EVALUATING THE EFFECTS OF SALINITY INTRUSION ON THE AGRICULTURAL LAND USE IN THANH PHU DISTRICT, BEN TRE PROVINCE, VIETNAM

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Abstract: Thanh Phu is a coastal district of Ben Tre province, located in the East of the Vietnamese Mekong Delta, between two rivers namely Ham Luong and Co Chien and covered 25 km of coastline adjacent to the East Sea. This is one of the great advantages of socio-economic development. However, the impact of climate change in recent years, especially saline intrusion has greatly affected the agricultural production in this district. According to a report on the general saline intrusion of Ben Tre province in 2016, it was found that the salinity line at the peak of 4‰ in major rivers penetrated to a depth of about 45-65 km, the saline boundary 1‰ penetrated to a depth of over 70 km. The salinity measured at Ham Luong river in Phu Khanh commune, Thanh Phu district about 25 km from the river mouth is 6.9‰. As of early March 2019, the saline intrusion has damaged about 13,844 ha of winter-spring rice (over 90%), the damaged crop area is 503 ha. The total number of households affected due to lack of freshwater for daily life is 88,208 households with over 353,000 people, most of them are people in 03 coastal districts, poor households do not have conditions to equip and reserve water. As one of the three coastal districts, Thanh Phu has been facing the impacts of saline intrusion caused by construction. Therefore, the research aims to analyze the effect of salinity intrusion on the agricultural land use of the households in Thanh Phu district, Ben Tre province, Vietnam.

The land use map in Thanh Phu district in the period 2014-2019 was used to extract the agricultural land use. An overlap method in GIS was used to assess the change of land use in the period 2014-2019. In combination with a household interviewing (90 households) and experts interviewing method (05 peoples) to analyze the current situation and impact of salinity intrusion to the cultivated models in freshwater, saltwater and brackish water.

The results indicate that there were three main farming models in Thanh Phu district including double rice crop, rice-shrimp farming, and shrimp farming (Giant tiger prawn). In which the area of the rice crop was decreased in the period 2014-2019 (from 10,653.40 ha to 6,330.53 ha mainly in freshwater areas), meanwhile the perennial trees and aquaculture land were strongly increased, especially the area of perennial crops increased from 6,509.00 ha to 9,683.30 ha, the area of aquaculture increased from 9,840.00 ha to 11,720.66 ha. Simultaneously, the household interview results also highlighted the salinity intrusion mainly affects the rice crop cultivation in the year 2019, and 2020 in freshwater (more than 70% of surveyed households are affected, in which 16.7% of households suffered damage over 70% of their income) and brackish water regions (more than 70% households affected). Shrimp farming is less than affected by salinity intrusion in both saltwater and brackish water. The area and production of rice decreased gradually, while the area and output of other crops and aquaculture increased very positively compared with the restructuring plan. Research outcomes provide information to aid the management of agricultural activities and land use orientation under impact of salinity in this district.

Keywords: Agricultural cultivation, salinity intrusion, Thanh Phu district.