

## Japan-China Cooperation on Total Emission Control in China

---

Tetsuo Kuyama

Researcher, Beijing Office

Institute for Global Environment Strategies (IGES)

# Today's Presentation

---

## Introduction of Japan-China cooperation on model projects of decentralized domestic wastewater treatment in rural China

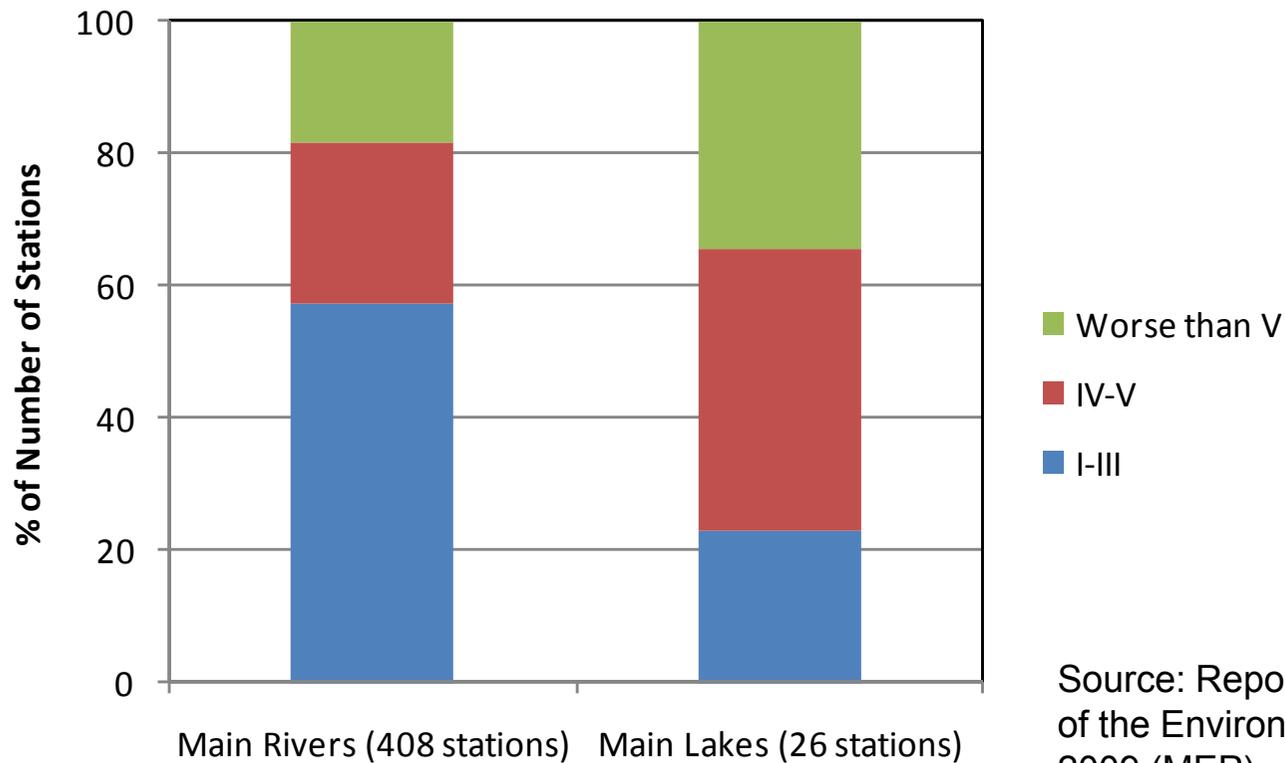
- **Background and objective**
- **Outline**
- **Progress and Current Output**
- **Lessons learned from the project**
- **Others**

## Background and Objective

- **This project (Japan-China cooperation regarding model projects of decentralized domestic wastewater treatment in rural China) was implemented since FY 2008 based on the agreement between Ministry of Environmental Protection of the People's Republic of China and Ministry of the Environment of Japan**
- **The objective of this project is to identify policy issues and formulate recommendations for the Chinese Government regarding the development of domestic wastewater treatment systems in rural areas through demonstration study**



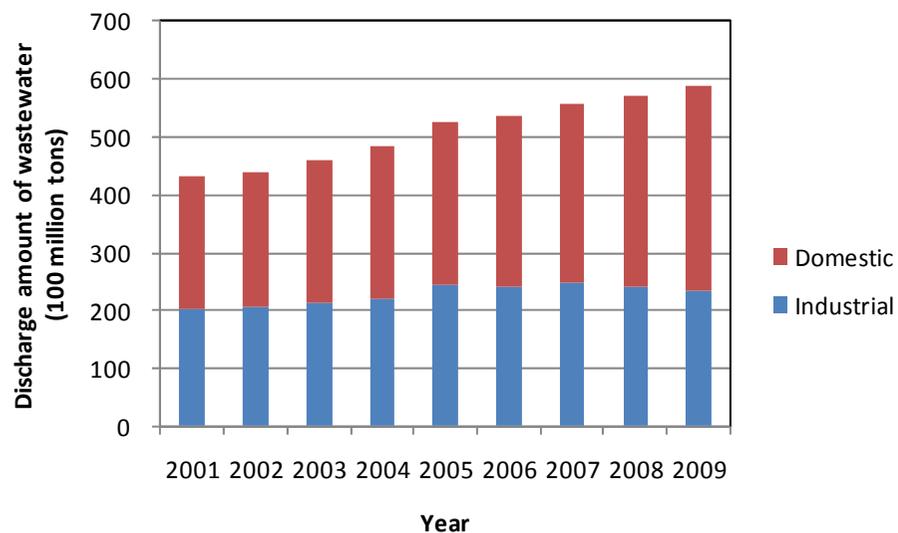
# Water Quality of Main Rivers and Lakes in China



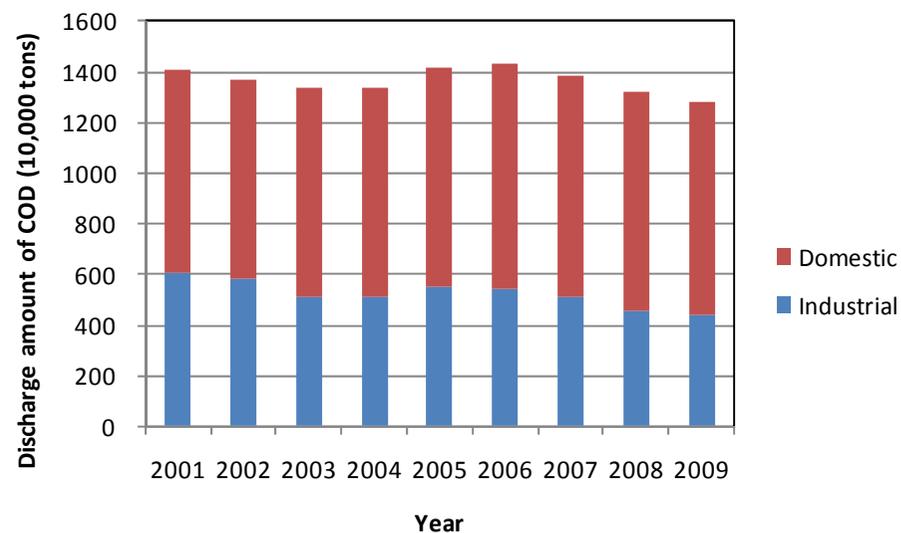
Source: Report On the State of the Environment In China 2009 (MEP)

## Situation of Surface Water Quality (2009)

# Wastewater Discharge and COD Load in China



Wastewater Discharge



CDO Discharge

## Historical Change of Discharge Amount of Wastewater and COD in China

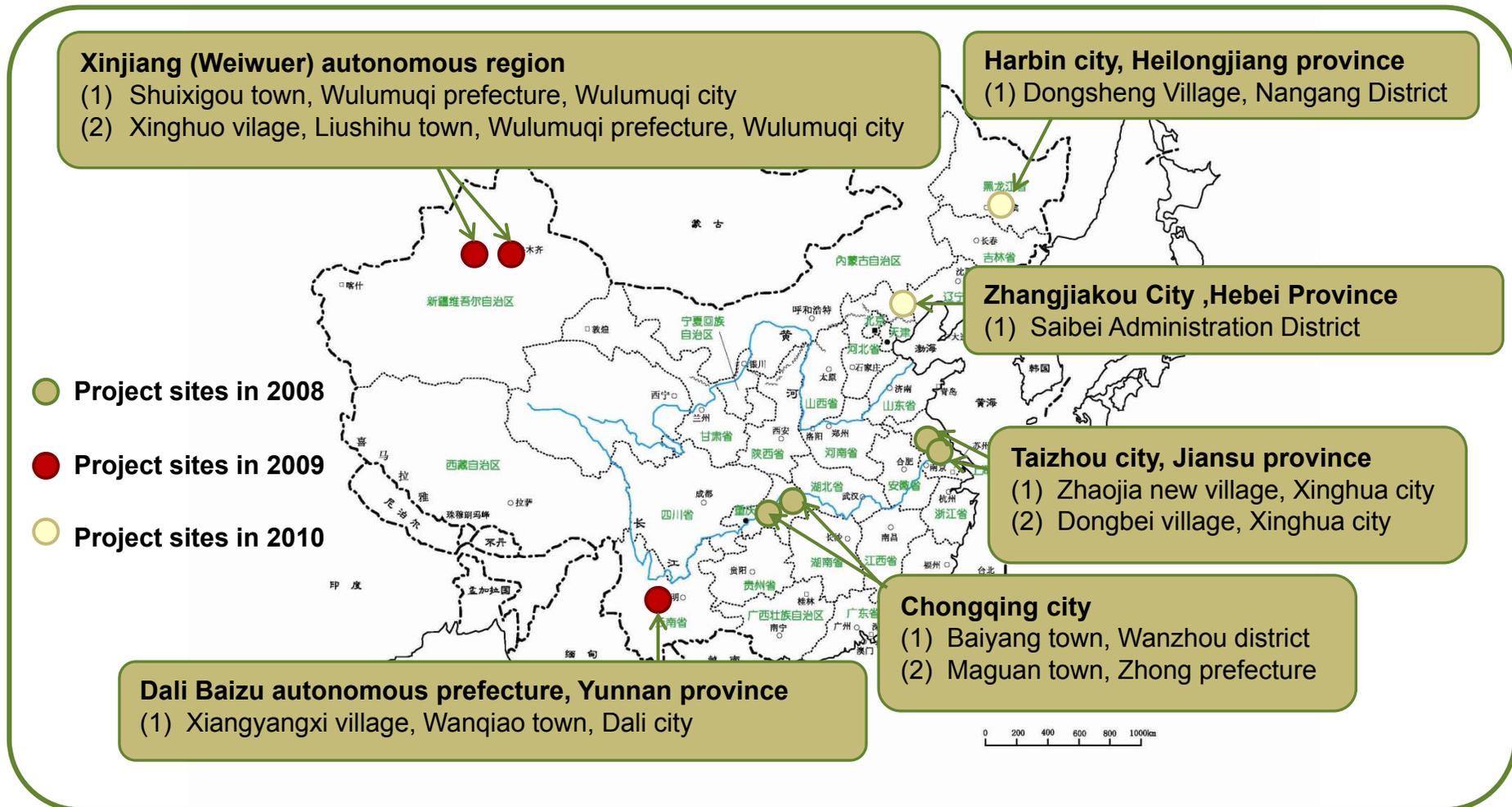
Source: Report On the State of the Environment In China (MEP)

## **Necessity of Domestic Wastewater Treatment in Rural Areas of China**

---

- ✓ **Volume of domestic wastewater exceeded industrial wastewater in 1999**
- ✓ **Urban sewage treatment rate :  
52.0 %(2005)→ 76.9%(2010)**
- ✓ **Villages with domestic wastewater treatment system:  
4% (2007)**
- ✓ **Larger population in rural areas than urban areas**
- ✓ **Increase of wastewater discharge from rural areas is expected along with the improvement of living standards**

# Map of Study Area of Model Projects



## Outline of Model Projects

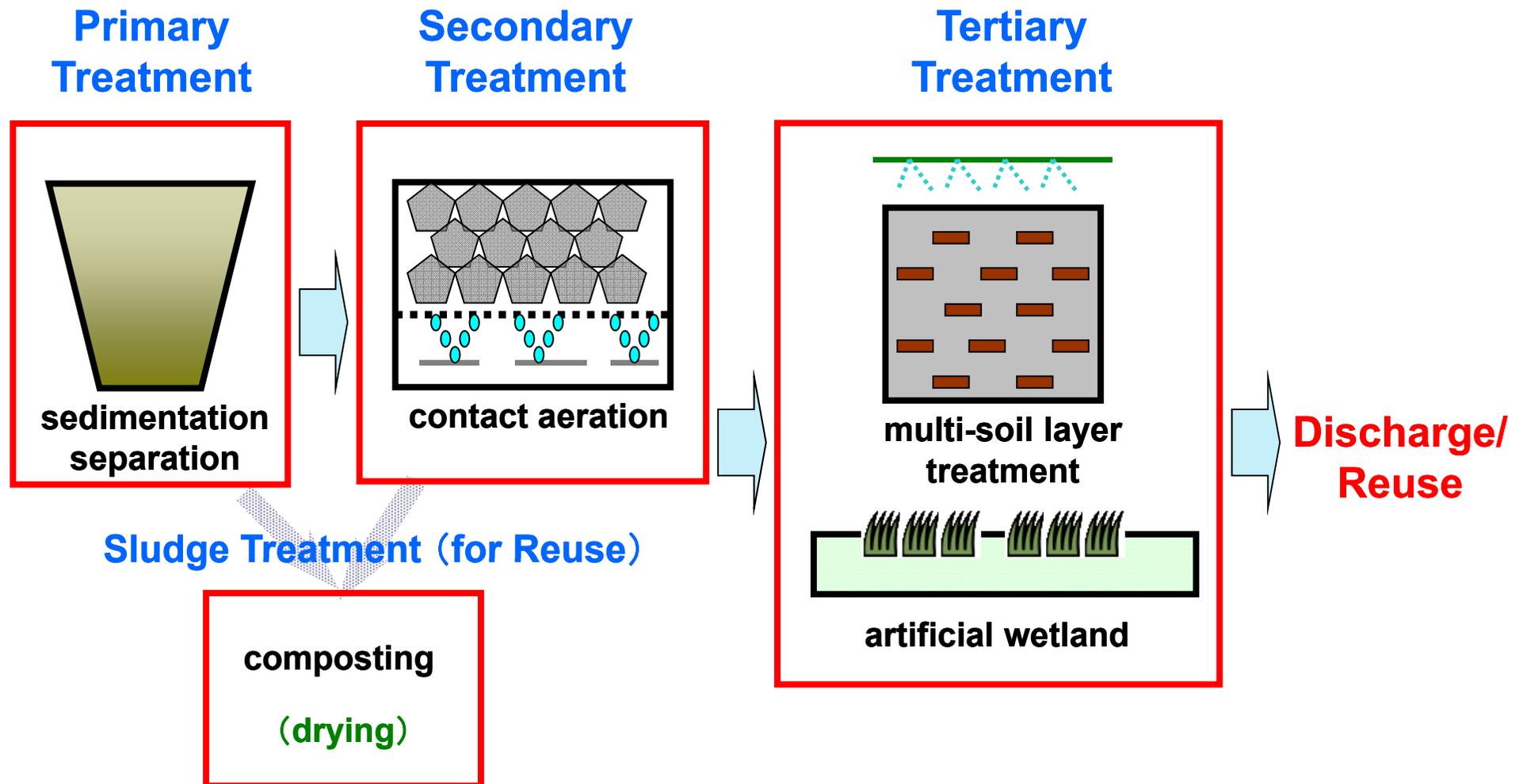
No	Project Sites	Population	Influent	Capacity (m3/day)	Treatment Method
1	Maguan town (Chongqing city)	6,000	Night soil, Gray water	500	Active sludge + Artificial Wetland
2	Baiyang town(Chongqing city)	6,000	Night soil, Gray water	600	Contact Aeration+ Artificial Wetland
3	Zhaojia new village (Jiangsu province)	750	Night soil, Gray water	150	Contact Aeration
4	Dongbei village (Jiangsu province )	200	Night soil, Gray water	40	Contact Aeration
5	Shuixigou town (Xinjiang autonomous region)	4,200	Night soil, Gray water, Rain water	300	Contact Aeration
6	Xinghuo village (Xinjiang autonomous region)	1,600	Night soil, Gray water, Rain water	40(80)	Contact Aeration
7	Xiangyuanxi village (Yunnan province)	2,600	Night soil, Gray water	200	Contact Aeration+ Multi-soil layer
8	Dongsheng Village (Heilongjiang province)	3,200	Night soil, Gray water	250	Contact Aeration
9	Saibei Administration District (Hebei Province)	9,000	Night soil, Gray water	600	Contact Aeration

## Consideration Points for Project Implementation

---

- ✓ **Simple treatment process and technology for easy management**
- ✓ **Adaptation of treatment process and technology to socio-ecological and natural conditions**
- ✓ **Waste sludge treatment for reuse as compost**
- ✓ **Use of artificial wetland or soil treatment for low cost treatment**
- ✓ **On-site construction by using materials and labor available at site**

# Concept of Applied Treatment Process



# Use of Artificial Wetland Treatment



**Artificial wetland in  
Maguan town**



**multi-soil layer treatment  
in Xiangyuanxi village**

# On-site Construction



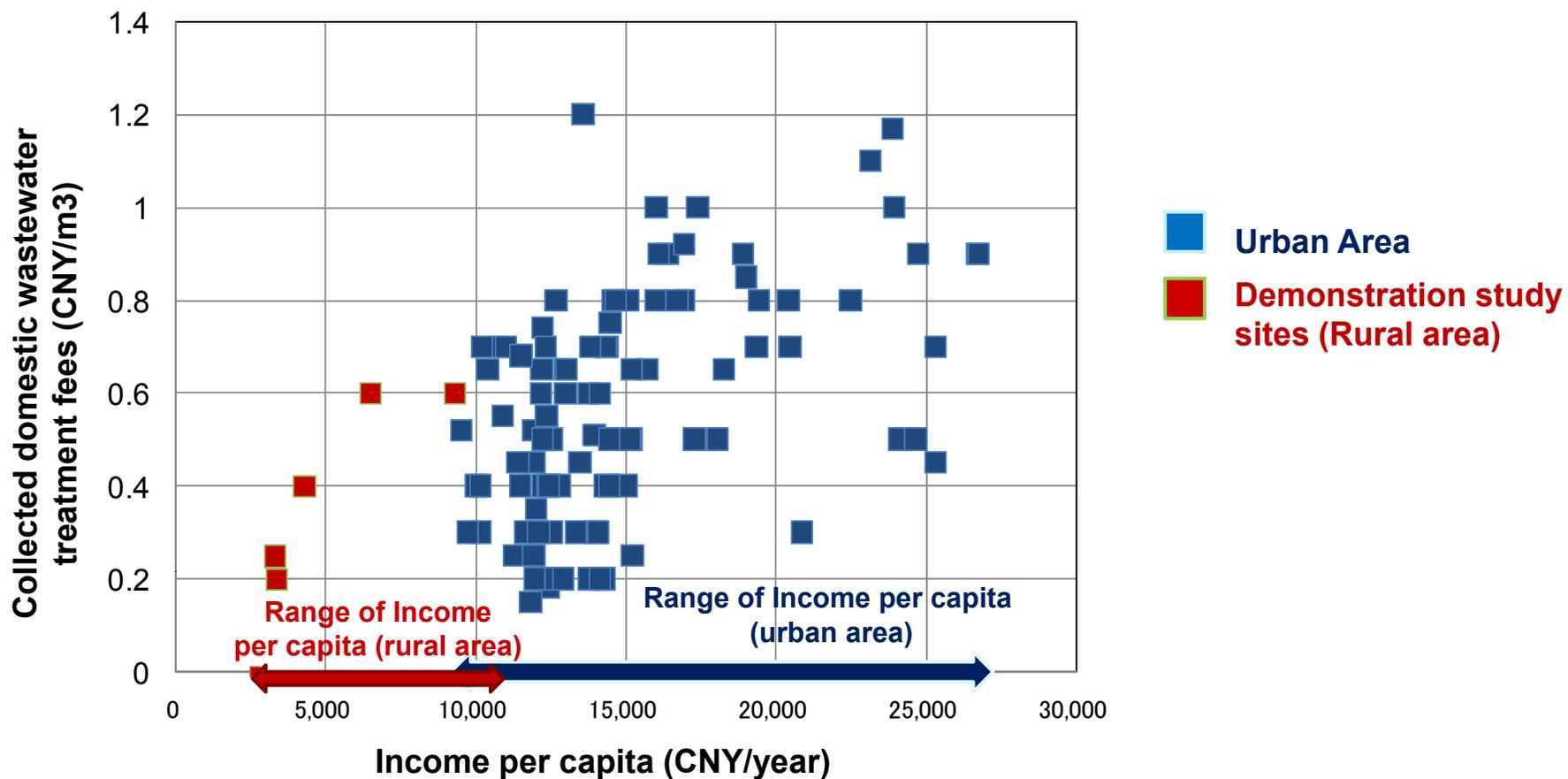
**Construction phase of Baiyang town**

# On-site Construction



**Construction  
phase of  
Zhaojia new  
village**

# Affordable Operational Cost Range in Rural Area of China



## Progress of Model Projects

---

### Completed (Plan, Construction, 1-year operation, Evaluation)

- Maguan town (Chongqing city)
- Baiyang town (Chongqing city)
- Zhaojia new village (Jiangsu province)
- Dongbei village (Jiangsu province )

### On-going

- Shuixigou town (Xinjiang autonomous region)
- Xinghuo village (Xinjiang autonomous region )
- Xiangyuanxi village (Yunnan province)
- Dongsheng Village (Heilongjiang province)
- Saibei Administration District (Hebei Province)

# Constructed Facility (Maguan town)



**Constructed Facility**



**Aeration tank**



**Effluent Water**



**Facility for Sludge drying**



**Artificial Wetland**

# Constructed Facility (Baiyang town)



**Constructed Facility**



**Aeration  
Tank**



**Artificial  
Wetland**



**Effluent  
Water**

# Constructed Facility (Zhaojia new village )



**Constructed Facility**



**Effluent Water**



**Influent Water**

# Constructed Facility (Dongbei village)



**Constructed Facility**



**Effluent Water**

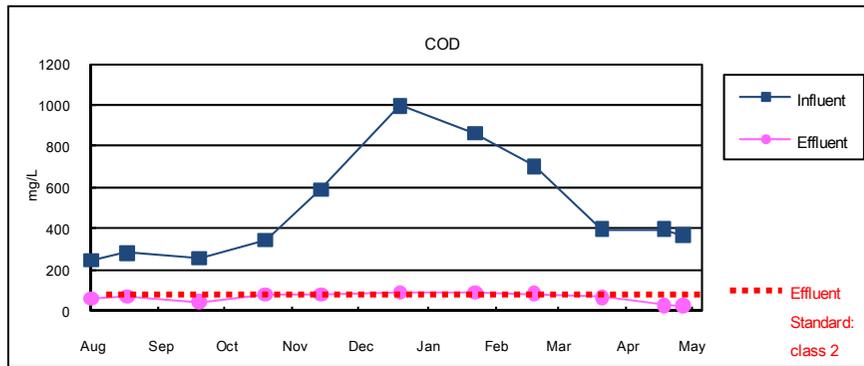
**Influent Water**

# Indicators for Model Project Evaluation

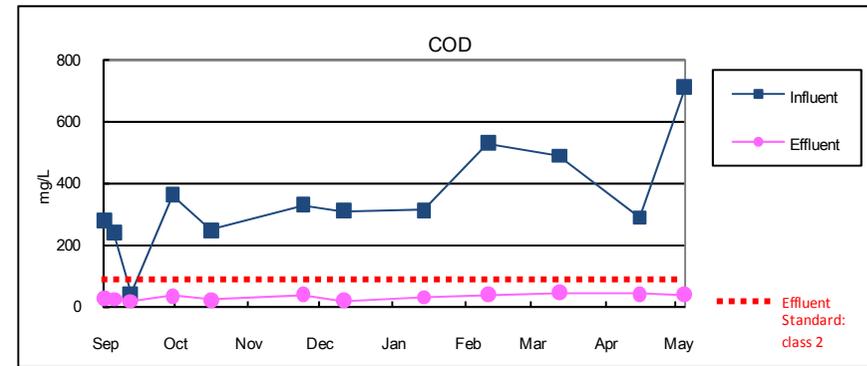
---

- ✓ **Effluent Water Quality**
- ✓ **Initial Cost (for Construction)**
- ✓ **Operational Cost**

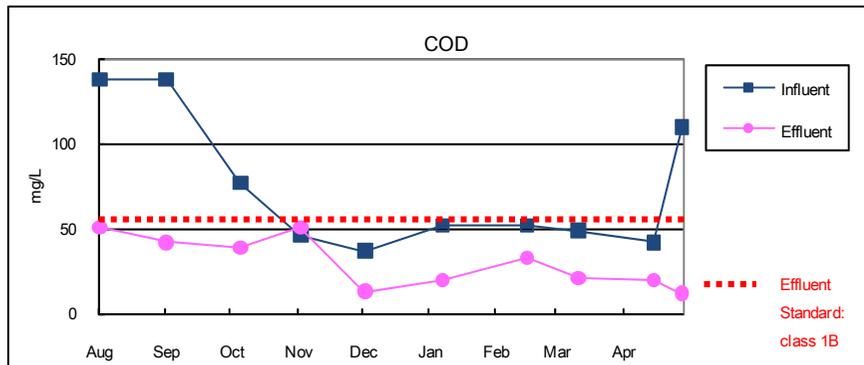
# COD Level of Effluent Water



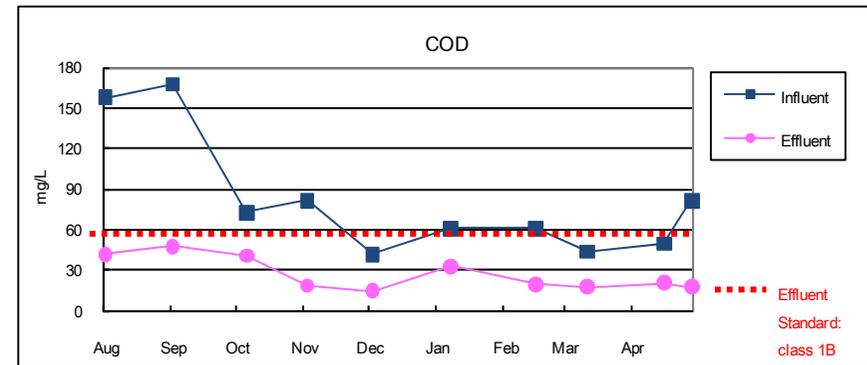
**Maguan town (Chongqing city)**



**Baiyang town (Chongqing city)**

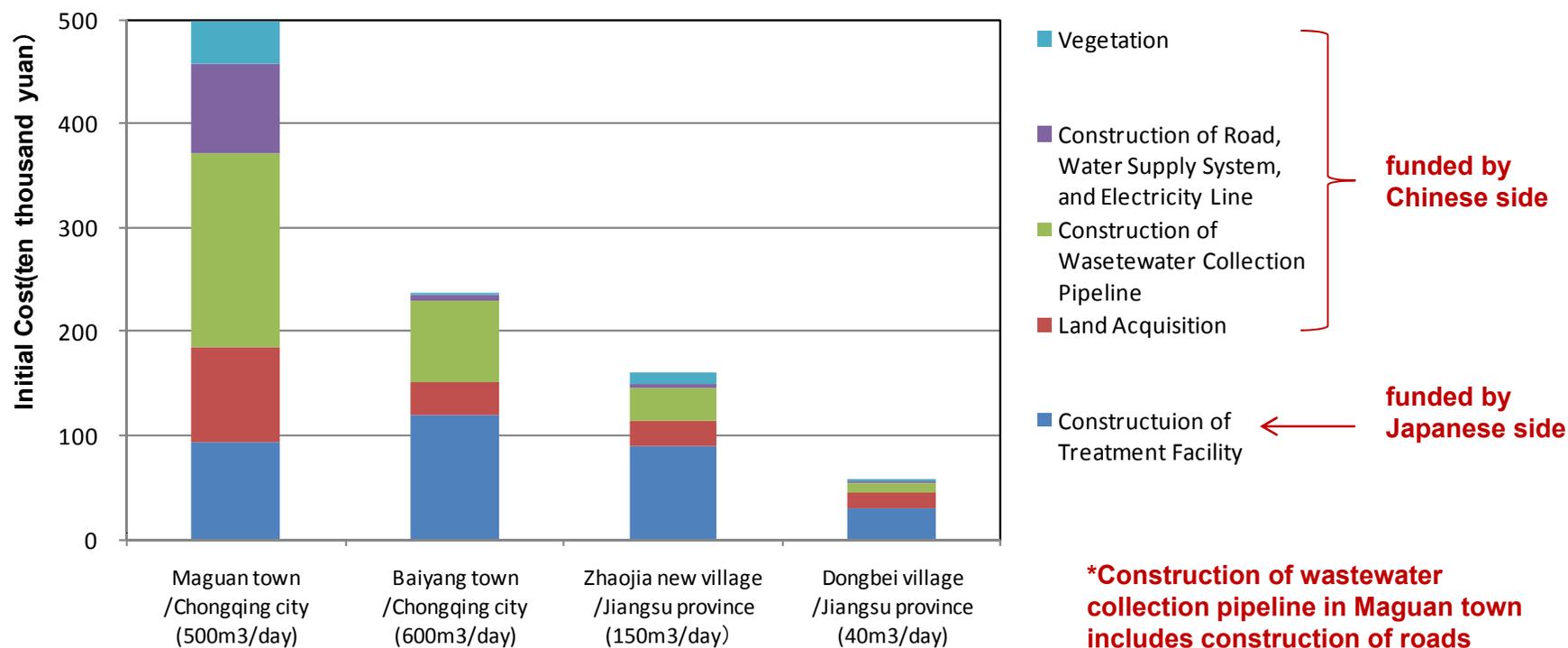


**Zhaojia new village (Jiangsu province)**

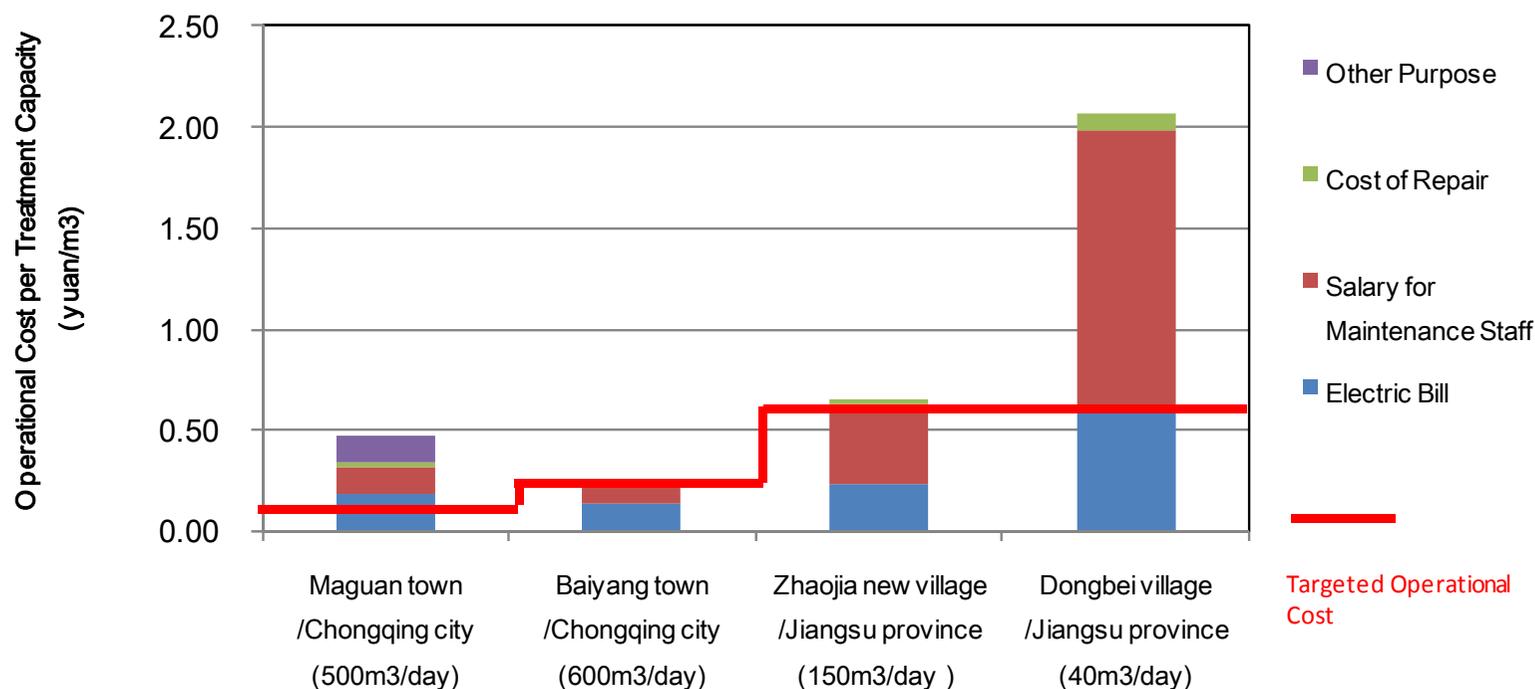


**Dongbei village (Jiangsu province)**

# Initial Cost



# Operational Cost

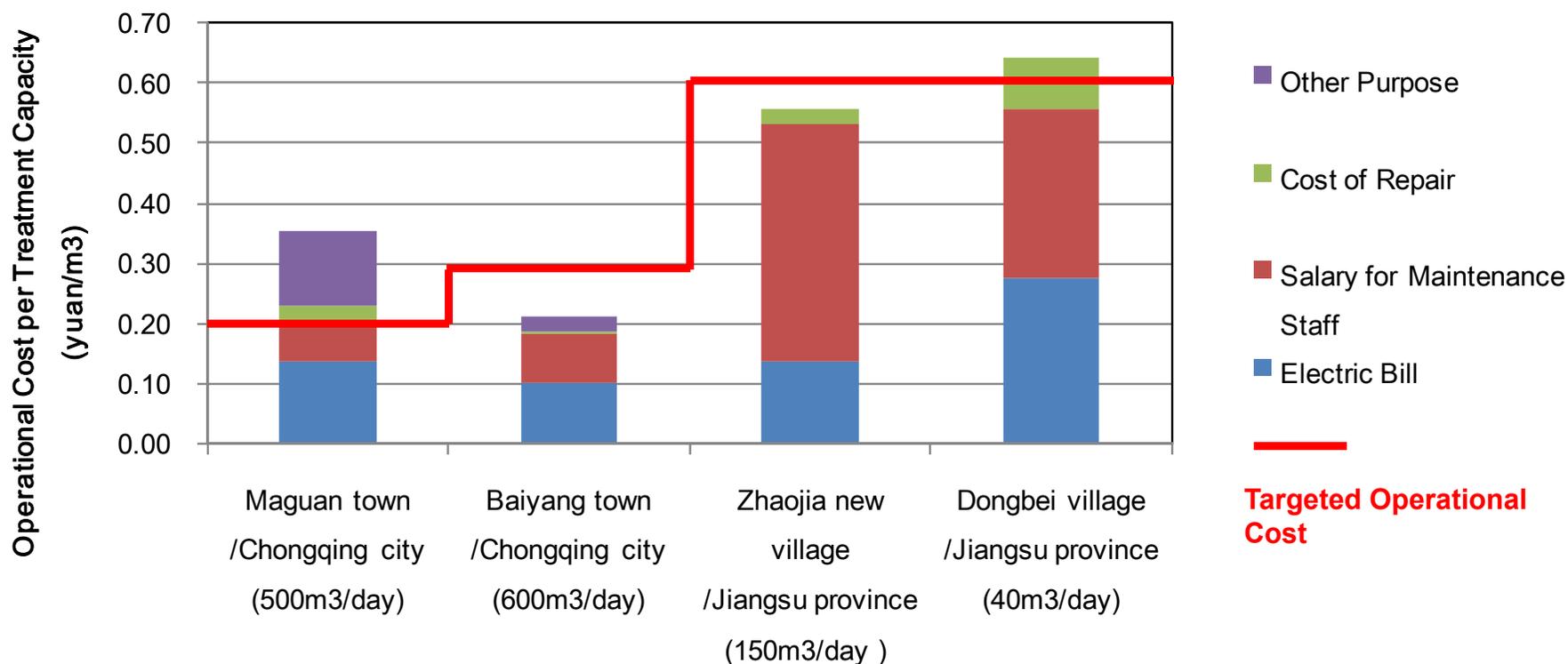


**Review of electricity billing system (from industrial to agricultural purpose) and operational system is needed in order to lower operational costs**

## Scenario for Lowering Operational Cost

Place	Electricity Billing System	Operational System
Maguan town /Chongqing city	(Current) Electricity for industrial purpose → (Future) Electricity for agricultural purpose	(Current) Maintained by 2 staff per facility →(Future) Maintained by 1 staff per facility
Baiyang town /Chongqing city		-
Zhaojia new village /Jiangsu province		-
Dongbei village /Jiangsu province		(Current) Maintained by 1 staff per facility →(Future) More than five facilities to be maintained by 1 staff

# Adjusted Operational Cost



# Cost for Repair and Other Purposes

---

## Cost of Repair

1. Maintenance and Repair of Equipments
2. Oil Exchange of Equipments
3. Repair and Exchange of Damaged Pump

## Cost for Other Purposes

1. Cleaning and Delivery of Sludge
2. Maintenance of Artificial Wetland

## Lessons Learned from the Project

---

- **Applied technology can contribute to total emission control in China**
- **Contact aeration method is feasible for small scale domestic wastewater treatment facilities in rural China**
- **Construction of pipelines for wastewater collection costs more than the actual treatment facility**
- **Electricity billing system and operational system should be reviewed in order to lower operational cost**
- **Costs for maintenance and repair of equipments, management of waste sludge, and maintenance of artificial wetland are needed in addition to costs for manpower and electricity**
- **Waste sludge requires treatment costs if it is not re-used**

## Project aimed to Support Implementation the Total Pollutant Load Control System (TPLCS) to East Asian Country by MOE Japan

Serious water pollution problems in East Asia



To improve the water quality

Introduce and Implement the TPLC system

2009~2010 Japan-China collaborative research on the TPLC ( N, P )



Development of the Manual for Implementing the TPLCS



Promoting the application to East Asian country

# Manual for Implementing the TPLCS

## 1. Importance of the TPLCS

- What is the TPLCS ?
- Importance of implementation of the TPLCS, etc.

## 2. Execution procedure of the TPLCS

- Outline of the TPCLS, Individual operation, etc.

## 3. How to operate TPLCS more efficiently

- Coordination among interested parties
- How to facilitate pollutant reduction and compliance

To get the Manual and more information,

■ Download <http://www.env.go.jp/en/water/> (after June)

■ EMECS9 Baltimore, USA August 28<sup>th</sup>~31<sup>th</sup>

# Introduction of New Project on Total Emission Control

## 中华人民共和国环境保护部和日本国环境省 关于合作实施小城镇氨氮总量减排 示范项目的备忘录

中华人民共和国环境保护部与日本国环境省(以下简称“双方”)为落实中日两国政府于2007年4月签署的《中华人民共和国政府和日本国政府关于进一步加强环境保护合作的联合声明》以及于2007年12月发表的《中华人民共和国政府和日本国政府关于推动环境能源领域合作的联合公报》,在2008年5月6日双方签署的《关于合作实施小城镇分散型污水处理示范项目的备忘录》和依据该备忘录实施的双方合作成果的基础上,为中国“国民经济和社会发展第十二个五年规划”期间进一步开展水污染物总量减排提供积极支持,双方就合作实施小城镇氨氮等总量减排示范项目及相关事项达成一致如下:

### 一、项目目标

加强双方在氨氮等水污染物总量减排领域的政策与技术交流,通过示范项目的实施,减少示范地区的水污染物排放量,改善水环境质量。

### 二、项目内容

#### (一) 示范项目地点的选择

双方通过现场调研,选择三个具有代表性的示范地点,实施小城镇氨氮等总量减排示范项目。示范地点的选择应在双方协商的基础上,由中国环境保护部确定。

#### (二) 示范项目的实施方案

##### (1) 污水处理设施建设

根据示范地点的实际情况,以氨氮等水污染物总量减排为目的,建设具有一定技术水平和规模的污水处理示范设施。

##### (2) 开展氨氮等水污染物减排管理研究

主要的研究内容包括示范项目的监测评价和效果分析,氨氮等水污染物总量减排技术与指南等。

##### (3) 召开研讨会

双方择机在中国联合召开“中日污染物总量控制相关政策与技术交流研讨会(暂定名)”。

### 三、项目的实施安排

本合作示范项目自2011年开始实施,暂定为期3年。

### 四、项目的实施

双方共同协调和组织项目的实施,并对知识产权的保护给予留意,在各自权限以及预算的范围内提供人员、技术及资金支持。

### 五、其他事项由双方通过协商做出安排。

本备忘录于2011年4月28日在韩国釜山签署,一式两份,用中文和日文写成。

中华人民共和国环境保护部

日本国环境省




## Launch Agreement between Ministers of both countries regarding New Project on Total Emission Control

---

**Thank you**