

Water Management Pollution Policy in Indonesia

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Abstract

The main problem that environmental developers is currently facing are the increasing water pollution, decreasing water quality especially in major cities, increasing marine and coastal ecosystem damage, threat to biodiversity, lack of clean water resources in some urban cities, the lack of laws concerning the preservation of the ecosystem, and the low public awareness in preserving the ecosystem. The uncontrolled changes made on the land have caused an almost irreversible damage in water containment areas on river basins. These damages are indicated by the increasing amount of floods and landslides happening around Indonesia, also the opening of forested areas around the water basins cause the sediment to easily erode during rainfall thus causing the water in the rivers to be dirty and the quality to decrease. From the development sector, the decrease of quality in the river waters are mostly caused by pollution from industrial and domestic waste, the damage has gotten severe enough that the Government has commenced a nation wide effort to save water sources around Indonesia. In the effort to realize the repairs on the ecosystems quality, The State Ministry of Environment has decided on a Water Pollution Management Policy as stated in its Strategic Planning for the year 2005-2009. Some of the programs that is being done by The State Ministry of Environment are Clean River Program (PROKASIH) and Program for Pollution Control Evaluation and Rating (PROPER) program which urges the industry to obey so they do not discard their waste into the river, and Clean City (ADIPURA) for processing solid domestic waste. These programs are hoped to decrease or if possible outright stop the pollution in the rivers of Indonesia.

Introduction

Water is resource that is undeniably needed and necessary for humanity in their everyday activities. Humanities need upon water grows higher as time goes on. This is caused by human kind always constantly finds ways to improve their livelihood, the higher the livelihoods of a human so will the usage of water increases. Water also happens to be the one of the main economical backbone for many countries around the globe. Water as a resource is the basis for the farming sectors, energy, and the important part in a cities infrastructure, health and other various functions in the society.

The drastic increase or decrease of water, floods and droughts for example, are the main problems in water resource management. These conditions are caused by a variety of hydrology cycles that is influenced by the changing weather pattern and the way land is used especially near river basins that act as water reservoirs. Floods are considered as a natural disaster that causes great destruction for the countries living and economical sections. Droughts severely limit the

usage of water, especially for the use of irrigation which causes widespread damage for the farming sectors, energy production, tourism, and other sectors.

Meanwhile the decrease in water quality is caused by pollution from industrial waste, household, and farming. The uneven urbanization also adds the problem of the continued deterioration of the cities water quality. .

Realizing that water is very vital resource for an individual, the people and even the country , therefore water resource management envelopes the aspects of water protection that includes within it technical, institutional, laws, the participation of the people, also the upholding of the laws.

This paper expounds the problems concerning the quantity and quality of water in Indonesia, and also the policy on the preservation and pollution control on water resources.

The Degradation on the River

According to the data from Metrology and Geophysics Office in the year 2006, shows that the potential of the rainfalls is estimated to reach 4.6×10^{12} . From that amount only 308 million m^3 have the potential to infiltrate the ground and reach the underground water reservoirs, the rest which is the larger amount will flow into the river. The total volume of river waters in Indonesia in the year 2004 is estimated to be more then 1 billion m^3 .

Forest, lakes, marshes, and minor water containment areas are locations that possess the function of holding and absorbing rain water so that the natural water reservoirs will stay stable from time to time.

The data from the Indonesia's 2001 environmental statistics shows that during 1994-1999 the decrease of forest level has reached 6 million km^2 . The largest decrease in forest level happened in Sumatra stated around 3 million km^2 , followed by Sulawesi estimated at 1.2 million km^2 , Kalimantan estimated 886 thousand km^2 , and Maluku-Papua estimated at 679 thousand km^2 .

On the other hand, the increase in land usage for non-agricultural (housing, industry, etc.) have risen, notably on the island of Java as large as 270 thousand km^2 and 222 thousand km^2 on the island of Sumatra. Besides the forest, the changing function of the minor water containment areas and marshes, from containing water, into housing areas and industry have also risen, this is especially true around metropolitan cities, some of the most noted ones are Jakarta and Surabaya. Inside the Jakarta, Bogor, Tangerang dan Bekasi (JABOTABEK) area. The amount of minor water containment areas, which in the year 1990 still existed 218, only stands around 50-100 at the year 2002.

The damage caused to the water containment areas, created because by the changed use in the land around it, causes the steady flow of water that can be used for a variety of needs. During the rain season the flow of water goes directly into the river then the ocean without having the chance to penetrate the soil thus creating flood because the river can not contain it, and also as a result of the rain water not being absorb by the soil will cause drought during the dry season. By

monitoring the water flow levels of the Citarum river that was done during the dry season, shows an extreme decrease in water flow level, from 6.35 m³/s at the year 1995, becoming 5.70 m³/s on the year 2000, on the other hand during the rain season the water flow levels increase dramatically, from 217.6 m³/s during 1995 menjadi 285.8 m³/s at the year 2000.

Besides that, the damage done on water containment areas will cause the lakes and basins to become shallow, lessening its containment capability, Sentani Lake at the Papua province for example, since 1999 have become shallower at an approximate rate of 5 meters a year. The same thing happened to Tondano Lake at the North Sulawesi province, whereas the year 1970 the maximum depth of the lake reached 50 meter, during the year 2002 it was recorded at 10 meter.

The damage done to the water containment areas added with the excess excavation of underground water have caused a severe decrease in the levels of underground water reservoirs causing earth depressions on several of Indonesia's provinces, even ocean water intrusion have is happening because of the excess excavating of underground water reservoirs, the area near the shorelines of Jakarta, Semarang, Denpasar dan Batam. The widening of the decreasing cone of underground water reservoirs in the Bandung basin, and the case of earth depressions in Jakarta, just happens to be the worse cases from the usage of underground water reservoirs without paying attention to the conservation aspect. The data from the Environmental Geologic Plan for the year 2000 have showed that the decrease of the underground water aquifers in the middle of the Bandung basin reaches 50 m between the years 1985 unto 1997; meanwhile in shallow area aquifers the decrease is estimated to have reach 1 m/year especially in industrial areas. The case of earth depressions caused by the combination of the geological impact, damage in water containment areas, aided by the uncontrolled pumping of the underground water reservoirs is also happening in Bandung. In Jakarta the decrease of water levels from the underground water reservoirs have reached 17 meter and the depressions having a depth of, or even more then 80 cm in West Jakarta area.

Water Pollution

The pollution of surface water and underground water reservoirs are commonly caused by industrial, agriculture, and household activity. In the year 2004 there are around 9600 middle-to-heavy industries that potentially can pollute surface water and underground water reservoirs. The amount decreases around 3% compared to the number of middle-to-heavy industries in 2001. Meanwhile the amount of small-scale industries with the potential to pollute surface water and underground water reservoirs is numbered at 134, the amount increases by 14% compared to 2001. in East Java for example, to be exact, in the rivers of Surabaya, the parameters of BOD and COD tends to increase, this matter is connected with the existence of 28 middle to heavy industries that have become a priority for pollution control. Another example of the growing industrial waste levels that enters the Siak River in the Riau province, which one of the cause is the operation of 25 middle-to-heavy industries. Besides middle-to-heavy industries, small-scale industries also contribute to the pollution inside the rivers water, putting in mind the weakness in its capital and spread, it's a small chance for them to be equipped with a waste water recycler Water Treatment Plant, so it can be assured that the decrease in the rivers water quality is also caused by small-scale industries, tofu, tempe, tapioca, and fish processing industries to name a few. The river quality in Jakarta usually does not fulfils the accepted quality level whether it is B,

C and D class which mainly is caused by waste that came from industrial processing activities, who churns out 3,2 million m³ of waste a year , the liquid waste from agro-industry is numbered at 216 thousand m³ a year.

In metropolitan cities like Jakarta, Surabaya and Medan, the decrease in the river water quality is also affected by the liquid waste from households. According to the 2004 census data from BPS, nationally there are still 22% of households that does not poses proper toileting, which in turn can potentially pollute public waters, 59% is located on Java Island alone. Besides that, nationally in the year 1999 the amount of buildings that is constructed on the river bed has increased approximately 38% compared to the situation in the year 1996. The increasing numbers is an indication of the raising level of pollution from household wastes into the river. The amount of liquid domestic waste that entered the rivers inside the Jakarta area is estimated around 67,3 million m³ a year.

Besides the industry and households, the use of chemical fertilizers and pesticides on the agricultural sector are also potential pollutants, especially on surface. In the year 2004, the use of non-organic fertilizers and pesticide for the agricultural sector reaches an amount of 1,5 million kg and 109 thousand kg respectively. Residue from the fertilizers and pesticide will mostly end up in the river water.

The monitoring of the underground water quality in a few locations at Jakarta, Tangerang dan Serang have shown that a large amount of them can not be used as a source of drinking water. The pollution of Jakarta's underground water reservoirs are mainly caused by the *Coliform* and *Fecal Coli* bacteria. This is caused because around 55% of the household in Jakarta possesses an underground water reservoir whose distance to the nearest waste disposal unit have a distance of less then 10 m.

Policy on Managing Water Resources.

The strategy on managing water resources should be aimed for conservation, or if possible, the increase of an areas support ability from the availability of water resources. This effort must be done by paying attention to waters multifunction ability, which is the ecological, economical, and social function. For that water management must be integrated, cross sectored, while considering the projection on the growth of people for every sector, and the sectors development plan. In the year 1999, the government have started to reform a number of laws that are connected with water resources management.

In accordance with the proposed laws connected with the water resource management, The State Ministry of Environment have given a few matters that are severely stressed upon, some of them are:

1. The principal of a continuous, efficient, area supported, cautious usage, and a commitment to increasing access to clean water sources for the mass.
2. The Clarity between the level of authority among the central government and the area governance.
3. The guarantee upon the right of a citizen of the country for an availability of clean water sources, to receive information, to partake in making a decision, and also paying attention to needs of the people from a local area and local initiative.

The State Ministry of Environmental Strategic Program

Besides the policies already stated before, at 2002 The State Ministry of Environment have positioned several strategically placed programs that are connected with continuous water management, some of them are the Company Environmental Performance Rating Assessment Program (PROPER) and Clean River Program (PROKASIH).

Between 2003 until 2006, 249 licensed companies that are distributed on 7 provinces have signed an enclosed contract to participate in PROKASIH. Up until the year 2005, 25 companies have been acknowledge to have completely followed the rules that are enclosed in the contract

Besides the manufacturing industry, up until the year 2006, 56 agro-industries that are distributed on four provinces have also participated in PROKASIH. The results that are monitored on the year 2006 have showed that from 49 industries, 65% from the amount mentioned have showed that they have a good performance, whereas the water quality for the BOD parameter is under the limit.

The Government, starting from the year 2002, through The State Ministry of Environment executed another program that is called PROPER, with the main goal to maximised PROKASIH. One of PROPER'S activities are spreading information to the masses about the level of organized performance of a company.

That basic principle of PROPER is to push a company's organization in managing the ecosystem, through a reputation based incentive, for companies that possesses a good performance on ecosystem management will also get a good reputation, for companies with a less then satisfactory performance on ecosystem management will also gain reputation, though it will not be a good reputation. The performance level is categorized in 5 levels of colour, from the lowest: black, red, blue, green and finally gold. Those five colours will describe the performance of a company on ecosystem management.

In the year 2006, the companies that participated in PROPER are numbered at 520 companies, is composed of 254 manufacturing industries, 15 service industries, 101 agro-industries, and 149 mining, gas, oil and energy industry. Specifically for the water pollution control, in the year 2006 as much as 199 companies have been categorized on fulfilling the requirements, they are 86% from the manufacturing industry, 6,5% from the service industry, and lastly 7,5 % from the agro-industry.

Although, because the participation of PROPER is voluntary in nature, the amount of companies which follows the program is relatively not significant enough compared to the amount of companies with the potential to ruin the ecosystem, the amount of companies who adhere to the laws are also very little, besides that, the reputation based incentive, without any economical incentive, tax reduction for example, will not be enough to give some companies to participate in the PROPER program. Further more without any sort of serious reprimand and enforcements of the law, the continuous destruction and pollution on the water will be severely, or even impossible to stop

The reuse of water is done with the expectation on shortening the hydrology cycle and the

conjunctive use of surface water and groundwater, by making use of the available technology, must be made a chosen method in the continuous water management in Indonesia. Besides that, the adaptation of the strategic whether change program, must be implemented immediately. All programs and can be effectively implemented especially if the entire layer of people in the country understands the necessity and participated actively.