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1. Background

Climate change poses risks to human and natural systems on a global scale. Sea level rise caused by the melting of ice caps and the increasing occurrence of droughts and floods are the most important risks associated with global warming. For every degree of global warming, the sea level is expected to rise more than 2.3 meters (2, 23). Throughout the 21st century, coastal ecosystems and low-lying areas will increasingly experience adverse impacts, such as coastal flooding and intensified submergence, causing saltwater intrusion on agricultural land and coastal erosion (23, 24, 51).

Delta areas are also affected by storm surges that drive saltwater upstream (32). Nguyen (36) highlighted that saltwater intrusion can reach a considerable distance from the coastline and affect water use in estuaries. In coastal areas, climate change induced sea level rise causes severe salinization, a situation which is likely to worsen rapidly (30). This results in reduced wetland areas, coastal erosion, and increased salinization of cultivated land and groundwater (33, 12, 43), thereby threatening the livelihoods of people living around the delta and coastal areas.

Over the coming years the average sea level rise in Asia is estimated to be between 1 and 3 mm per year (40). As a consequence, the coastal zones of Myanmar will be increasingly affected, threatening the livelihoods of the local population (38, 28). Accordingly, Myanmar is considered one of the most vulnerable countries to climate change and sea level rise (28). Furthermore, agriculture is highly sensitive to different hydro-climatic conditions and an agriculture-based country such as Myanmar is seriously affected by changing climate and natural hazards. The most productive rain-fed farming areas in Myanmar are already threatened by the rising sea level and salt intrusion (19, 1). Especially in the Ayeyarwaddy delta areas, where agriculture is dominated by rice cultivation, saltwater intrusion and flooding have considerable negative impacts on the livelihoods and socioeconomic conditions of farm households.

Moreover, the rice-growing areas in the delta region are not well protected against periodic saltwater intrusion during the monsoon periods. Therefore, flooding and saltwater intrusion, along with the rise in sea level, are becoming the main challenge for the farming communities in this zone. However, in depth knowledge on the climate change vulnerability of farm households and their adaptive capacity in the delta region in Myanmar is still lacking. In addition, it is particularly relevant to understand the tendency of farming communities towards climate change vulnerability alongside the frequency and occurrence of natural hazard events. Therefore, empirical research on the effects of natural hazards and saltwater intrusion and an assessment of climate change vulnerability of farm households is necessary.

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