平成28年度　環境科学院　修士論文内容の要旨

Assessment of saltwater intrusion in Kien Giang Province, Viet Nam

（ベトナム・キエンザン省における塩水浸透の評価）

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The Mekong Delta in Viet Nam plays a key role in rice production and food security not only for feeding people in the country but also for exporting to the other countries. However, as the Mekong Delta is one of the most severely impacted areas in the world by climate change, the agricultural development of Viet Nam therein is heavily suffered from both fresh water shortage and salinity intrusion in the dry season. Located in the Mekong Delta, Kien Giang Province, one of the most important provinces for the rice production, is also threatened by sea level rise. Salt water intrudes from both the Gulf of Thailand via the long coastal line and complex canal systems, especially and seriously in the dry season. Impacts of climate change have been reported since 2000s, but the practical ways for local people to recognize and cope with the impacts have not been adequately established yet.

This study aims to analyze impacts of salinity intrusion on agriculture in Kien Giang Province, in the climate change context, by applying the ISIS hydrodynamic model, and to provide suggestions on possible adaptation measures.

Methodology applied in the study includes data collection, simulation, analysis and mapping of the salinity intrusion. Salinity data from ground-truth monitoring stations in the study area in 2007 through 2014 were collected. The other data of water flow, water level and water demand in 2007 were collected. The collected data were then processed as input data for the ISIS hydrodynamic model. The model results were further processed with Delta Mapper (floating raster format) and ArcGIS (raster format) and were illustrated in form of different kinds of maps for2007 through 2014. Analyzed maps were produced by logical spatial analysis, comparative analysis and impact analysis.

The results show different rate and duration of salinity intrusion in the study area, which can be further analyzed for suggesting suitable adaptation measures in land use planning and predicting trends of salinity intrusion. Various forms of salinity intrusion maps clarified the situated results, which could expectedly provide scientific knowledge on the impacts of climate change to local people and to support decision makers for better socio-economic future planning. .

Based on the results, the following adaptive measures against climate change were suggested: (1) Further studies on specific halophyte crops in highly salinity intruded areas, (2) Land use re-planning for effective water use, (3) Upgradation and improvement of current infrastructure (irrigation, sluices, operation procedures and so on), and (4) Enhancing awareness and capacity building for local stakeholders based on scientific guidelines such as provided by this study. Accordingly, longer time-series monitoring of parameters related to climate change and subsequent extreme weather events is required to realize more accurate simulation of salinity intrusion.