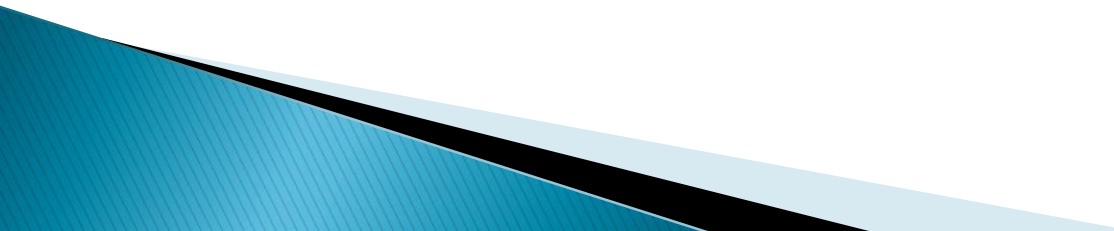


Integrated Approaches to Urban Sanitation Improvement in Pacific Countries: Examples of CDM project


Mahfuz Ahmed

Pacific Department
Asian Development Bank

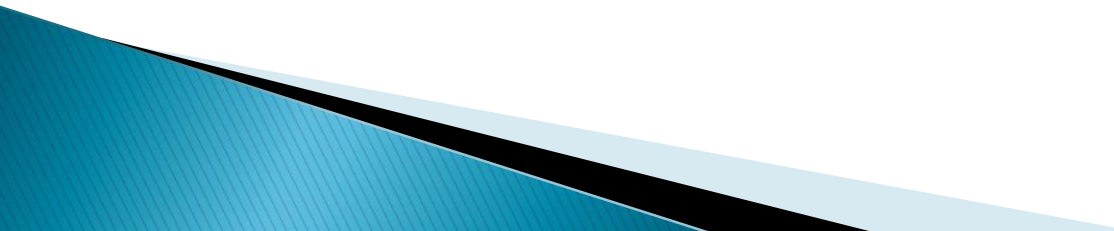
Outline of Presentation

- ▶ **Urban Sanitation Issues in the Pacific Island Countires**
 - ▶ **Potential for Waste to Energy & CDM Projects**
 - ▶ **Vanuatu Case Study: Port Vila Urban Development Project**
 - ▶ **Fiji Case Study: Kinoya Sewerage Treatment Plant GHG Reduction Project**
- 

Urban Sanitation Issues in Pacific

- ▶ **Sewage is the most significant source of marine pollution in the Pacific region**
 - ▶ **Overflowing latrines, water seal toilets, septic systems, sewage treatment plants (if any) as well as the complete lack of sanitation facilities in some places**
 - ▶ **In many PIC's human waste is normally collected in septic tanks at household level and transported to a dump site**
 - ▶ **Improper sanitation is resulting in algae blooms and eutrophication in lagoons, dying reefs, contaminated drinking water wells and outbreaks of gastro-intestinal disease and cholera**
- 

Potential for Waste to Energy & CDM Projects under Urban Sanitation

- **GHG emissions in the waste sector result from methane (CH_4)**
 - **Methane is produced when organic waste decomposes under anaerobic conditions**
 - ▶ **Methane is 21 times more harmful than CO_2 (Global Warming Potential)**
 - ▶ **Methane can be captured and utilised for electricity and thermal energy needs**
 - ▶ **Methane Capture & Utilisation projects can also benefit from carbon revenues under CDM**
- 

Vanuatu Case Study


Port Vila Urban Development Project



Aerial View of Central Port Vila

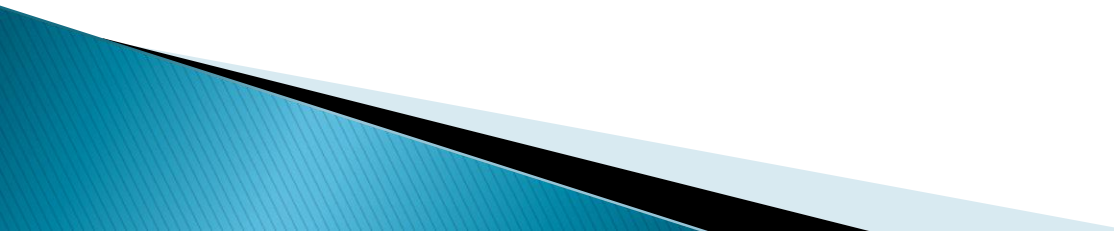


Vanuatu - Background

- ▶ **Increasing urban and peri-urban population**
 - Port Vila with 44,000 residents
 - Greater Port Vila with 59,000 residents and may reach 109,000 by 2025
 - Growing number of tourists with about 3,000 to 4,000 tourists at a given time
 - ▶ **Improved telecommunications and water supply**
 - ▶ **Inadequate and poor conditions of sanitation facilities and hygiene services, roads and drainage**
- 

Issues and Concerns

Existing Sanitation Practices

- ▶ Liquid waste disposed of using septic tanks or simple soak-away pits
 - ▶ Solid waste transported to and discharged in sanitary landfill
 - ▶ Untreated sludge disposed of in open pits near major waterways
 - ▶ Collected sludge transported and discharged into a pit within the sanitary landfill
- 

Existing Public Toilet Facilities



Toilet and urinal at municipal sports stadium



Hand basin at bathroom

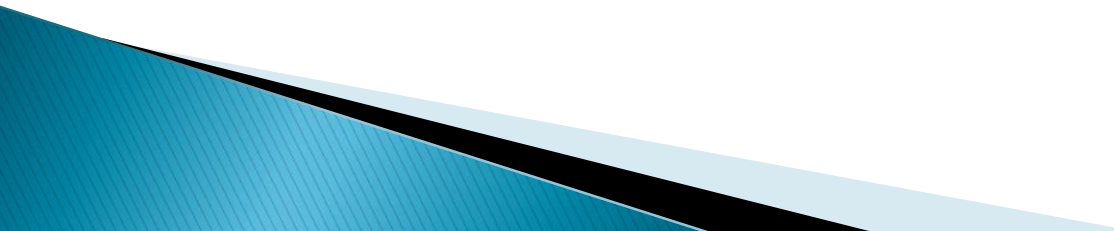


Public community toilets and showers



Toilet and shower at public market


Issues and Concerns (continued)

- ▶ **Environmentally unsatisfactory system for removal and disposal of human waste**
 - Disposed untreated sludge exposes the urban population to waterborne diseases
 - ▶ **Communities within the urban and peri-urban areas, and major public areas of central business district lack safe and hygienic sanitation facilities**
- 

Issues and Concerns (continued)

- ▶ **Contamination of groundwater by seepage from septic tanks and soakaways**
 - Pollution of inshore waters surrounding Port Vila
 - Euthrophication of lagoons
- ▶ **Adverse environmental impacts from poorly designed and managed landfill**
 - Wind-blown litter, attraction of vermin, and generation of liquid leachate
 - Methane and CO₂ create odor problems, kill surface vegetation, and contribute to global warming.

Integrated Approach to Waste Disposal and Treatment

- ▶ **Better management of privately operated sludge collection and disposal system**
 - ▶ **Design and construction of a sludge treatment plant (STP) and disposal facility**
 - ▶ **A new site for sludge disposal and treatment (will also be the site for a full-scale sewage treatment plant in the future)**
 - ▶ **Capture and utilisation of methane from Anaerobic Digestion of Sludge as a Clean Development Mechanism (CDM) project as an integral part of STP**
- 

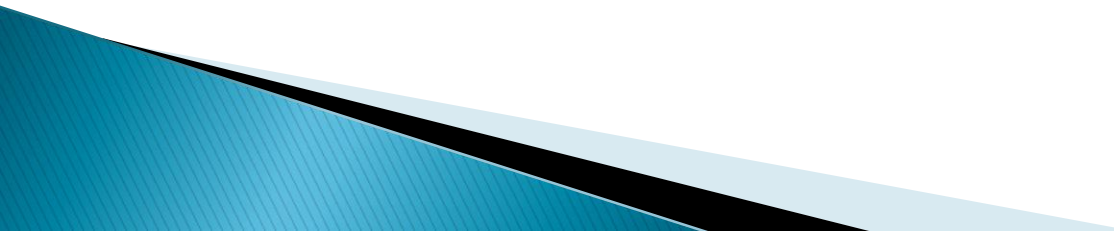
Integrated Approach to Waste Disposal and Treatment (continued)

► Biogas development

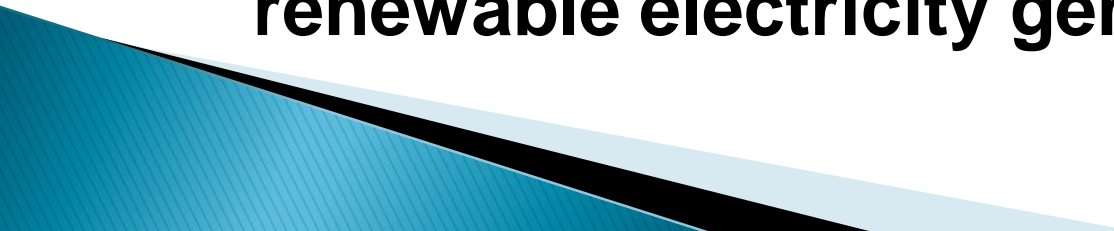
- Sludge anaerobic digestion
- Anaerobic sludge treatment

Year	Estimated Biogas Generated (m ³ /year)	Potential Electricity Generated (Kwh/year)
2015	110,667	221,333
2020	144,260	288,519
2025	158,745	317,490
Ave	138,000	275,781

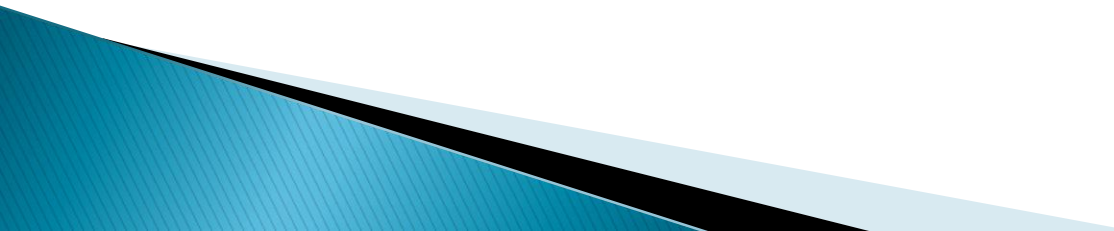
CDM Assessment

- **Biogas Capture & Utilisation from Anaerobic digestion of Sewerage Sludge**
 - **It is estimated that the project will reduce on an average 4200 tonnes of CO₂e per year.**
 - **Total carbon-derived revenue at about \$30,000–\$40,000/year for 10 years (considering a carbon price of \$9/ton of CO₂)**
 - **Additionality Demonstrated through - ‘First of its Kind’ in the host country; barrier analysis and/or investment analysis as appropriate;**
- 

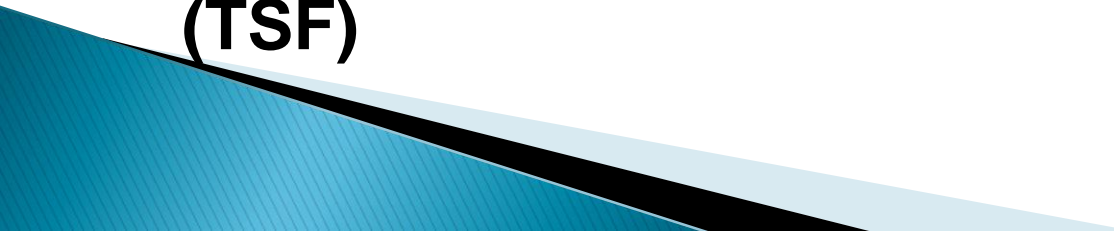
CDM Assessment (2)

- **The project can also take advantage of Simplified procedures for demonstrating additionality for Micro-scale project activities**
 - **Identified CDM Methodologies: AMS II.AO: Methane recovery through controlled anaerobic digestion and/or AMS III.H: Methane recovery in wastewater system**
 - **In combination with AMS I.F: Renewable electricity generation for captive use and mini-grid and/or AMS I.D: Grid connected renewable electricity generation**
- 

CDM Project Merits

- **First of its Kind Project in Vanuatu**
 - **Positive impacts on local environment & hygiene**
 - **In line with the Sustainable Development goals of Vanuatu**
 - **Additional revenue through carbon credits**
 - **Role model for CDM project developers in the host country and in the Pacific region**
- 

CDM Project: Assistance from Carbon Market Program

- **Potential upfront cofinancing from the Future Carbon Fund for up to 50% of credits generated until 2020**
 - **ADB (Credit Marketing Facility) can assist in selling the additional credits on a pay-on-delivery basis to enhance the financial viability of the project.**
 - **Development of CDM documentation with grant assistance from the Technical Support Facility (TSF)**
- 

Fiji Case Study

Kinoya Sewerage Treatment Plant - GHG Emission
Reduction Project

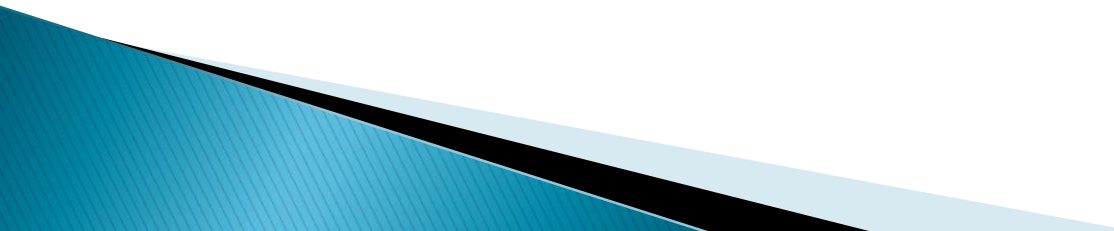


Fiji Case Study - Kinoya Sewerage Treatment plant GHG Emission Reduction Project

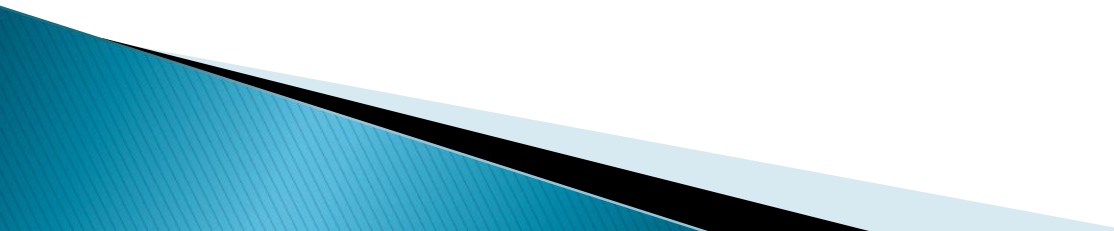


- **Main objective: Capture & Utilisation of Methane from Anaerobic Digestion of Sludge**

Project Details

- **Developed by Water Supply & Sewerage Department (WSD)/Water Authority of Fiji**
 - **located at Kinoya, Suva city, Viti Levu Island, Republic of Fiji Islands**
 - **Current Scenario – Venting of Methane from Anaerobic Digester**
 - **CDM Project Intervention – Capture & Flaring of Methane**
- 

CDM Details

- **CDM sectoral scope: Waste handling and disposal**
 - **Scale of project: Small Scale**
 - **Source of emission reductions: Methane recovery and flaring from anaerobic digestion of wastewater sludge**
 - **Baseline scenario: venting the methane in wastewater & sludge into atmosphere.**
 - **Approved baseline methodology: Type III.H - Methane recovery in waste water treatment (III.H./Version 16)**
 - **Estimated annual emission reductions: 22,469 tCO₂e**
- 

CDM Project Status

- **Project developed with support from Technical Support Facility, Carbon Market Programme, ADB**
 - **Certified Emission Reduction Purchase Agreement (CERPA) has been signed with Asia - Pacific Carbon Fund**
 - **Project is registered with UNFCCC as of 3rd May 2011**
 - **The envisaged operational date for the project is during November/December 2011**
- 

Conclusions

- **Significant opportunities exists for developing Small-Scale CDM projects under Urban Sanitation sector in Pacific Island nations**
- **Potential Projects Include:**
 - **Methane recovery and utilization from landfills & wastewater treatment – anaerobic decomposition - Electricity & Thermal Energy**
 - **Methane avoidance – aerobic treatment – Composting/aeration of landfills – Soil Fertilizer**
- **High Potential for Replication within the Host Countries as well as across the Pacific**
- **Urban Sanitation projects under CDM can lead to environmental protection, healthier community and income generation**

Thank you.

For more details:
akmahmed@adb.org