were affected by *vadose* layer, then by itself, *vadose* layer thickness also affected the duration of the process of capillary shock, and influenced the magnitude of the decline in groundwater levels due to the capillary shock. In this study, the influence of the thickness of the *vadose* layer has been unimplemented yet because it is difficult to condition the research in the field that allows the observation and measurement of the thickness of the layer of capillary water. Research on the influence of the thickness of the *vadose* layer also implemented in the form of experiments simulation in hydrology laboratory; they are carried out simultaneously with the research on the influence of soil particles to the decreased water level.

IV. Conclusions

Increasing capillary pressure triggered the phenomenon of decline in groundwater levels in the early period of the rainy season due to declining the pore diameter after the water level began to infiltrate into the surface layer of soil on the *vadose* zone. Increasing capillary pressure caused the attraction of the groundwater in the saturated zone in the vertical direction, so that the groundwater level has decreased significantly.

The low groundwater levels did not occur in the climax period of the dry season, but it happened in the early period of the rainy season. It took place at the top of the dry season was the capillary pressure conditions in the lowest layer of the soil. This was caused that the pore diameter reached the maximum condition, due to evaporation during the dry season.

Groundwater pumping did not solely cause the saltwater intrusion into fresh groundwater zone, but it also can be caused by subsidence of groundwater for each early period of the rainy season. If the decrease in groundwater level were not able to be recovered during the rainy season, hence the existence of saltwater into fresh groundwater zone would be permanent, and every year will increase. The low capacity of infiltration and percolation due to damage the surface soil layer also became one of the triggers of the saltwater intrusion.

The influence factor of the number of points added to the capillary shock capacity in groundwater needs to be further investigated. This is important because if it is true, the artificial recharge can contribute to shortening the time and capacity of the capillary shock, then the implementation of artificial recharge in prone areas affected by the intrusion will be a useful alternative solution.

The influence factor of the soil particles to the capillary shock capacity on the groundwater also requires the careful studies. It is also important because if this factor is affected by the duration and capillary shock capacity, they will help experts in manipulating the soil water conservation system, especially in efforts to prevent saltwater intrusion.

The influence factor of vadose soil thickness located above the capillary water level towards the capillary shock capacity also requires careful studies. This factor is important because if this factor is affected the duration and the capillary shock capacity, it is beneficial to those skilled in manipulating the soil water conservation system, especially in efforts to prevent saltwater intrusion and restoration of groundwater reserves in the free aquifers that are close to the ground.

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