Integrated Climate Change Adaptation to Manage the Risks of Extreme Hydrological and Weather Events in Data-scarce Nile Delta

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This research is part of the ongoing research project − Climate Change Adaptation to ManagE the Risks of Extreme HydrologicaL and Weather Events for Food Security in Vulnerable West Nile Delta (CAMEL). The study area − West Nile Delta − is an important region in Egypt dominated by agricultural and industrial activities, whilst it is a vulnerable area facing extreme weather and changing climate crises (e.g. flooding, rising temperature, sea level rise) and water resources depletion, and a relatively vulnerable area in Egypt in terms of socio-economic respect. Under the pressure of growing population, food security has become a national issue, which has raised the concerns of the foregoing causes and of the effects from their interactions, particularly in this region. In the latest decade, the region experienced more extreme weather events; the severe rainfall events resulted in flooding destroying massive crops and causing losses of human life and livestock. Adaption towards the environmental challenges has therefore become an urgent demand, such as an early warning system for extreme events caused by heavy rainfall. However, the scarcity of data (e.g. insufficiency in coverage of gauge stations and radar stations) has always been a main obstacle to the development of management tools in Egypt.

Therefore, the research aims to build an integrated flood management system for Egypt. Based on the integration of Nowcasting of satellite precipitation observation and numerical weather prediction (NWP), global data resources are applied (i.e. GPM data and ECMWF analysis/forecast) as the substitution for the insufficient observations of local ground stations. The research expects to end up with a recommendation of policy and a novel tool – real-time flood early warning system– so as to accommodate the environmental problems in terms of the adaptation of climate change.