Wastewater Production, Treatment, and Use in Indonesia

Fifth Regional Workshop

Safe Use of Wastewater in Agriculture

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Wastewater Production and Treatment

Wastewater category in Indonesia

- Domestic wastewater, Industrial wastewater, and Liquid health care waste
- Volume of domestic wastewater increased by 5 million m3/year, which contains 50% of pollutants
- For the construction of wastewater, the proportion of households served by local processing system and a centralized system of communal scale in 2006 in national reach 69.3 percent (81.8 percent in urban areas and 60 percent in rural areas).

Wastewater production risk level

- Domestic wastewater (organic compounds and pathogen)
- Industrial wastewater from industrial (heavy metals and hazardous)
- Liquid health care waste from health care facility (heavy metals and pathogen)

Treatment models (on site and centralized)

- Domestic wastewater : septic tank, plant remediation
- Industrial wastewater : wastewater treatment plant, bioremediation. fermentation
- Liquid health care waste : wastewater treatment plant

Wastewater Use and/or Disposal

- The use of wastewater for agriculture is still new in Indonesia.
- Management of wastewater is mainly for the purpose of environment and health protection.

Wastewater Category	Use	Disposal
Domestic wastewater	Black water → power and energy source (methane) and fertilizer	Grey water → drainage or sewerage to water bodies (river, lake, etc)
Industrial wastewater		After treatment → sewerage to water bodies
Liquid health care waste	After treatment → Vehicle wash, fish ponds, plant watering	After treatment → sewerage to water bodies

Regulations and Implementation of Guidelines|1

Regulations	Notes
Government's Act No.32/2009 on Protection and Environmental Management	**This act deals with environmental management in general, which include management of wastewater impact to the environment.**
Government's Act No.7/2004 on Water Resources	**On section 21 subsection (2) that protection and preservation of water resources handled by setting sanitation infrastructure.**
Government's Act No. 36/2009 on Health	**Regulate that Ministry of Health are responsible in securing the liquid waste in attempting environmental health.**
Government's Act No.44/2009 on Hospital	**Regulate that Hospitals to develop and maintain waste treatment plant in case to securing solid and liquid waste.**

Regulations and Implementation of Guidelines|2

Regulations	Notes
Government Regulation No.20/1990 on management of water pollution	**This regulation mainly focused on how to manage water pollution, its use and disposal, and role of government institutions either at district, province or central levels.**
Government Regulation No.18/1999 on Hazardous waste management	**Regulate all activities which produce hazardous waste forbidden to disposal direct to environment without treatment.**
Government Regulation No.82/2001 on management of water quality and water pollution	**This regulation very concern on how to maintain and improve water quality as well as to protect water resources from contamination and pollution.**
Government Regulation No.16/2005 on Drinking Water System Development	**Protecting the raw water, potency of solid and liquid waste to pollute the raw water.**
Government Regulation No.20/1990 on management of water pollution	**This regulation mainly focused on how to manage water pollution, its use and disposal, and role of government institutions either at district, province or central levels.**

Regulations and Implementation of Guidelines|3

Regulations	Notes
Ministry of Health Regulation No.1204/2004 on Environmental Health Requirements of Hospital	**Regulate to supporting of policy on wastewater treatment in hospitals, or collaborated with legalized private sectors.**
Medium Term Development Plan (RPJMN) 2010-2014	**Provides a set of rules at the central and / or local to support provision of drinking water, wastewater and solid waste, through additions, revisions, or deregulation legislation**
Ministry of Health Regulation No.1204/2004 on Environmental Health Requirements of Hospital	**Regulate to supporting of policy on wastewater treatment in hospitals, or collaborated with legalized private sectors.**

Challenges|1

Government's Act No.32/2004 regulates the responsibility of local government in sanitation comprise (including wastewater) of: designing and monitoring the construction, regional planning, providing facilities, and environmental management.

From the planning, preparation being developed City Sanitation Strategy (SSK) to local governments have the basis for the development of sanitation for their respective regions.

Challenges|2

Low awareness of the officer and community.

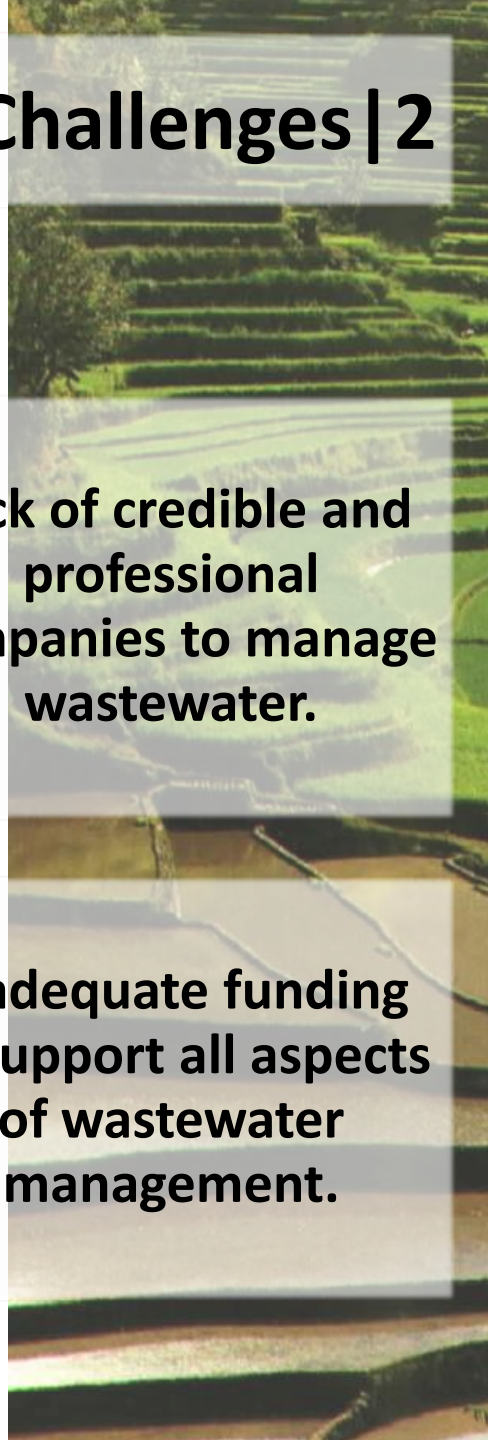
Low utilization of WWTP and treatment plant sludge.

Lack of credible and professional companies to manage wastewater.

Low willingness to pay public water service and the lack of government to cover the full-cost recovery.

Wastewater management master plan not yet available.

Inadequate funding to support all aspects of wastewater management.



Government's Approach to Wastewater Management

Community based total sanitation (STBM) implemented since 2008 until now to manage domestic wastewater by individual approach.

Urban sanitation and rural infrastucture (USRI) to manage domestic wastewater by communal approach.

Centralized wastewater treatment was implemented in 9 cities which handled by PDAM.

Centralized wastewater treatment was implemented in some area (industry, commercial, housing) by private company.

Possible Solutions

Several researches have been conducted on this issue, for example.

Treatment of domestic wastewater by using decorated plant (cyperus alterniforius) (Supradata, 2005).

Bioremediation of wastewater by using water plant simulation system (Yusuf, 2008).

Biodegradation of Tapioca Liquid Waste by Using Symbiotic Action System of Endomycopsis fibuligera and Candida utilis (Pramono, Mulyono and Hartadi, 2009).

Coagulant (such as khitosan, kelor seed, activated *eceng gondok* and activated azolla) and natural absorber (active carbon, activated skin of peanut, and tea-wastes) or combination of them, is effective to reduce content of carcinogenic heavy metal in industrial wastes up to 40%.