

Coastal Reclamation and Heaping Fishpond Causing Land Subsidence in Semarang City Increase

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YOGYAKARTA- Semarang City is one of big cities in Indonesia. The city had a total area of 373.4 km² with a population of 1,481,460 inhabitants in 2008. Viewing from the geographical condition, the southern part consists of hills and structural denudational volcanic hills, while the alluvial plain is located in the north.

Along with the increased population, to meet the needs of residents and industries, construction is conducted in which land preparation is performed by, among others, heaping fishpond and coastal reclamation. This activity is one cause of continuous increases of land subsidence. "The impacts of land subsidence are, among others, the inundation in the settlements located by the beach, damage to houses and settlement infrastructure and the potential occurrence of disease," Ir. Soedarsono, M.Sc., said in his dissertation that was presented in doctoral exam of Environmental Science Program at UGM Graduate School, Saturday (7/5).

In the dissertation entitled *Effect of Land Subsidence to the Environment Settlement in Alluvial Plain of Some Regions in Semarang City*, Soedarsono explained that his research adopts survey and laboratory methods. Evaluation of land subsidence is through overlay map of land carrying capacity, alluvial sediment thickness, thickness of soil deposits and the decline of ground water, the result of which is land subsidence map. Furthermore, the land subsidence map is overlaid with that of year 2000 and the result is a map of land subsidence evaluation. "Research was conducted at houses in villages of Tanjung Mas, Bandarharjo, Kuningan, and Dadapsari consisting of permanent, semi-permanent and non-permanent houses," the Secretary of Civil Engineering Magister in Unissula Semarang said.

On the results of his research, Soedarsono said the change of land use from the fishpond into residential areas by heaping 2-4 m influences on land subsidence. More to the north (the sea), the thicker pile, the less land carrying capacity, the thicker alluvial deposits and the deeper ground water surface inundated.



Meanwhile, the puddle in the settlement occurs in the vicinity of rivers and drainage channels, while rain and the tide go into the settlement through Asin River, Semarang River, Baru River and Banger River. On the other hand, efforts to overcome the puddle with polders and 54 units of pumps from Semarang municipal government and residents have not fully succeeded in overcoming puddling. "Well, the water that pooled in the settlements will not only damage homes and other infrastructure but also lead to the emergence of diseases, such as diarrhea due to dirty environment," the man born in Salatiga, June 20, 1953 explained.

Increase of land subsidence covers 270 ha can also be found in the residential area of Puri Anjasmoro from small subsidence (0.00 to 0.10 cm / yr) to medium subsidence (0.10 to 0.20 cm / yr) for 9 years. Increase of land subsidence area of 496.50 ha of in the Marina neighborhood, Indoperkasa, and PREP, from medium subsidence (0.10 to 0.20 cm / yr) becomes large subsidence (<0.20 cm / yr) for 9 years, and the occurrence of the addition of puddle in the residential area of 29.62 ha for 14 years.

By looking at these conditions, Soedarsono proposed some suggestions, namely controlling settlement construction (real estate), especially for the fishpond area with the permission of the municipal government of Semarang to reduce land subsidence, controlling the puddle in the settlements due to rain, local rainfall, and sea tides, by increasing the polder's capacity in the lower surface.

After passing the exam in front of examiners team consisting of Prof. Dr. Hartono, D.E.A., D.E.S.S., Prof. Dr. Sudarmadji, M.Eng.Sc., Prof. Dr. Ir.Sunjoto, Dip.H.E., D.E.A., Prof. Dr. H.A. Sudibyakto, M.S., Prof. Dr. Ir. Kabul Basah Suryolelono, Dip.H.E, D.E.A, Dr.rer.nat. Muh. Aris Marfai, M.Sc., Prof. Dr. Sudharto P. Hadi, M.E.S. (Rector of Diponegoro University), and Prof. Dr. Sutikno, finally Ir. Soedarsono, M.Sc. graduated with honors. With this result, Soedarsono became the 1387th doctor of UGM.

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