

Excessive Waterlogging Prevention at Urban Built up Area based on Land and Water Conservation Model

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[https://doi.org/10.35609/gcbssproceeding.2023.1\(201\)](https://doi.org/10.35609/gcbssproceeding.2023.1(201))

ABSTRACT

Water resources management needs to consider the biophysical characteristics of the area. The majority of Kupang City's geological features are dominated by porous karst rock structures. Unfortunately, during the rainy season, some parts of the areas frequently experience floods. Additionally, the future risk of drought is amplified by uncontrolled deep groundwater extraction, which is aggravated by imbalanced groundwater recharge. On the other hand, visual observation results show that in the rainy season rainwater surface runoff immediately flow off to the downstream areas through open land use and mostly via street body and/or roadside canals nearby. This study aims to increase urban planner and community participation in land and water conservation measures by optimizing the plot of land for their socio-economic activities. The proposed land and water conservation model is based on previous research's results i.e., that the high infiltration rate in Kupang City is an opportunity for deep groundwater recharge, and the provision of minimum open land is needed to absorb and plant productive vegetation. This study is important because the Indonesian government has not been producing the land or water conservation standard in urban built-up areas, so does the model of sustainable drainage infrastructure in urban built-up areas. Similar situation may also occur in other developing countries. Thus, appropriate land and water conservation efforts are strongly needed, institutionally and systematically.

Keywords: Built up area, land and water conservation, infiltration and percolation rate, sustainable drainage system; zero run-off concept