

Separating Drainage as an Alternative for Small Municipal Water Treatment

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ORGANIZATION OF PRESENTATION

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BACKGROUND

The waste water from the municipality was the one problem that must be solved in Indonesia. Most of the municipality areas in Indonesia has no permanent waste water treatment. Waste water from the household was directly flowing into the drainage channel system. The drainage system in many areas in Indonesia were mixing system, where the rain water and the waste water were flowed into the same drainage channel.

Problem was occurred in the dry season, where there was not enough rain water available to flush the waste water. Waste will be stagnant in the drainage channel and the stagnant waste water in several days will cause bad odor and the color will be changed into dark color with some flogs occurred in the waste water. This condition will cause the decreasing of health and esthetic level.



AIMS OF THE RESEARCH

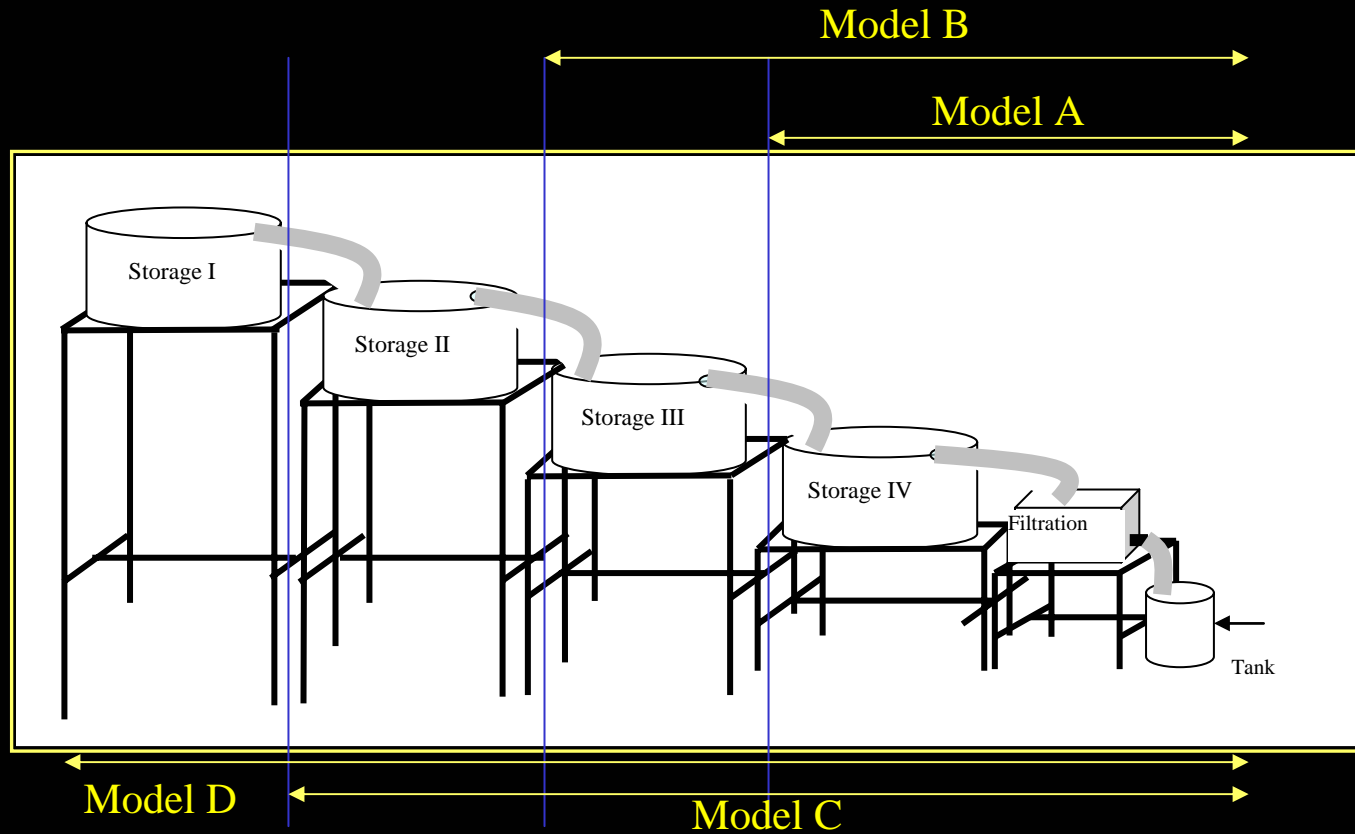


As a developing country, Indonesia has a big and high density of population. It was very difficult to find an open area to construct a complex waste water treatment. On the other hand, the government role, in this case regional government, was very few to support budget and effort to maintain such kind of problem.

It was very important to find the method of the waster water treatment which fulfills the conditions of the ideal municipal environment concept. The method of water treatment must be small, simple, inexpensive, and easy to maintain.



RESEARCH METHODOLOGY (LAB EXPERIMENT)



RESULTS AND DISCUSSIONS

The experiment indicates the decreasing of turbidity in the waste water.

Model	Turbidity of Untreated Waste Water (NTU)	Turbidity of Treated Waste Water (NTU)	Turbidity Reduction (%)
A	43.53	20.93	51.19
B	44.30	17.40	60.72
C	8.83	2.20	75.09
D	78.40	11.50	78.40

RESULTS AND DISCUSSIONS

The Model D was implemented in the 3000 m² new area of neighborhood in Malang City, East Java. The area consists of 15 households with discharge of waste water produced from the household was calculated by using assumption that in every household was occupied by average 5 people.

The combination between the cascade storage as the beginning process of the treatment and the zeolite slow sand filtration at the end of process was resulting the suitable condition for water that will flowing into the drainage system according to the scale modeling research. Result showed that the turbidity was decreasing from 45 NTU to 5 NTU, where the minimum water quality standard for the drinking water for the turbidity is 7 NTU. The odor of the waste water was removed and the water became no taste.



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RESULTS AND DISCUSSIONS

This research was a simple sample that can be conducted in the small neighborhood, where the system of water treatment combined with drainage channel for rainwater can be effectively implemented to prevent the decrease of water quality level in the river.

Simple cascade storage tank with the carbon active or zeolith slow sand filtration was the one of treatment plant that can be implemented. This simple plant can be removing the odor and decreasing the turbidity that containing in the waste water. Although the purpose of this waste water treatment was very limited, as the simple waste water treatment solution in Indonesia, this system was suitable as the first stage to promote the water environmental awareness of municipality in Indonesia.



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CONCLUSIONS

Separated system of water treatment for household waste water and drainage channel for rainwater is potential to prevent the decrease of water quality level in the river.

Research related to a simple and inexpensive waste water treatment design is very important to do in order to support the larger research related to the water and environmental protection.

The government has to have more concern about waste water treatment in household scale.



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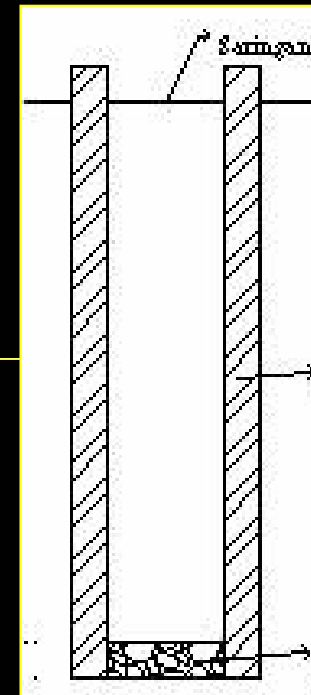
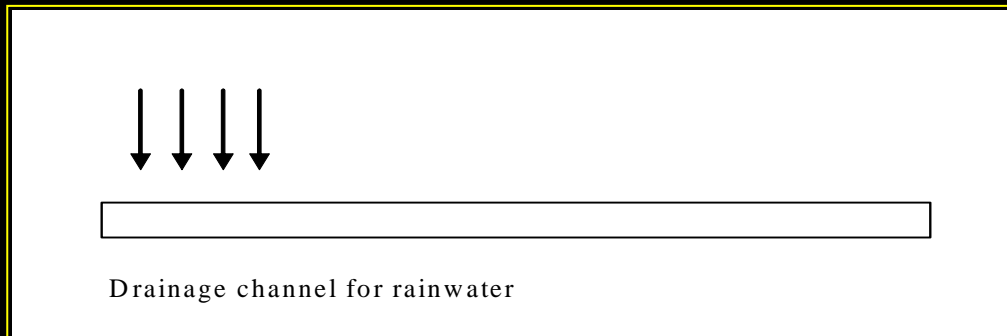
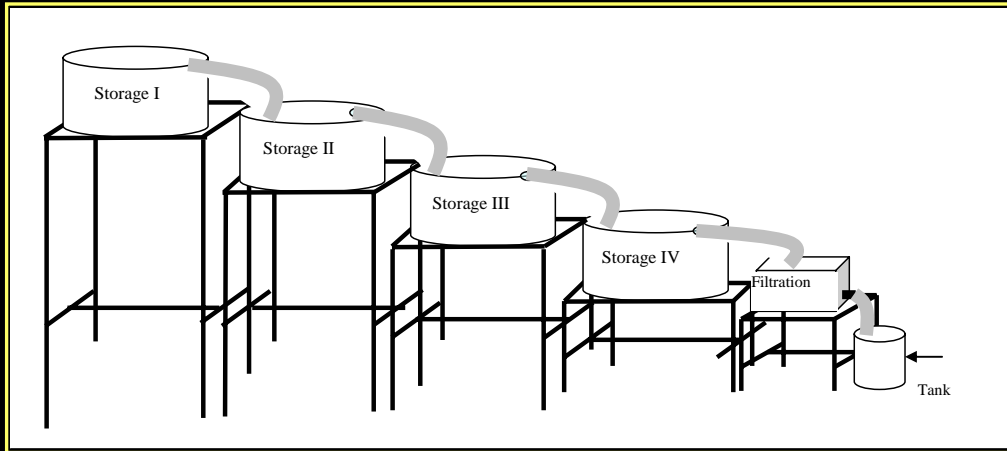


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FUTURE RESEARCH



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RELATED RESEARCH

Managing water from river
for domestic water supply
in rural area

Managing low quality water
for water supply for religion
purpose in urban areas



The Dream of Takachiho

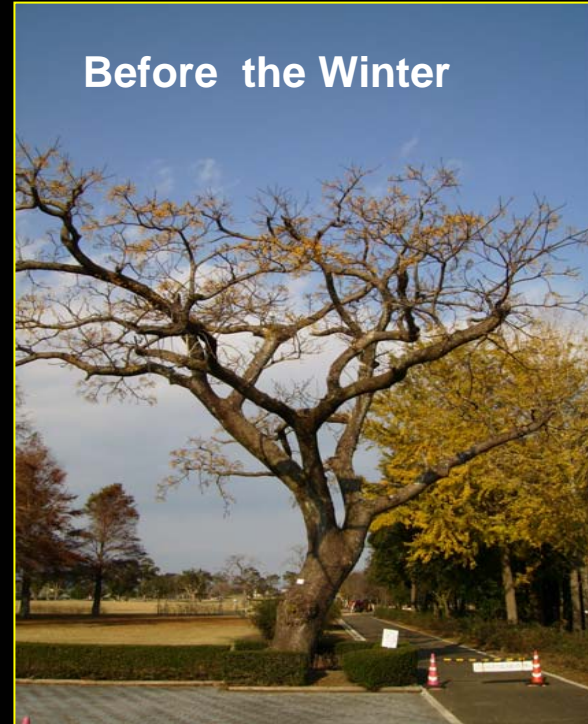


It will be pleasant standing behind the Takachiho waterfall. This photograph was taken from the boat sailing in the Takachiho gorge. The beautiful place where life running well such as the dream. Beyond the water fall shading water and look at to the bridge just as looking at the place in the other of dimensions, the dream dimension.

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Before the Winter



The picture was taken before the winter came to the Miyazaki. The time when the leaves was fallen from the tree, and leaving the tree with only by their branches and twig. Just like the open hand hoping some miracle come from the sky



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