination materials/report with results and lessons learned.

# Partners Major Responsibilities (cont'd)

## VUDAA, Lao PDR:

- Nominate Mayor/senior officials to attend study visit in Boars City, Sweden
- Nominate staff to attend one month technical training at the University of Boras, Sweden S
- Support in conducting feasibility study in dumpsite managed by VIUDAA.
- Nominate staff to attend regional training and arrange local training.
- Implement biogas plant installation demonstration project in an urban poor community in Vientiane Capital and supply of biogas to poor families for cooking.
- Prepare project progress report and final report and send to AIT
- Submit progress and final financial report to AIT with necessary receipts as per financial guidelines. Organize launching and dissemination meeting and distribute dissemination materials/report with results and lessons learned.

## Partners Major Responsibilities (cont'd)

### **Boras City, Sweden and University of Boras:**

- Arrange and conduct one month technical training at the University of Boras for Technical staff of 4 city offices from 4 countries of Mekong region
- organize training courses
- Arrange study visit of Mayor and senior city officials to Boras city in collaboration with University of Boras.
- Prepare project progress report and final report and send to AIT
- Submit progress and final financial report to AIT with necessary receipts as per financial guidelines.

# Partners Major Responsibilities (cont'd)

## Detudom Municipality, Thailand:

- Nominate Mayor/senior officials to attend study visit in Boars City, Sweden
- Nominate staff to attend one month technical training at the University of Boras, Sweden
- Nominate staff to attend regional training.
- Organize dissemination meeting and distribute dissemination materials report with results and lessons learned.
- Prepare project progress report and final report and send to AIT
- Submit progress and final financial report to AIT with necessary receipts as per financial guidelines.

## Partners Major Responsibilities (cont'd)

### Ho Chi Minh City, Vietnam:

- Nominate Mayor/senior officials to attend study visit in Boars City, Sweden
- Nominate staff to attend one month technical training at the University of Boras, Sweden
- Nominate staff to attend regional training
- \* organize dissemination meeting and distribute dissemination materials report with results and lessons learned.
- \* Prepare project progress report and final report and send to AIT
- \* Submit progress and final financial report to AIT with necessary receipts as per financial guidelines.

# Study Visit to Boras City, Sweden



**Study Visit Participant in a meeting with Mayor of Boras City  
in Boras City Hall**



# Study Visit to Borås City, Sweden



**Bus and waste collection vehicles plying in Borås uses biogas generated from waste and it is written on the bus and truck in Swedish language ("Vi kör på biogas")**

# Study Visit to Boras City, Sweden



Participants in a community in Boras City, Sweden to observe the waste management services provided by city to the community-Waste bin provided by city office in community (left), participants observing waste bin (right)

# Study Visit to Boras City, Sweden



Community members drop waste at community level recycle centre (left) and toxic and hazardous waste storage site (right) in Boras City, Sweden



# Study Visit to Borås City, Sweden



1. Waste Vending in ICA Maxi Shopping Mall in Borås City, Sweden to buy recyclable and pay money machine and machine count the price and pay money automatically (left).
2. A citizen bring recyclable bottles and plastic to drop in the machine and collect money (right)

# Study Visit to Borås City, Sweden



**Waste Collection Vehicles dropping waste at the sorting station in Sobacken (left) and study tour participants observing the waste is carrying by the conveyer belt to separate in Sobacken (right)**



# Study Visit to Boras City, Sweden



**Sorted biodegradable waste in Sobacken (left) and devices where biodegradable waste pressed to extract liquid from the solid part and liquid send to a container through pipes (right)**

# Study Visit to Boras, Sweden



**Storage of extracted liquid from the biodegradable in Sobacken (left)  
and biogas generation chamber in Sobacken (right)**

# Study Visit to Boras City, Sweden



Combustible wastes are carried by automatic machine to drop in a designated place to carry by the conveyer belt in Incineration Site in Boras City (left) and designated area to drop the waste by the automated machine (right)



# Technical Training in the University of Borås, Sweden



# Technical Training in the University of Borås







# Technical Training in the University of Borås



# Technical Training in the University of Borås





# Launching meeting in Lao PDR



# MONITORING AND EVALUATION

Project Coordination Unit will do regular Monitoring and evaluation:

- i) Through review progress report submitted by the partners
- ii) PD will visit project sites and have meeting with partner organizations to monitor the project progress
- iii) Regular monitoring by e-mail and telephone

Conduct Mid-term Monitoring and Evaluation

# Challenges and Strategy to overcome the challenges

- Flooding and Inundation of AIT under 2 to 3 m water
- Thai Government Declaration and Apprehension of Flooding in Bangkok City Centre
- Suspended Travels to have meeting with partners in Oct and Nov'11 due to flooding
- Staff hiring delayed due to flooding and AIT Inundation. Steps were taken, soon the staff will join.
- Delayed Inception meeting and plan to organise after Study Tour and Technical Training, thus local participants can actively involved and promote it whatever they have seen and learnt from the study visit and technical training. Study Tour and Technical Training participants will act as spoke person of the waste refinery and zero waste concept.
- Last moment decline of attendance to study tour by 2 partner institutions. Project Coordination unit negotiating with University of Boras and Boras City regarding organizing study visit for 2 cities during technical training in between Jan-Feb'11.



# Way Forward

- Successful Completion of project through overcoming challenges
- Explore fund to conduct feasibility study and implement demonstration project
- Explore fund to extend the project activities in more cities of Mekong region for their capacity development and also conduct feasibility study and implement demonstration project (school children can be involved)
- Support countries of Mekong region to draft climate friendly, zero waste and zero dumpsite concept related energy policy and waste management policy; as well as support its implementation and monitor implementation. Policy Advocacy campaign engaging different stakeholders and
- Dissemination events essentials for wide spreading the results and

# Strategy of Ultimate Achievement

- **Arrangement of Fund to construct Waste to Energy infrastructure: 3 ways can be done:**

- a) 100% Grant to construct infrastructure and support in construction through transfer of technology and transfer technical know-how.
- b) Soft Loan to cities to construct waste refinery infrastructure and support in construction through transfer of technology and transfer technical know-how.
- c) Find Company to fund to construct and manage infrastructure and collect management fees to recover the investment

# Looking forward

- Climate sensitive energy and waste management policy in place in countries in Mekong region by 2020
- Countries in Mekong Region adopted zero waste and zero landfill concept by 2021-2025
- No more landfill site in the Mekong region countries by 2030
- Waste refinery practiced in all countries in the Mekong region
- Continuous support needed to make sure the zero waste concept introduction and its implementation by providing infrastructural support.

# Countries Expectation

- Continuous support until achieving goal instead of piece meal and un-interrupted support or support like fire fighting is not worth.
- Support in continuous monitoring and evaluation in adopting and implementation of policies and infrastructure development and kept in operation
- Continuous Technical and technological support until achieve the target goal.

# By 2030

- Zero waste and zero waste in place in the Mekong Region
- Countries in Mekong Region take leading role to disseminate and implement zero waste and zero land fill concept in other Asian countries ?
- Climate friendly energy and waste management policy in place in all countries in the Mekong region, and take leading role in its implementation in other Asian countries?

# Lessons for City Managers/city citizens

- **Consider Waste as Resource-** Mind set towards waste needs to change
- **Teach the School Children** about *separation of waste at source, 3Rs, waste to energy and zero waste, zero landfill and reduce greenhouse gas emission*
- **Showcase the results** through demonstration instead of saying in words to make city citizens believe, convince and understand, as people don't like to accept without seeing in their eyes or prove
- **Start with a pilot project in a small scale project in different communities** instead of start with large scale project and move forward with lessons learned to install large project manage centrally.

# THANK YOU

Project Blog URL :

<http://eep3r091.wordpress.com> ■