



Manual for Quantitative Evaluation of the Co-Benefits Approach to Climate Change



UNFCCC AWG Side Event in Barcelona, Spain

- Quantitative Assessment of Co-benefits: Addressing Mitigation Actions and Local Benefits -

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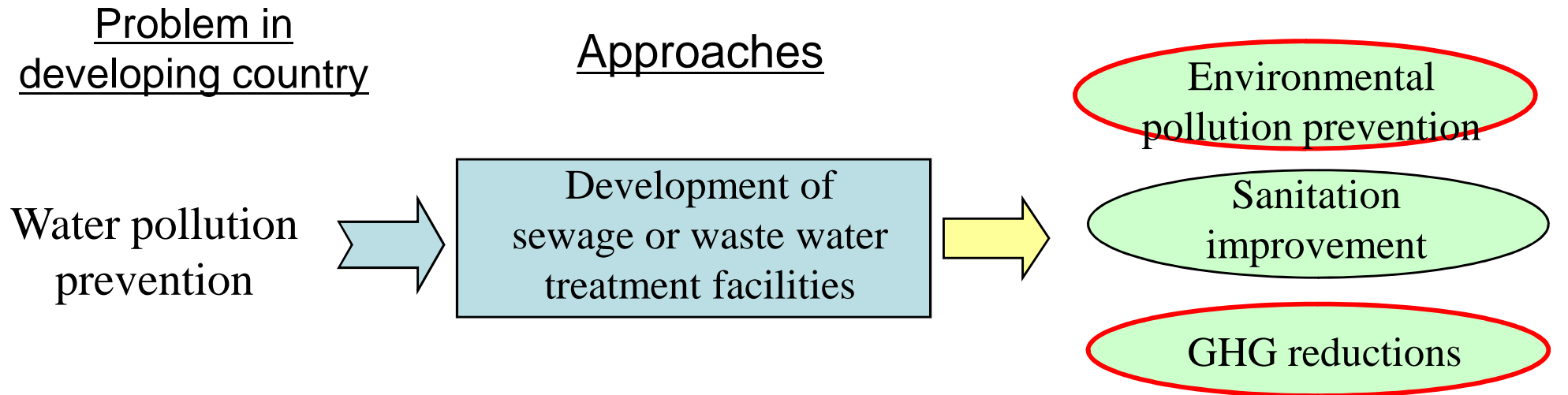
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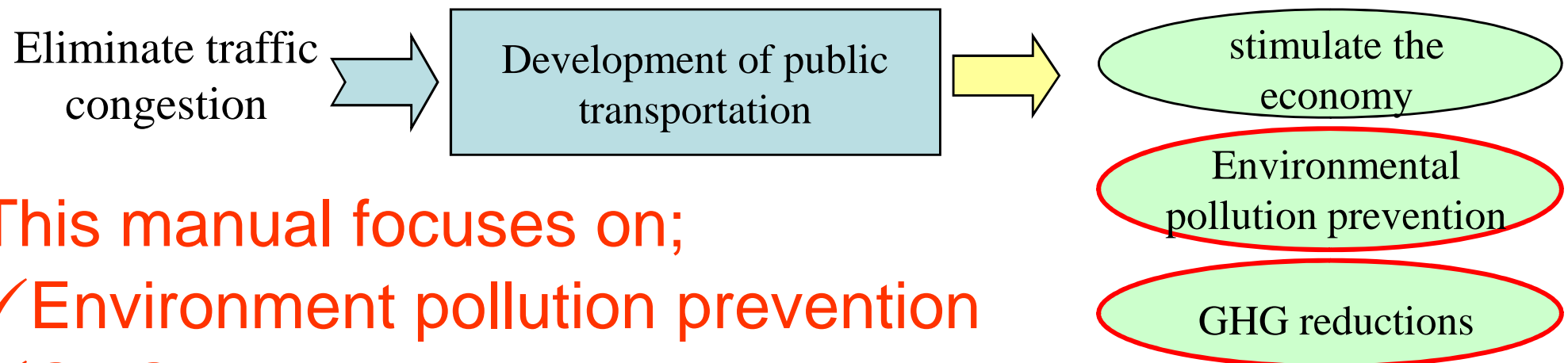
Outline of this presentation

- What is “Co-Benefits” in this Manual?
- Objectives of the manual
- Evaluation Indicators
- Evaluation Methodologies
- Case study
- Conclusion

What is “Co-Benefit” in this Manual?



Approach has a lot of benefits!



This manual focuses on;

- ✓ Environment pollution prevention
- ✓ GHG reductions

Focused Categories

This manual focuses on the three issues below,

- Water Quality Improvement
- Air Quality Improvement
- Waste Management

The reason;

- ✓ Important problem in developing countries
- ✓ Quantitative evaluation is relatively easy

Objectives of the manual

The Manual...

- ✓ Provides quantified and simple methods to evaluate Co-benefits, including environmental pollution improvement and GHG mitigation measures
- ✓ Promotes public/private entities to implement positive and effective Co-benefits CDM projects

Manual for Quantitative Evaluation of the
Co-Benefits Approach to Climate Change Projects

Version 1.0

June 2009

Ministry of the Environment, Japan

What is used as Evaluation Indicator?

✓ Indicator should

- ◆ Represent the problem in the object field
- ◆ Be Easy to measure/verify
- ◆ Be able to be measured by an existing established method



Laboratory of local survey company



Waste transport vehicle in Indonesia

Evaluation Indicators

Category	Environment Improvement	GHG reduction
Water Quality Improvement	COD Odor	CH ₄ CO ₂
Air Quality Improvement	SO _x NO _x Dust	CO ₂
Waste Management	Coverage ratio of Collection Area Collection ratio of waste Recycle ratio Amount of waste COD Odor	CH ₄ CO ₂

What is the problem to evaluate quantitatively?

- ✓ *It is difficult to obtain data continuously*

Example; Waste water from a slaughter house

- ✓ Waste water including blood and fat etc.
- ✓ Only sedimentation tank (it is not working)
- ✓ No water quality analysis data



Waste water from slaughter house in Indonesia

Need to develop methods to apply to the situations

Evaluation Methodologies

Level	Description of Evaluation Methodology	Explanation
Tier 1	<u>No calculation</u> Based on evaluation criteria corresponding to the actual details of the activity	When it is difficult to obtain the data for the quantitative evaluation. This approach is the easiest to implement.
Tier 2	<u>Using a predetermined equation</u> and the available measurement data.	Use actual measurement data. Where no measurement data is available, default values are used.
Tier 3	Using measurement data for activities and parameters, and <u>using specific equations</u> .	Use actual measurement data and specific equations.

Evaluation Criteria for Tier 1

Evaluation criteria	Applicability condition	Emission reduction	Grade (Certainty of reduction)
<p><u>Certain</u> Reduction in water pollutant discharge and suppression of odors is certain</p>	<ul style="list-style-type: none"> • Absolute certainty that direct processes to reduce water pollutant discharges and suppress odors can be introduced. • After implementation, monitoring of operational conditions can be conducted to confirm proper operation. 	Large	5
		Small	4
<p><u>High probability</u> High probability of water pollutant discharge reduction and odor suppression</p>	<ul style="list-style-type: none"> • Equipment will be installed that will contribute to water pollutant discharge reduction and odor suppression. • After implementation, monitoring of operational conditions can be conducted, to confirm proper operation. • It is possible to monitor the status of initiatives relating to regulations of emissions and confirm whether or not they are being implemented. 	Large	3
		Small	2
<p><u>Likely to</u> Water pollutant discharge reduction and odor suppression are likely, but qualitative (not quantitative).</p>	<ul style="list-style-type: none"> • Implementation of initiatives to raise awareness relating to impacts on surrounding environment of water pollutants and odors, and related countermeasures. • It is possible to implement follow-up studies on these initiatives, and confirm positive results. 	-	1

Category: Water quality improvement

Case Study of evaluation by Tier1 : Water Quality Improvement

Baseline: No waste water treatment facilities

Project: Install the Anaerobic treatment facilities

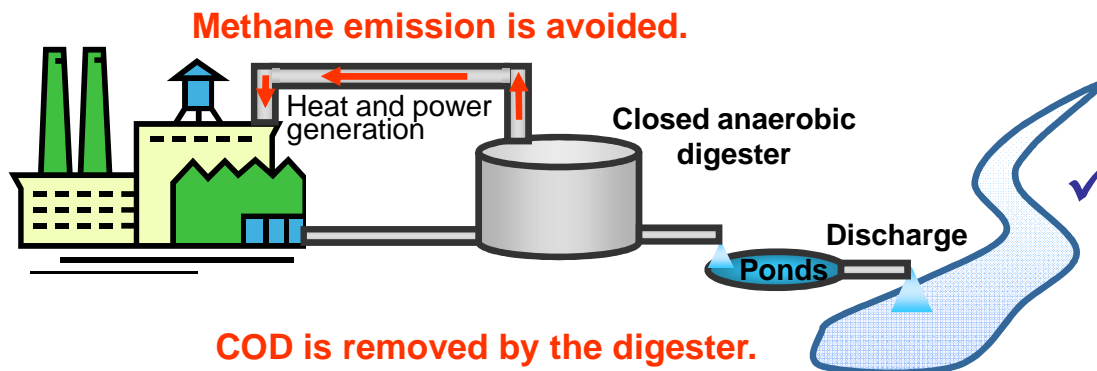
- ✓ The project has a possibility of reducing water pollutants
- ✓ Monitoring of the operating condition of the facility is implemented
 - the applicability condition applies to evaluation criteria, 'high probability'
- ✓ Estimated amount of emission reduction will be large
- Therefore, the co-benefit of this project is evaluated " 3 " basis on "Evaluation Criteria "

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Case Study of evaluation by Tier2 : Water Quality Improvement

- Installation of anaerobic wastewater treatment equipment at a palm oil mill (CDM-ref.1783)
 - ✓ 80 tons of fresh fruit bunches (FFB) ,generates 288,000 m³ annually of highly organic wastewater containing palm oil residue.
 - ✓ COD concentration in wastewater: 0.0500 (t-COD/m³)
- Type of wastewater treatment



- ✓ Baseline: Open lagoon (depth 2 m or greater)

✓ Project : Anaerobic wastewater treatment equipment

Case Study of evaluation by Tier2 : Water Quality Improvement

$$BE_{COD,y} = COD_{const,treatment} * (1 - R_{COD,BL}) * Q_{BL,y}$$

- The COD removal rate (baseline scenario) : 10%
- The COD level in the baseline scenario is calculated as follows:

$$BE_{COD,y} = 0.05 * (1 - 0.1) * 288,000 = 12,960(t - COD)$$

- Assuming COD removal rate (project scenario) : 95%
- The COD level under the project scenario is calculated as follows:

$$PE_{COD,y} = 0.05 * (1 - 0.95) * 288,000 = 720(t - COD)$$

- The COD discharge reduction is $12,960 - 720 = 12,240$ (t-COD).
- ✓ The GHG emission reduction can be calculated using approved CDM methodology.

Evaluation Criteria for Tier 1

Evaluation criteria	Applicability condition	Emission reduction	Grade (Certainty of reduction)
<p><u>Certain</u> Reduction in problems relating to waste management (including offensive odors) is certain</p>	<ul style="list-style-type: none"> • Absolute certainty that direct processes to reduce the amount of waste and negative impacts on the surrounding environment can be introduced. • After implementation, monitoring of operational conditions can be conducted, to confirm proper operation. 	Large	5
<p><u>High probability</u> High probability of reduction in problems relating to waste management (including offensive odors)</p>	<ul style="list-style-type: none"> • Equipment will be installed that will contribute to waste reduction and a reduction of negative impacts on the surrounding environment • After implementation, monitoring of operational conditions can be conducted, to confirm proper operation. • For efforts to reduce waste (e.g., 3Rs), it is possible to monitor the state of efforts and confirm that they are being implemented 	Large	3
<p><u>Likely to</u> Reduction in problems relating to waste management (including offensive odors) are likely, but can only be evaluated qualitatively (not quantitatively)</p>	<ul style="list-style-type: none"> • Implementation of initiatives to raise awareness relating to impacts on surrounding environment of illegal dumping and waste abandonment as well as offensive odors, and related countermeasures • It is possible to implement follow-up studies on these initiatives, and confirm positive results. 	-	1

Category: Waste management

Case Study of evaluation by Tier1 : Waste management

Baseline: No composting facilities

Project: Install composting facilities

- ✓ The equipment will be installed that will contribute to waste reduction
- ✓ Monitoring of operating conditions can be conducted
 - the applicability condition applies to evaluation criteria, 'High probability'
- ✓ Estimated amount of waste reduction will be large (depend on the amount of waste)
 - Therefore, the co-benefit of this project is evaluated " 3 " basis on "Evaluation Criteria "

Case Study of evaluation by Tier2: Waste management

■ Installation of composting facilities

- ✓ The project will reduce the amount of waste which are dumped in landfill site

$$D_{\text{volume}} = D_{\text{volume,BL}} - D_{\text{volume,PJ}}$$

- ✓ The project also will reduce the COD concentrations in leachate

$$R_{\text{COD}} = \text{BL}_{\text{COD}} - \text{PJ}_{\text{COD}}$$

- The GHG emission reduction can be calculated using approved CDM methodology.

Evaluation Methodologies

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Evaluation Sheet (Draft)

- ✓ Input the results of evaluation into the Evaluation sheet
- ✓ Use it for assessment of the project, pre-assessment of the counter measure

Specific Area of Co-Benefit	Evaluation Indicator	Selected Evaluation Indicator	Selected Evaluation Methodology			Evaluation Result
			Tier 1	Tier 2	Tier 3	
Water pollution prevention	COD					
	Odors					
	Nitrogen					
	Phosphorus					

Conclusion; Next Targets

■ *Improvement of the Manual*

- ✓ Examine the other candidate of indicators
- ✓ Include the other candidate of evaluation categories
- ✓ Develop the method to convert the effect to monetary value

■ *Apply the Manual to the Model projects by MOEJ*

- ✓ Apply the manual to the model projects by MOEJ
- ✓ Feedback the result from model projects to the Manual



Thank you for your attention

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