

Analysing of Community Resilience to Flash Flood Hazards

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Biography:

Noha Roshdy has 13 years working in the field of water and wastewater in an Egyptian semi-governmental company. Noha worked in GIS for 3 years, then participated as a team assistant in a world bank project for 1 year (ISSIP I). Since 2011 she has worked for Holding Company for Water and Wastewater, first in the R&D department as a research and development specialist and for the last 5 years as an international cooperation specialist. She organized the 2013 international conference for water and wastewater. Noha Roshdy obtained a master's degree in Urban Management and Development - specifying in climate change - from Erasmus University in November, 2017.

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About two years ago (November,2017) I had my master degree in urban management and development from Erasmus University –Netherlands. I wish my research can be useful as it was about how to mitigate or overcome one of the climate change hazards which is flooding and its negative impacts on the cities and communities specially urban areas. In my research I have choose the Corniche area- the City of Alexandria, Egypt because it is one of the most urban areas that is exposed to floods and also ranked by Organization for Economic Cooperation Development recently to be the 1st city that will be severely facing flood risk by 2070.

In response to climate change, the international focus has been mostly focusing on mitigation through the greenhouse gas emissions' reduction, however it has been found now that even the strongest mitigation action alone will not be sufficient to reduce climate change impacts in near future (Saavedra and Budd, 2009). Community resilience has become a key policy issue in order to address climate change impacts, and it has been adopted at all levels such as federal, state, and local levels (Chandra, Acosta, et al., 2011). Resilience is considered to be essential to a community to make it able to reduce the long periods of recovery it needs after a disaster occurrence, as an educated and informed community can act as first responders in an emergency. Putting more emphasis on resilience is in other words focusing on what communities can do for themselves in order to strengthen their capacities, rather than concentrating on the community's vulnerability to risks or environmental disasters (Twing, 2009).

Local communities need to create the capacity to deal with the resulted changes of climate disasters, as it may not be able to control the occurrence of climate related disasters like floods; building resilience includes understanding these changes and creating the capacity to survive with those changes rather than being a prey to them (Saavedra and Budd, 2009). Community resilience is a relatively new term, but its meaning varies across many traditional topics in emergency preparedness (Chandra, Acosta, et al., 2011). The efficiency is critical nowadays in the context of today's resource-limited environment so that communities can identify and leverage the activities that are already in place to further build resilience (Chandra, Acosta, et al., 2011).

The values and behaviour that bond communities and cultures with their environments and cross-cultural resilience need work, and there is a need for more community resilience research focused on the less quantifiable aspects (Adger, Barnett, et al., 2013). (Berkes and Ross, 2013) stated that we don't know how the sense of place, formation of social identity, and stewardship are important for community resilience. In addition there is little in the literature about methodologies. This research will address these scientific gaps and contribute to the body of literature surrounding resilience and specifically

community resilience; it will highlight new research directions and practice toward improving the community resilience of human–environment systems.

My research is focusing in how to analyse the community resilience in facing the flood risk in Corniche area but the Framework developed through my study can be used in analysing community resilience of any other area/city. Herewith, I am representing a brief about my research:

Flooding has been one of the recurring occurred natural disasters that induce detrimental impacts on humans, property and environment. Frequent floods are a severe issue and a complex natural phenomenon especially in urban areas with respect to population affected, environmental degradations, and socio-economic and property damages.

This work aims at studying the impacts of the floods and measuring/ analysing the level of community resilience with special reference to urban cities that are subjected to the impacts of floods resulted from climate change. These floods call for risk assessment and good management for the flash floods.

In this regard, and because of the lack of resilience strategies in community planning development in the urban cities, hence the increase of the inhabitants' vulnerability of these cities. Moreover, the undetermined stakeholders and their responsibilities regarding the reduction of the impacts of floods on this affected zone and lack of coordination, which lead to the incapability of identifying their role in increasing the resilience of the affected community by floods. Specially that the severity of floods is expected to increase in the 2070- according to the recent studies of the Organization for Economic Cooperation Development (OECD), hence, these two problems are expected to increase the vulnerability of urban cities.

This work addresses various techniques applied in an Egyptian mega-coastal city Alexandria. This selection is mainly due to its naturally low topography below the sea level and the rank of the city in terms of population exposed to coastal flooding by 2070 as the 11th among 19 cities according to the OECD. Lately these ranks have been modified so that Alexandria became the first according to recent researches.

Moreover, an index (Floods Resilience Index, FRI) is developed to measure the level of communities' resilience in these mega coastal cities. This index is developed using new Modified Adopted Conceptual Framework (MACF), which based on five resilience capitals: Governance, Economic, Natural, Physical and Social. A Normalized method was employed to measure these capitals using the FRI. The data are collected via in-depth interviews held by the researcher with the relevant stakeholders in the city of Alexandria, in addition to some secondary data like governmental reports and academic literatures.

Furthermore, qualitative multi-criteria analysis is carried out using Microsoft Office Excel and presented using Radar diagram. This analysis indicated that higher values of resilience are correlated with higher preparedness to cope with flood-related disasters and vice versa. It also shows that there are various types of weakness characteristic of Alexandria city. Based on this analysis, recommendations are presented to enhance the community resilience to flood-related disasters. In the overall, FRI performance for the city showed that the highest performance is achieved in the Governance Criteria.

In-depth interviews show overlapping and lack of coordination in the responsibilities of possible stakeholders regarding the reduction of the impacts of floods on the affected selected zone. The findings of this work showed clear determination for the concerned stakeholders to enhance their responsibilities, increase the availability of cooperation efforts between them, especially between the government and academic representatives and between the academic representatives and NGOs. This will increase social awareness to flood disaster in Alexandria, leads to the effective participating between the community individuals, government, NGOs and academics to enhance the community resilience to floods.

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