



Mitigating flood risk in Alexandria with anticipatory flood management

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Alexandria (Egypt), similar to many other Arab cities in the Middle East and North Africa, experiences occasional heavy rainfall and consequent pluvial flooding. For example, the last flood in Alexandria in 2015 led to wide-spread flooding in the city and caused huge damage and distress. The Assessment Report (version 5) of the Inter-Governmental Panel on Climate Change (IPCC) and the climate change impact assessment study of the World Bank predict that the situation will be exacerbated in the future. In the present research we carried out an analysis of the 2015 flood in Alexandria and concluded that a heavy rainfall could have been forecasted days ahead of the flooding event. As a follow up of the analysis we recommended the development of an early warning system to improve the preparedness of the city. The early warning system is seen as a risk reduction measure that will allow buying time to carry out more elaborate studies on larger investments to bolster flood prevention. Before such elaborate studies are carried out we recommend resorting to anticipatory flood management as a mitigation measure. Rainfall forecast and flood early warning system will help us assessing the likelihood of an imminent flood. During this research we have identified water bodies (specifically Maryot and Airport lakes) which can be used as temporary storage bodies. In the anticipation of a flood the lake water may be pumped out into the Mediterranean Sea to temporarily create storage spaces. If flooding does occur then the lakes will be able to store a part of the flood water and can reduce the flooding effect. The analysis of the 2015 flood showed that the flood could have been predicted more than 2 days ahead of time and starting to pump out lake water to the Mediterranean Sea two days ahead of the event would have provided storage capacity of about 0.9 mln m³ to substantially reduce the flood damage. The effect on the lake ecology needs to be investigated. Currently, we are implementing the recommendations of this research with the project Anticipatory Flood Management in Alexandria (AFMA) co-funded by the Netherlands Enterprise Agency of the Dutch Government and the Egyptian Government.

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