

Agriculture and brackish fishpond impact on the vulnerability of coastal groundwater in Southeast Asia

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Brackish fishpond and agriculture are commonly found in the rural area of a developed country in Southeast Asia, such as Indonesia. Both activities are believed could leverage people's welfare. On the other hand, they are potentially increasing groundwater vulnerability. The use of fertilizer and low quality of irrigation water may become a risk to groundwater quality. Moreover, the intentional addition of seawater to brackish water pond is suspected will contribute to high groundwater salinity. We select Indramayu, which is located in the north part of West Java Indonesia, as our research area because this area is very important with the production of rice and brackish fish. As yet, in-depth research about groundwater vulnerability caused by those two activities is still limited. Through this research, we evaluate the potential risk of agriculture and brackish fishpond to groundwater quality. We collect 50 samples in two periods from the coastal groundwater (46) that representing all types of land-uses, and river (4). The samples from groundwater represent all types of land-uses in the area. Then, we analyze major elements, nutrients, water isotopes, and sulfate isotopes to evaluate the risk. The results of this study are very useful for maintaining groundwater sustainability in agricultural and brackish ponds of coastal areas.

Keywords: agriculture, brackish fishpond, coastal groundwater, vulnerability