



DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

DONRE

SMALL WASTEWATER TREATMENT STATION

FOR

APARTMENT BUILDINGS & HOSPITALS

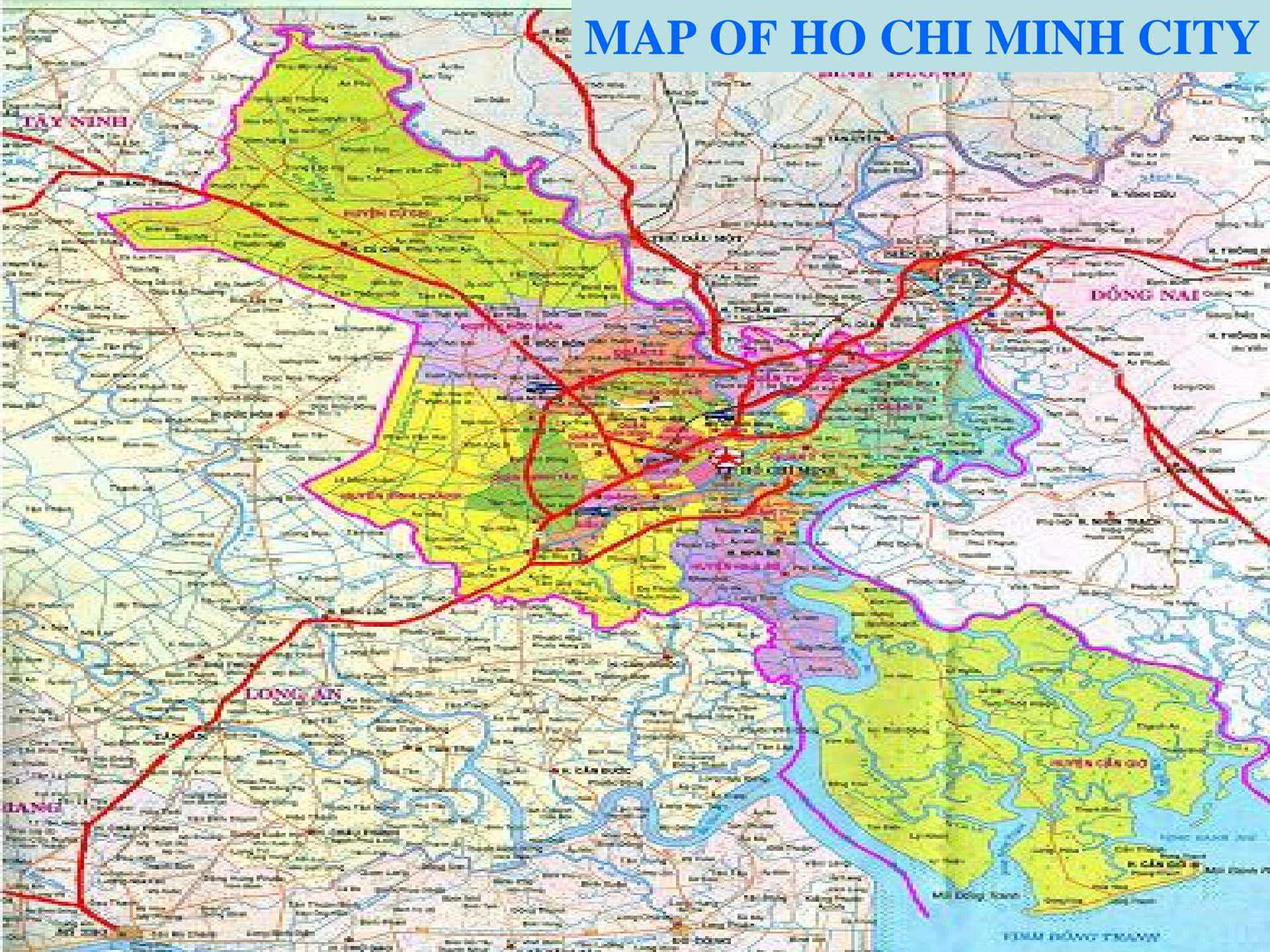
EXPERT GROUP MEETING

FUKUOKA, JAPAN

30 NOV. – 2 SEPT., 2011



MAP OF HO CHI MINH CITY





HOCHIMINH CITY - *Overview*

- **Geographical location:** is a special metropolitan, a mega-center of economy, culture, education, technology, holds an important political spot in the country; an international exchange hub; a multi-sector technological and service center in the region and in South East Asia.
- **Administrative organization:** 24 districts and 322 wards
- **Natural/Urban Area:** 2,095.73/140 km² (center area)
- **Population:** over 9 million (2011), in which 7,165,398 are registered (residents) and nearly 2,000,000 are transient.
- **Residential area:** 1,833,800 residences (houses, villas, apartment buildings – 400,000)



HOCHIMINH CITY - *Overview*

- **Health care:**

- + **Hospital: 185 (private (small) hospital - 19).**
- + **District health care centers: 400**
- + **Private Clinic: 12.000**

- **Commercial centers:**

- + **Commercial center: 31**
- + **Supper market: 97**
- + **Traditional market: 200**



HOCHIMINH CITY - *Overview*

- **Industry:**

- + **Industrial zone: 11 industrial zones, 03 import-export industrial zones và 01 hi-tech park.**
- + **Industrial clusters: 30**
- + **Industrial facilities:**
 - **2,000-2,200 large plants (with a capital investment of over 10bill VND and average no. of workers over 300/yr);**
 - **9,000-10,000 small & medium production facilities;**



SEWERAGE SYSTEM

- **Type of sewerage system: combined system (domestic wastewater, industrial wastewater and storm water) and half separated system (new system);**
- **Drainage basin: 9;**
- **Future wastewater treatment plant (master plan): 7 (200,000 – 500,000 m³/d)**
- **Present wastewater treatment plant: 2**
 - + **Binh Hung Hoa: 30,000 m³/d (biological pond system), ODA project (Denmark)**
 - + **Binh Hung: 141,000 m³/d (aerobic activated sludge process), ODA project (Japan)**



SEWERAGE SYSTEM

PROBLEMS

- Dilute wastewater (BOD < 200 mg/L, COD < 300 mg/L);
- Sludge treatment and reuse;
- Energy consumption;
- Air pollution (offensive smell) from sludge treatment building;



SMALL WASTEWATER TREATMENT FOR APARTMENT BUILDINGS & HOSPITAL

- According to Vietnamese Environmental Law & Regulations (2005) all apartment buildings and hospital should have wastewater treatment plants;
- Applied treatment technology: aerobic activated sludge processes (normal) or biological hybrid processes (seldom)
- **Problems:**
 - + **Limit of land for wastewater treatment station;**
 - + **Sludge treatment;**
 - + **Operators**



QUESTIONS & DISCUSSIONS

- 1. SMALL SCALE WASTEWATER TREATMENT STATION? WHAT IS THE BEST MODEL?**
- 2. SLUDGE TREATMENT AND REUSE? WHICH IS APPROPRIATE TECHNOLOGY?**



THANK YOU