Effect of climate change and sea level rise on taking water ofSouthThaiBinhirrigationsysteminVietnam

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ABSTRACT

Vietnam is one of the most vulnarable countries affected by climate change and sea level rise. One of the consequences of climate change and sea level rise is the increase of salinity intrusion into the rivers which is challenging to irrigation systems in coastal areas. This indicates the necessary to study the ability of taking water through sluice gates of irrigation systems in coastal zones, especially in the dry season with the effects of climate change and sea level rise in the future.

In this paper, Nam Thai Binh irrigation system is selected as a case study. The irrigation system is one of 22 biggest irrigation systems of the Red River delta in Vietnam located in coastal region. The computed duration is selected in dry season to irrigate for Winter-Spring crops. The irrigation water for the study area is taken from different sluice gates along the Red River and the Tra Ly River.

In this paper, MIKE-11 model was applied to assess the ability of taking water for irrigation of the study area in current situation and in the context of climate change and sea level rise senario in 2050 (under the medium emissions scenario (B2) published by the Ministry of Natural Resources and Environment of Vietnam published in 2012) with different condition of water availability. The operation of the gates depends on the water levels and sanility conditions. The sanility and water level at different water intake gates of Nam Thai Binh irrigation system were simulated with different senarios with and without climate change and sea level rise. The result shows that, under climate change and sea water level rise, some gates can take more water but some can not take water because of salinity excess and the total water taking from the different gates along the rivers decrease while the water demand is increase.

The study indicates the necessary to study quantitatively some recommended solutions in the study area particularly and in coastal region generally in Vietnam to ensure water demand for irrigation and other purposes in the context of climate change and sea level rise in the future.

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