

Capacity Development Project on Safe Use of Wastewater in Agriculture (WHO, UNW-DPC, FAO, UNEP, UNU-INWEH, ICID, and IWMI)

Country Reports/Papers

Wastewater production and treatment:

With an expected population in 2011 close to 250 million people, Indonesia is the world's fourth most populous country. The availability of water percapita in Indonesia is 15.500 m³/capita/year. In Java Island as one of top five largest island, where inhabited by 65% of total population, only occupy 4.5% of total water supply 30, 569 million m³/year. This is not enough for water supply up to 2015. Water resources for water supply such as rivers, lakes and other water bodies, has been decreasing considerably over the past few years because of water pollution from many sources.

In Indonesia only around 25 percent of wastewater is being treated mostly at the primary level prior to disposal and the remaining 75 percent of untreated wastewater is discharged into the rivers or other water bodies. Volume of domestic wastewater increased by 5 million m³/year, which contains 50% of pollutants. Based on data from many literatures, about 60-70% of water used by urban people is disposed to the ditches and rivers without treatment. Instead of protecting water resources from pollution, we need implemented usage of wastewater or wastewater reclaimed such as safe and productive use of wastewater in agriculture.

Wastewater management category in Indonesia are domestic wastewater, industrial wastewater, and liquid health care waste. Wastewater from different sources has specific risk level such as domestic wastewater contains of organic compounds and pathogen, industrial wastewater from industrial contains of heavy metals and hazardous, and liquid health care waste from health care facility contains of heavy metals and pathogen.

System of wastewater treatment available on two models 1) onsite and 2) centralized/off-site. Both this models operated for domestic and industrial wastewater and also liquid health care waste as septic tank, plant remediation, bioremediation, fermentation, wastewater treatment plant.

Policies and institutional set-up and needs for wastewater management:

Each category of wastewater has different approach because of different set-up handling wastewater treatment institutional. In order to fulfill their basic right to shelter and environment feasible in accordance with Section 28H of the 1945 Constitution, the government has facilitated the provision of low-income housing and provide support provision of basic infrastructure and settlements, such as drinking water, wastewater, waste and drainage. For the construction of waste water, 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).

Those achievement are result of the construction of the network and wastewater treatment plant in 217 communal city/county. In 2004-2009 period, centralized wastewater system construction urban scale has also been conducted in the city of Denpasar, which has contributed to the proportion of households served with centralized wastewater systems urban scale to 1.65 percent. From the planning, preparation being developed City Sanitation Strategy (Strategi Sanitasi Kota/SSK) to local governments have the basis for the development of sanitation for their respective regions.

Government policy direction in Medium Term Development Plan (RPJMN) 2010-2014 are 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 which include the preparation of supporting regulatory Law No. 18 Year 2008 on Waste Management. Government will also increase the coverage of drinking water, waste water, waste and drainage through the optimization of existing systems; additional acceleration system capacity and water house connections, both based communities and institutions, increasing the use of appropriate technology order; management of water utilization using rate instruments; accelerated development of urban and rural sanitation consists of the development of a centralized wastewater system (off-site) urban scale and communal, improved management of the local wastewater system (onsite), community-based waste water treatment without subsidies, increased utilization of appropriate technology; increase capacity transporting waste into TPS and TPA; construction of new landfill a sanitary landfill, and construction of drainage channels especially in the strategic urban.

Developing alternative sources of funding for water development drinking water, wastewater and solid waste, through the provision of subsidies in rates Public Subsidiary Objects (PSO) forms for low income people; granting bail subsidized credit and interest margin on lending taps; incentives performance-based (output-based aid) for local governments more prioritize the development of drinking water and waste water; giving reciprocal grants (matching grant) for local governments more prioritize sanitation development; issuance of financial instruments through the capital markets; development of financing schemes comes from public funds, as well as the provision of fiscal and non-fiscal incentives for businesses involved in the construction of drinking water, wastewater and waste. Provide funding for the development of drainage system as well as the operation and maintenance of infrastructure and facilities adequate drainage.

Research/practice on different aspects of wastewater:

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

- Treatment of domestic wastewater by using decorated plant (*cyperus alternifolius*) (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%.
- Etc.

Status and need for the knowledge and skills on the safe use of wastewater:

Nitrogen, phosphorus and potassium enriched wastewater when handled and use safely help adding nutrients to the poor agricultural quality reducing needs for artificial fertilizers. Artificial fertilizers often have remained as sources or causes for land, water and food contamination in communities causing significant health problems. Technology on wastewater treatment and reuse, correct handling of treated wastewater for agriculture and selection of food crops remains crucial to meet public health needs and acceptability and sustainability of schemes.