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FROM AWARENESS TO ACTION: ANALYZING ENVIRONMENTAL ATTITUDES AND HUMANITARIAN RESPONSE IN NAIROBI METROPOLIS

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Abstract: As urban areas continue to expand, the frequency and complexity of urban flood incidents have risen worldwide. Recent events in various countries, including the United States, Australia, Brazil, Pakistan, Scotland, Sri Lanka, the United Kingdom, and several African cities, such as Accra, Kano, Kampala, Maputo, Bujumbura, and Nairobi, have illustrated the multifaceted challenges posed by urban flooding. In the Mavoko region and the broader Nairobi Metropolis, each rainy season witnesses rain-fed flooding, a phenomenon common to urban areas globally. Even moderate storms result in increased runoff and higher flood occurrences, aligning with global trends. In response to these challenges, governments worldwide, including Kenya, have implemented strategies to address environmental degradation and enhance emergency response and humanitarian support during urban and peri-urban flooding incidents. Various legal, institutional, and policy frameworks guide the management and coordination of emergency and humanitarian support. These efforts include strategic stockpiling of essential supplies by NGOs and private agencies. However, despite government initiatives promoting community participation and supporting local, community-driven disaster response efforts, individual household participation in humanitarian assistance for disaster victims in peri-urban settlements remains relatively low. This study explores the relationship between homeowners' environmental attitudes and their level of involvement in providing humanitarian support during flooding in the Mavoko peri-urban settlements of Nairobi Metropolis, Kenya.

Keywords: Urban flooding, Humanitarian support, Environmental attitudes, Peri-urban settlements, Community participation

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INTRODUCTION

As the cities and towns grow in sizes, urban flood incidents are reported to get more frequent, complex and multifaceted as illustrated by the recent events in America, Australia, Brazil, Pakistan, Scotland, Sri Lanka and the United Kingdom (Jha et al.,2012; Coates, 2010). African cities like Accra in Ghana, Kano in Nigeria, Kampala in Uganda; Maputo in Mozambique; Bujumbura in Burundi and Nairobi in Kenya have also witnesses serious flooding (Tucci, 2007; ILGS & IWMI, 2012). Each rainy season (March - June and October - December), Mavoko and the larger Nairobi Metropolis experiences rain-fed flooding, when, like in other urban areas worldwide, even moderate storms cause increased runoff and higher flooding incidents (Amnesty International, 2009; Werritty et al., 2007). In line with the HFA, national and local governments globally have implemented a range of strategies to tackle the challenge of environmental abuse; and to enhance emergency response and humanitarian support during flooding in urban and peri-urban settlements (Oluyinka & Balogun, 2011). Most governments, including Kenya, have a legal, institutional and policy framework to guide the management and coordination emergency and humanitarian support such as strategic stockpiling of food, health and essential supplies by social actors such as NGOs and private agecies(UNISDR, 2005). However, although the government appreciates community participation; and have encouraged and supported local community driven initiatives towards disaster response, paticipaticipation by individual households in humanitarian assistance to the disaster victims in peri-urban settlements is reported to be low. It is with this background that this study sought to examine the relationship between the homeowners' environmental attitude and the level of humanitarian support during flooding in the Mavoko peri-urban settlements of Nairobi metropolis in Kenya.

LITERATURE REVIEW

In the last decade, the number of flood events recorded in African cities and towns is higher than the rest of the world disrupting infrastructure like clean water supply, sanitation facilities, electricity, education and health care are disrupted; as well as uprooting people from their homes (Dawson et al., 2008; Werritty et al., 2007). Even cities and towns in the Sahel region of central Africa, usually associated with desertification, have also had flooding with major flood events occurring in Mali (2002, 2003, 2007), Niger (2003, 2007, 2008), Chad (2001, 2007, 2008), and Sudan (2003, 2006, 2007) (Chukwuocha & Ngozi; 2013). In Northern Africa, over 8,800 lives were lost between 1927 and 1995 due to flooding in urban environments of Algeria, Tunisia, Egypt and Morocco (Jha et al., 2011). They also report that urban flooding in Southern Africa caused 1,148 deaths, rendered 500,000 people homeless and jobless, and destroyed 150,250 homes and many assets estimated at US$ 715 million in Mozambique, Zimbabwe, South Africa, Zambia and Namibia between 2000 and 2009. The worst urban flood events on the continent were recorded in Western Africa where in 1982, 1991, 1995, 1998, and 1999 flooding affected more than 500,000 people in each case (Amoako, 2012). In 2010 alone, GFDRR (2011) reported that over 1.7m people were affected by flooding with Benin having 680, 000 people affected, Burkina Faso (133,000 people), Ghana (141,000 people), Nigeria (300,000 people) and Togo (200,000 people affected). Between 2002 and 2006, floods killed over 210 people and rendered thousands homeless in Eastern Africa, with the most affected countries being Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda (Douglas et al., 2008; UN Habitat, 2006).

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The cities and towns in Sahel region of central Africa, usually associated with desertification, has also had flooding with major flood events occurring in Mali (2002, 2003, 2007), Niger (2003, 2007, 2008), Chad (2001, 2007, 2008), and Sudan (2003, 2006, 2007) (Chukwuocha & Ngozi; 2013). In the wake of the flood disruptions, national governments first declare a state of emergency in the inundated regions to set-off the emergency management and humanitarian assistance for the victims (Jha et al.,2012). At the international level, response by organisations like the International Committee of Red Cross and Red Crescent (ICRC), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the United Nations Disaster Assessment and Coordination (UNDAC) and the World Vision within an international legal and policy framework. It is within the international framework that the ICRC, OCHA and UNDAC deployed support for emergency operations in Scotland, Pakistan, Brazil, Sri Lanka and Australia following the recent flood events (IFRC, 2013). In Africa, the ICRC and World Vision have been noted to deploy teams to support humanitarian activities in Ghana, Mozambique, Uganda and Kenya through their the Regional Offices as was seen in Accra after the 2007 flooding (Karley, 2009; OCHA, 2008).

At the national level, most African governments have special ministries and/ or departments responsible for disaster preparedness and response, with the mandate of saving lives and livelihoods in the wake of disaster (Action Aid, 2006). Because floods and disasters in general pose a threat to governance, each country has a legal, institutional and policy framework to guide the emergency response and humanitarian support operations within the country with regard issues such as strategic stockpiling of food and other essential supplies (UNISDR, 2005). In kenya, the legal framework is available in the various legislations like: The Water Act (Cap 372); The Public Health Act (Cap 242); The Medical Practitioners and Dentists Board (Cap 253); The Food, Drugs and Chemical Substances Act (Cap 254); The National Cereals and Produce Board Act (Cap 388) and The Preservation of Public Security Act (Cap 57) amongst others. In spite of the legal framework, response to the increasingly disruptive and multifaceted incidents of urban and peri-urban flooding does not seem to have any special treatment in the National Disaster Management Policy as they take time to attract response from the concerned authorities (IFRC, 2010). Action Aid (2006) and Douglas et al (2008) reported that response to flooding in urban and peri-urban settlements has mainly been individual or household-based in a variety of ad hoc unsustainable ways such as: creating high places in their homes using blocks, furniture, stones on which they put valuable items; and temporarily vacating their residence to join family and friends in other safer locations within the affected cities and/or constructing temporary shelters. Victims have also had to move to central and/or public places such as churches, mosques, chief's palace and other such locations deemed safe; and to construction of barriers to prevent ingress of flood water into their houses.

It is now realised that solutions to the increasing challenges of peri-urban flooding have to be derived from within these environment as the government and other actors start incorporating home-grown coping mechanisms for the residents (Mutugi & Maingi, 2010). However, there is a disconnect between legislation and policy in government and other humanitarian agencies on the one side; and knowledge, attitude and practice at community level on the other (Oluyinka

& Balogun, 2011). This disconnect may require psycho-social intervention because one's participation in community initiatives is determined by one's mind-set about factors in their everyday lives. Different scholars

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have conducted studies to explore citizens' living environment in relation with other variables such as demographic factors, experience and personal values (Houston, et al., 2011). Kruger & Landman (2008) reported that people with low income were more united in fighting petty crime in the settlements. Flamm (2006) reported that younger people would more readily pool together vehicle use than older ones, which is essential in overcoming trinsport crises. These studies present psycho-social complexities and dynamics that formed a basis for this study to explore the effect of homeowners' mindset on their participation in disaster response in Kenya, where positive environmental attitude could be correlated with enhanced humanitarian support amongst neighbours.

The study was guided by Smith's concept of environmental hazards based on which urban flood hazards and the resident community's response there to can be seen as a hybrid product of an interaction between the physical, social and technological factors (Alam et al., 2007). This relationship is considered as interplay between three types of environments, namely: the anthropogenic, the social and the flood risk environments as illustrated in Figure 1.

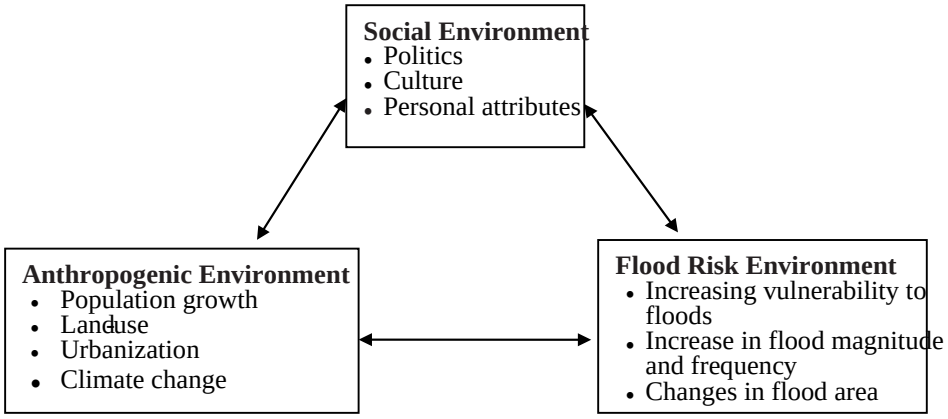

Figure 1: Interplay between human activities in the natural environment and the dynamics in the flood risk environment (Source: Bosher et al., 2009)

From the illustration, it is notable that the anthropogenic factors (in the anthropogenic environment) like population growth and urbanization influence the dynamics in the flood risk environment. In the social environment, social factors like political power, cultural and personal attribute determine the distribution of vulnerability and risk as well as the community's contribution in response thereto. Therefore, this study considered that personal attributes such as attitude (in the social environment) had an influence on some activities in the anthropogenic environment that would determine the dynamics in the flood environment (change in flood characteristics and response there to) as conceptualised in Figure 2.

Independent variables **Intervening variables** **Dependent variables**

 Environmental Attitudeconstruction perimeter walls; Flood hazard **Outcome of flood Interventions**

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- construction of houses in Legal framework Level of humanitarian valleys; Leadership support for flood exchange of information with victims.
  neighbours; Enhanced emergency
- each others' welfare; response to flooding
- estate meetings with neighbours;
- social activities in neighbourhoods

Figure 2: Conceptual model for the correlation between independent and dependent variables (Source: Researcher, 2015)

The effect of the personal attributes on the activities in the anthropogenic environment would influence people's participation in emergency response, and the measures to be used to enhance flood disaster interventions in a given environment. It is anticipated that positive personal attributes (in the social environment) would lead to sustainable activities (in the anthropogenic environment) resulting into active participation in emergency operations by individuals.

METHODOLOGY

Study Site

The research was carried out in the geographical region defined as Mavoko settlement, which covers Mavoko constituency of Machakos County within Nairobi Metropolis. Mavoko settlement was identified for this study because it was considered as forming a special geographical space for academic and practical scrutiny for five reasons. First, the area is a transitional zone between the truly urban Nairobi city and a clearly rural area of Machakos County, hence experiencing rapid socio-economic transformation and environmental challenges related to the emergence of urban activities in rural areas (UN-HABITAT, 2006). Secondly, the study site poses new institutional challenges for socio-ecological planning and vulnerability assessment arising from the intertwined nature of the rural/urban characteristics; the residents' heavy dependence on and exploitation of the natural resources; and the residents' relationships to environmental changes (Eakin et al, 2010).

The third reason was that Mavoko settlement is an integral element of urban systems in spatial, temporal social, economic, functional and planning dimensions, because it and its environment are integral to the growth and operation of the growing Nairobi city (Simon, 2008). Fourth, being at the formative stages of development, the area is a place with the potential for positive change due to the livelihood diversification plus access to services and information that could shape the residents' environmental adaptation (Ricci, 2011). Lastly, the study site is reported to suffer disasters perennially. The area recently suffered mass demolitions of homesteads constructed on illegally acquired land with massive displacement of families; and there occurs flooding every rainy season. The increase in impervious surfaces in the larger Nairobi metropolis will affect local hydrological systems because the area is low lying with a relatively flat surface of poorly draining black cotton soils, exacerbating the residents' vulnerability, thus necessitating better mitigation measures.

Study Population and Sampling

The study targeted heads of household; the general public; community and religious leaders; local government officials; leaders of quasi-government institutions, NGOs, CBOs , NEMA; and officials of the Association of

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architects and physical planners considered to be stakeholders in disaster management in Nairobi. It used the survey design to generate data for the purposes describing the demographic characteristics of the household heads in Mavoko; and to analyse the relationship between homeowners' environmental attitude and the onset of flooding. It was not easy to determine the exact population size of Mavoko at the time of this study because of the fast growing population. Hence, to determine the number of participant household heads, the study employed John Eng (2003)'s formula for calculating representative multistage random sample size of unknown population size as follows.

$$n = \frac{4z^2_{\alpha/2}p(1-p)}{d^2}$$

Where:

n = the sample size

z = the standard normal deviate relating to the 95% degree of confidence set at 1.96

p = an estimate of the proportion of people falling into the group in which we are interested in the population

d = the proportion of error we are prepared to accept

In this study p = 0.5. (Choosing 50% provided the most conservative estimate of the random sample size). The confidence interval of 95% was estimated to be within 10% of the true value. The multistage random sample size was then given by:

$$n = \frac{4 * 1.96^2 * 0.5(1-0.5)}{0.1^2}$$

$$n = 384.16$$

$$n \cong 385$$

This formula gives a number that is an estimate of the absolute minimum, making it necessary to have more respondents to compensate for loss during follow-up or other causes of attrition. John Eng (2003) and Botsch (2011) recommends an addition of 10% of sample size to compensate for persons that the researcher is unable to contact; and further 30% to compensate for non-response. Thus, the sample size for this study was 600 distributed across all county wards in proportion to their population density as illustrated in Table 1.

Table 1: Sample size distribution in Mavoko, Nairobi, Kenya

County Ward	Pop. Density (No. of people/Km^2)	No. of respondents per sub-location		Totals
Athi River	659	Athi River North	101	202
		Athi River Township	101	
Kinanie	43	Kinanie	7	14
		Muthatani	7	
Muthwani	90	Muthwani	10	30
		Katani	10	
		Ngelani	10	

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Syokimau/ Mulolongo	1130	Syokimau	177	354
		Mulolongo	177	
TOTAL				**600**

The sampling of the households who participated in this study was done using the multistage random sampling methods in three stages. First, the study used the lottery technique where the settlements were divided into nine (9) administrative sub-locations in the four county wards as shown in Table 1. In the second phase of sampling, the lottery technique was used to sub-divide the sub-location into small clusters. The urbane sub-locations of Athi River North and Athi River Township in Athi River ward; and Syokimau and Mulolongo in Syokimau/ Mulolongo ward with high population density were clustered into courts. The rural-like sub-locations of Kinanie and Mathatani of Kinanie ward; and Muthwani, Katani and Ngalani of Muthwani ward were clustered based on villages. A list of all the clusters (courts and villages) was drawn with the help of the local leaders. The names and/or identification numbers of all the clusters were written on pieces of paper; and the desired clusters were randomly selected by picking the required number of papers. From the area, the study identified 34 courts each from Athi River North and Athi River Township Sub-locations; 54 courts each from Syokimau and Mulolongo sub-locations; and three villages each from the five sub-locations in Kinanie and Muthwani county wards. The lottery technique was then used to select three (3) households chosen from each of the identified courts and villages. In order to take a random sample, a sample frame in the form of lists of all the household heads in each of the courts and/or villages were drawn with the help of local leaders who acted like gate-keepers. The names and/or identification numbers of all household heads were written on pieces of papers; whereupon the desired sample was selected by picking the required number of papers. This approach was guided by Broer and Titherdge (2010), who used the sampling strategy to reach the dispersed eco-selfbuilt community projects in the UK to evaluate whether Eco-Self-Built Communities lead to feasible, sustainable and low carbon lifestyles. Similarly, in her study, 'public understanding of and response to climate change in the South of England', Whitmarsh (2005) used this strategy to cover different socio-economic groups within flood-prone and non-flood-prone areas; and different groups within areas with differing levels of exposure to air pollution. The sample sizes and sampling techniques of other units of measurement and observation in the study population were as shown in Table 2.

Table 2: Study population units, sampling method and sample size in Mavoko, Nairobi, Kenya

Study population unit	Sampling method	Size (N)
Household in Mavoko	Multistage random, Cluster, Lottery	600
Flood victims in Mavoko	Snowball	20
General Public in Mavoko	Lottery	8
Ministry of lands officials	Purposive	1
Mavoko Sub-County officials	Purposive	1
Red Cross Officials in Mavoko	Purposive	1
NEMA officials	Purposive	1
Residents Association officials	Purposive	2
Religious leaders	Purposive	2

Professional body of physical planners	Purposive	2
Meteorological department	Saturated	2
Focus Group Discussion	Quota	10 per FGD
Document analysis	Saturated	10
Observation checklist	Saturated	10

This study used non-probability sampling methods to identify interviewees and participants in the FGDs. Purposive sampling was used to select officers of government who head disaster response units as well as managers of quasi-government institutions, non-governmental organizations and community leaders that were to participate in the study. This was guided by the work of Dauglas et al. (2008) who used this method and reported that while the urban poor in Africa adapt to floods, recognition of local, national and international governments' and organisations' responsibility to mitigate flooding was urgently needed. I addition, the study used the saturated sampling method to identify and classify literature to be reviewed based on the themes in the study. Pharaoh (2013) also used this sampling method and reported the existence of an analytical gap in the literature on flood-risk in poor South African communities where virtually all of the data was qualitative, having been gathered from interviews, focus group discussions or using participatory risk assessment techniques.

Data Collection

The study used a methodology that embraces both quantitative and qualitative approaches to collect primary and secondary data. The secondary data collection and review preceded the collection of primary data. A review of existing documents provided background information about, and more insights into, the phenomenon of flooding in urban and peri-urban areas (Mogalakwe, 2006). The search for and collection of secondary information was conducted through exploring official and non-official resources. Official sources included publications and policy documents of the KNBS, UN-HABITAT, ICFRC, the National Centre for Disaster Prevention and the meteorological department among others. Secondary data from the KNBS were necessary for the purpose of socio-demographic profiling of the study population, to ensure that the sampling was representative of the socio-demographic characteristics because certain types of individuals and households were likely to be more vulnerable to the effect of flooding than others. Secondary data also provided information on the impact of previous flood events and the community's coping mechanisms. In order to do an exhaustive document analysis, the study first identified the types of documents available and relevant to the study area, before securing authority for their access. Guided by the Evaluation Review (2009), the researche compiled the relevant documents with respect to the objectives of the study and talked to the custodians before checking the accuracy of the documents by comparing those that contain similar information. The information from documents reviewed was then summarised, indicating the type of document reviewed, the way to reference each document and information relating to specific objectives of the study.

Primary data were collected through questionnaire, key informant interviews, focus group discussions and direct observations. The questionnaires were designed to be completed by respondents with minimal or no assistance from the researcher. The respondents were left with the questionnaires to fill for collection after three to seven days. The survey was conducted during the November – December 2012 short rainy season and during the April – May 2013 long rain season. During the November – December 2012 short rainy season, questionnaires as

indicated in Appendix 5 were hand delivered to 120 households in the four County Wards of Athi River, Syokimau/ Mlolongo, Muthwani and Kinania that make up the Mavoko; of which 106 were returned. During the April – May 2013 long rainy season questionnaires were hand delivered to 480 households in the same study area and 417 were returned. A total of 463 (77.16%) of the questionnaires were returned, which upon scrutinising, 55 questionnaires were discarded because the respondents had not filled in properly for accurate analyses.

Key informant interview guides were used to elicit information from officers of government and quasi-government institutions; as well as community and religious leaders to answer the 'how' and 'why' questions for the study to explore differences, inconsistencies and meanings through conversations (Durand, 2009). The interviews provided expert and community opinions about vulnerability of peri-urban settlement communities to flood disasters and the causality factors; effects of flooding on the population; and the mitigation measures. It also gave an in-depth understanding of the intervention measures to enhance the community's response to flooding as informed by professional discourses. Appointment letters and interview guides for face-to-face interviews were hand-delivered to twenty (20) key informants in Mavoko. The proceedings were audio-recorded and written responses from the interviewees in form of handouts obtained.

FGDs were used to obtaining in-depth descriptive data on beliefs, perceptions and practices pertaining to the occurrence of, and response to, flooding in Mavoko. The researcher convened two (2) FGD sessions of ten (10) participants composed of two (2) homeowners who participated in the household survey, (two) 2 representative from the church, two (2) elders, two (2) business people, one (1) youth and one (1) woman from within Mavoko in order to explore some of the issues related flooding in the community. One FGD focused on the urbane area of Athi River Syokimau/ Mulolongo County ward, while the other focused on the rurallike areas of Kinanie and Muthwani County wards. The FGD guide enabled participants to give information on how homeowners' environmental attitude contributes to the onset of flooding. The direct observation checklist enabled the researcher to make observations to enrich his understanding of the homeowners' environmental tendencies with respect to the objectives of the study. The observation included noting and recording of events, behaviours and activities related to how community members relate to and care for the environment. It also focused on the extent of flooding and household participation in flood disaster interventions so as to get an in-depth understanding of the local practices.

Data Analysis

The data collected were in both qualitative and quantitative form and were analysed using descriptive statistics, Chi-square, Correlation analysis and Nomothetic evaluation. Qualitative data involved tape recorded and written responses to interviews, proceedings at the FGDs, field notes and summary of document content analysis. After reviewing the works of different qualitative research specialists, the researcher used the nomothetic evaluation method to analyse the data from the FGDs; and transcribed and analysed qualitative data from the other sources using the hierarchical coding procedure as illustrated by Whitmarsh (2005). The responses were ordered and grouped through cross-case analysis before it was transcribed and analysed using the constant comparative method to develop relationships and interrelationships from which themes and patterns about flood disaster interventions (Occhio, 2003). The issue of validity was addressed by asking a number of interviewees to comment on the analysis. Quantitative data were mainly from closed ended questions in the questionnaires. To determine

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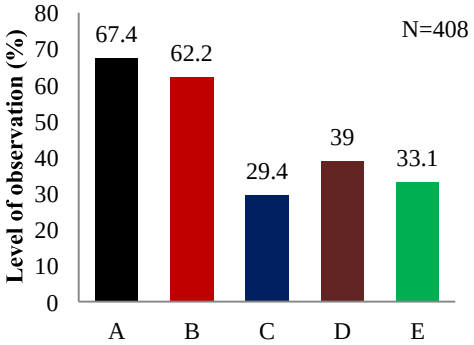
the association between the homeowners' environmental attitude and the onset of flooding, data were collected on the causes and incidences of flooding in the study area through questionnaires. The study used descriptive statistics to measure demographic characteristics before analysing the association through the application of the SPSS. Because the sample size was large (408), the statistically significant Chi-square was not conclusive about the relationship between the variables, hence the need to measure the association between the two variables (Horber, 2013).

Guided by the works of Garson (2012), the current study considered adopting Cramer's V to measure the correlation between the two variables, which were nominal and/or ordinal. This is because: i) It is based on the Chi - square and was easy to generalise across contingency tables of varying sizes; ii) It is not affected by sample size and was therefore very useful in eliminating errors where statistically significant X^2 could have been due to the large sample size instead of any substantive relationship between the variables; and iii) It is interpreted as a measure of the strength of an association between two variables. The coefficient ranges from 0 to 1 Characterised that: (> 0.5) High association; (0.3 to 0.5) Moderate association; (0.1 to 0.3) Low association; and (0 to 0.1) little (if any) association.

RESULTS

a) Households' Attitude towards the Social Environment in Mavoko

In order to examine the attitude of homeowners in Mavoko towards their social environment, the study first sought to find out how much the households tended to engage in a set of practices considered as indicators of their attitude towards the social environment. These practices were: greeting/ making calls to neighbours; participating in estate meetings; visiting neighbours; supporting the needy; and involvement in communal activities. On a scale of "Very Commonly" to "Not Very Commonly", the respondents were asked to indicate how commonly they observed residents engage in each of the activities. The responses obtained were analysed and presented as shown in Figure 3.



Observed practices

KEY

A: Greeting/ Making calls to neighbours

B: Participating in estate meetings

C: Visiting neighbours

D: Supporting the needy

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E: Involvement in communal activities

Figure 3: Observation rate of practices in Mavoko, Nairobi, Kenya

The bar graph showed that 275 (67.4%) of the respondents indicated that they "commonly" observed residents greet and/or make calls to their neighbours, while 254 (62.2%) of them said they "commonly" observed residents participate in estate meetings. The bar graph also shows that 159 (39.0%) of the respondents said they "commonly" observed residents support the needy in their neighbourhoods; 135 (33.1%) "Commonly" observed residents participate in communal activities, while 120 (29.4%) of them indicated that they "commonly" observed their neighbours visiting each other. Multiple data sources revealed that just like in other urban and peri-urban settlements, interpersonal activities among households was limited. Data from direct observation revealed that there was fear and mistrust of strangers in the community; and there were weak interpersonal relationships among the inhabitants. The fear and mistrust is reflected in the stereotypical views that associated urban and peri-urban settlements with crime; and it could be seen in parents' attitudes towards letting children play out unsupervised in more populated areas like Mulolongo and Athi River townships. Data from key informant interviews and proceedings of the FGDs also confirmed that residents of Mavoko seldom interacted with or talked to strangers. In response to the question as to how they would seek help when in trouble, one participant at a FGD at Syokimau said thus:

"…if you have a problem and need help, it is better to rely on the people you know well and trust. …you cannot trust them fully, if you ask them to do something for you, they will certainly give you a hand."

Another one said:

"---people here live individual lives…they do not involve neighbours in their affairs much; and deal with the problems directly affecting themselves…they act in unilateral and self-centred fashion".

Proceedings at the FGDs also revealed that homeowners are increasingly resorting to IT for social interaction, with many of them using mobile telephones, as opposed to physical movement and interaction amongst neighbours. One participant observed thus:

"…mobiles have made communication during emergency quite easy. Recently, my daughter had an attack at night and, thank God, when I called my neighbour, he quickly came and assisted to her to Martyr hospital."

Another one added:

"… with mobiles, I am able to enquire of how my people are doing any time I am away. …also very convenient to get household supplies such as cooking gas …I just call the suppliers."

Data from reviewed secondary literature also revealed that most urban and peri-urban dwellers preferred solitary. For instance, Alvarez-Rivadulla (2007) reported that residents of gated communities in urban and peri-urban settlements preferred keeping to themselves and were not free to interact with strangers they did not understand. However, the researcher observed that this category of people was resorting to interacting on social media. This trend was described as being global and it is credited for the reduction in disaster related fatalities (IFRC, 2013). Through this social platform, the affected communities have enhanced access to the requisite information real time alongside other emergency and humanitarian support in the event of a disaster. The study examined how satisfied the respondents were with the activities in their social environment. On a scale of "strongly satisfied" to "strongly dissatisfied', the respondents were asked to state how satisfied they were with the: exchange of

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information amongst neighbours; concern for each others' welfare in their neighbourhoods; attendance of estate meetings with neighbours; and involvement in social activities in the neighbourhood. The results obtained were analysed and presented as shown in Table 3, which showed that on average, 251 (61.6%) of the respondents were generally "satisfied" with the activities in their social environment. It was observed that 297 (72.9%) of the respondents were 'satisfied' with the level of concern for each others' welfare amongst the residents of Mavoko, followed by 251 (61.6%) of them who indicated they were 'satisfied' with the level of the residents' involvement in social activities in their neighbourhood. The least noted was 264 (64.6%) of the respondents who said they were 'satisfied' with the time the residents spent together with neighbours; and 237 (58.2%) of them who were 'satisfied' with the way information was shared amongst neighboures.

Table 3: Satisfaction with social environment in Mavoko, Kenya

Value statement	**1**	**2**	**3**	**4**	**5**	**T/S (%)**
Exchange of information amongst neighbours	38 (9.3%)	199 (48.8%)	54 (13.2%)	100 (24.5%)	17 (4.2%)	**58.2**
Concern for each others' welfare	95 (23.3%)	202 (49.5%)	38 (9.3%)	50 (12.3%)	22 (5.5%)	**72.9**
Time spent together with neighbours	34 (8.4%)	184 (45.2%)	76 (18.6%)	90 (22.1%)	23 (5.7%)	**53.7**
Involvement in social activities	54 (13.2%)	197 (48.4%)	50 (12.2%)	75 (18.3%)	32 (7.9%)	**61.6**

KEY: 1 = Strongly Satisfied; 2 = Satisfied; 3 = Not sure; 4 = Dissatisfied;
5 = Strongly Dissatisfied; TS = Total Satisfied

The investigated set of practices were indicators of positive attitude towards the social environment. This study revealed that there was a low tendency (46.2%) of the residents to engage in practices that were positive to the social environment; and that 61.6% of the participants were satisfied with their level of engegement in activities positive to the social environment. This revelation showed that the attitude of the households towards the social environment in Mavoko was not very positive. They were highly satisfied with the low participation in activities considered as indicators of positive attitude towards the social environment. Data from secondary literature reviewed revealed that with improved technology, people have isolated themselves from social interaction in the natural environment (Erdogan and Ozsoy (2007). Lemanski (2009), also reported that while one would expect the residents of peri-urban settlement to given that majority of the households own their residences, the original inhabitants of these environments feel dominated and sidelined by the new residents. In addition, reviewed literature revealed that people were resorting to interacting on social media which is also credited for the reduction in disaster related fatalities (IFRC, 2013). Through this social platform, the affected communities have enhanced

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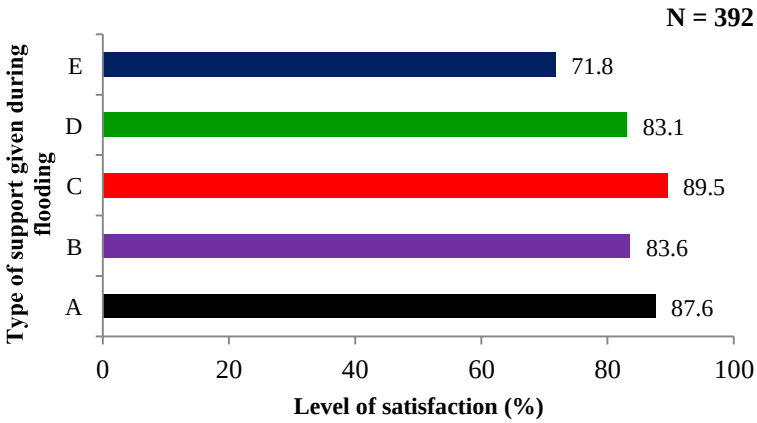
access to the requisite information real time alongside other emergency and humanitarian support in the event of a disaster.

b) Environmental Tendencies and Support during Flooding In Mavoko

The study investigated level of humanitarian support households gave each other at times of flooding for the victims to access: work places and sources of livelihoods; clean drinking water; safe sanitation and toilet facilities; proper health care facilities; and support for children's access to school. On a scale of 'Very Good' to 'Very Poor', the researcher asked respondents to indicate how they rated the support given by their neighbours at times of flooding in Mavoko. Their responses were as shown in Figure 4.



KEY

A: Accessing your place of work
B: Getting clean drinking water
C: Accessing sanitation and toilet facilities
D: Getting proper health care
E: Helping children get to school

Figure 4: Rating of neighbours' support during flooding in Mavoko, Nairobi, Kenya

From the bar graph, it was observed that 134 (34.2%) of the respondents said they were satisfied with their neighbours' support for children get to school. It was also observed that 129 (32.1%) of the respondents were satisfied with the support they got to access proper health care was good, while 118 (30.2%) of them were satisfied with the support they got to access their place of work and livelihood sources. It was further observed that 97 (24.7%) of the respondents approved the support given for them to get clean drinking water for their households, while 61 (15.6%) of them were satisfied with the support they got from their neighbours to access safe sanitation and toilet facilities when theirs burst under flooding. Analyses of secondary documents revealed some of the tendencies towards the social environment that influenced households' participation in community response to flooding as: lethargy to exchange of information with neighbours; lack of concern for each others' welfare; lethargy to estate meetings; and lack of participation in social activities. On a scale of Strongly Agree to Strongly Disagree, the respondents were asked to indicate how much they agreed with statements that each of the negative tendencies impeded their support for each other during flooding in Mavoko.

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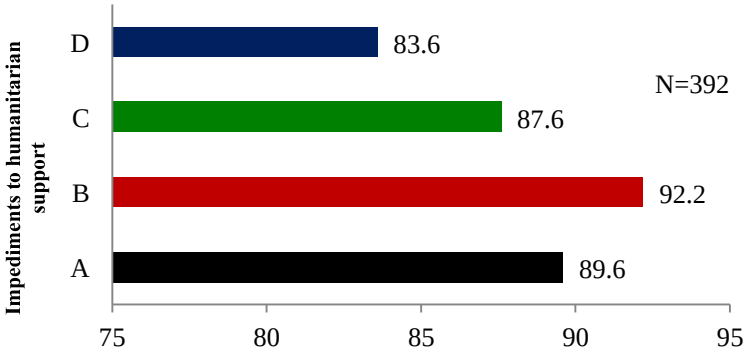
The responses obtained were analysed and the results shown in Figure 5, from which it was observed that 361 (92.2%) of the respondents agreed that lack of concern for each others' welfare was the most serious impediment to their support for each other during flooding. This was followed by 351 (89.6%) of them who agreed that their lethargy towards the exchange of information with neighbours was a major impediment, while 342 (87.6%) of them who agreed that their lethargy towards estate meetings with neighbours deterred them from supporting each other. It was further observed that 328 (83.6%) of the respondents agreed that their lack of participation in social activities by homeowners reduced their support for each other when floods occurred in Mavoko.



KEY

A: Lethargy to exchange of information with neighbours

B: Lack of concern for each others' welfare **C**: Lethargy to estate meetings

D: Lack of participation in social activities

Figure 5: Impediments to homeowners' participation in response to flooding in Mavoko, Nairobi, Kenya

The researcher did a Cramer's V analysis to test the correlation between the homeowners' negative tendencies towards the social environment and the humanitarian support given to the victims of flooding. The results obtained were as shown in Table 4 from which there was observed to be a significant correlation between the homeowners' environmental tendencies and the humanitarian support they give to the victims of flooding in Mavoko.

Table 4: Cross-tabs for Cramer's V values between the various attitude factors and response to flooding by homeowners in Mavoko, Nairobi, Kenya

Homeowners' attitude / **Humanitarian support**	Lethargy towards exchange of information	Lack of concern for each others' welfare	Lethargy towards estate meetings	Lack of participation in social activities

KEY: Table shows Cramer's V values

Original Article

Access to work places and sources of livelihoods	0.335	0.319	0.316	0.245	
Access to clean drinking water	0.548	0.495	0.342	0.409	> 0.5 = High correlation
Access to sanitation and toilet facilities	0.717	1.000	1.000	0.597	
Access to proper health care facilities	0.474	0.254	0.323	0.315	0.3 to 0.5 =
Children's access to school	0.446	0.439	0.319	0.291	Moderate

correlation 0.1 to 0.3 = Low correlation 0 to 0.1 = Little (if any) correlation (Garson, 2012)

DISCUSSIONS

a) Environmental Attitude and Support for Victims access Work-places and sources of livelihood

The study revealed that there was a significant correlation between the respondents' environmental attitude and the support given for the victims to access work places and sources of livelihood in Mavoko during flooding. **The value (Cramer's V = 0.335) revealed that there was a** moderate correlation **between the respondents' l**ethargy towards exchange of information and the support given for the victims to access their work places and sources of livelihoods. **The value** (Cramer's V = 0.319) **also revealed that there was a** moderate correlation **between the respondents' l**ack of concern for each others' welfare and the support given for the victims to access their work places and sources of livelihoods; while a value (Cramer's V = 0.316) **revealed that there was a** moderate correlation **between the respondents' l**ethargy towards estate meetings and the support given for the victims to access their work places and sources of livelihoods. In addition, the value (Cramer's V = 0.245) revealed that there was a low correlation between the homeowners' lack of participation in social activities and the support given for the victims to access their work places and sources of livelihoods. The investigated tendencies were indicators of negative attitude towards the social environment. Thus, the negative Spearman's correlation values observed meant that there was an inverse relationship between the respondents' negative attitude towards the environment and the support given for the victims to access their work places and sources of livelihoods. Thus, the analysis revealed that as the respondents' negative tendencies towards the environment increased, the support given for the victims of flooding to access their work places and sources of livelihoods reduced.

Multiple data sources revealed that people's environmental attitude indeed influenced the support given for victims of flooding to access their workplaces and sources of livelihoods. Data from direct observation revealed that while commercial transporters would readily give lifts to pedestrians wading through flood waters especially just after the rains, as it normally occurred, private car owners would simply drive off even when they were alone in the car.

Data from key informant interviews and proceedings at the FGDs revealed that majority of the homeowners had problems getting out of their houses when flooding occurred; and went to work late or failed to go to work. Some businesses such as motor bicycle operators and construction sites failed to open when the area flooded, which meant that workers went without alternative sources of livelihoods without the support of neighbours as expressed by one participant at a FGD in Syokimau:

"...some neighbours just pass you as you struggle on the road. One day I walked for over three kilometres when my neighbour passed me on the way ... I excused him because he had not known me yet I knew him. Neighbours need to know each other... especially through meetings."

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Similar views were also expressed by another participant at Katani who said:

"...some time, while from work, we walked over 10 km from Mombasa Road to Katani in floods...you cannot tell which part of the road has dangerous portholes ... neighbours with cars just passed us without a thought of giving us a lift. The seasonal stream I cross to my house was completely flooded; I could not even reach my house and had to spend the night at a friend's house."

Data from reviewed secondary documents also revealed that when flooding occurs, residents of peri-urban settlements rely on public good will to access their work and livelihood sources. For instance, whenever it rains heavily in Accra, just like it happens in Nairobi, economic activities come to a standstill as businesses are halted and roads are rendered impassable in most cases and people have to seek transport on heavy tracks (Karley, 2009). Similarly, ILGS and IWMI (2012) reported that when flooding occurs, most work stations and shops do not open; workers are unable to go to work thereby losing livelihoods.

a) Environmental Attitude and Support for Victims to access Clean Drinking Water

The study revealed that there was a significant correlation between the respondents' environmental attitude and the support given for the victims to access clean drinking water in Mavoko during flooding. **The value** (Cramer's V = 0.548) revealed that there was a strong correlation **between the respondents' l**ethargy towards exchange of information and the support given for victims to access clean drinking water. A value (Cramer's V = 0.495) **revealed that there was a moderate correlation between the respondents' l**ack of concern for each others' welfare and the support given for victims to access clean drinking water. Similarly, a value (Cramer's V = 0.342) **revealed** a moderate correlation **between the respondents'** lethargy towards estate meetings and the support given for victims to access clean drinking water; and a value (Cramer's V = 0.409) **revealed a** moderate correlation **between the respondents'** lack of participation in social activities and the support given for victims to access clean drinking water. The investigated tendencies were indicators of negative attitude towards the social environment. Thus, the negative Spearman's correlation values observed meant that there was an inverse relationship between the respondents' negative attitude towards the environment and the support given for the victims to access clean drinking water. Thus, the analysis revealed that as the respondents' negative tendencies towards the environment increased, the support given for the victims of flooding to access clean drinking water reduced. Multiple data sources confirmed that negative environmental attitude, through indicators such as lack of concern for other peoples' welfare and careless disposal of waste water has impeded the support for the victims of flooding to access safe drinking water. Data from direct observation and proceedings at FGDs revealed that during flooding, underground water sources and reservoirs get contaminated leaving the over 70% of the household who relied on borehole and river/ stream without safe drinking water. The study observed that during flooding, pit latrines and septic tanks burst letting the dirt to contaminate the boreholes and wells, which leaves the residents to rely on water from vendors whose safety is not guaranteed. This observation was supported by one participant at the FGD in Syokimau who lamented that:

"...a borehole owner in my area knew very well that it had been contaminated by floods, but he kept supplying us with the dirty water. We visited his place, but we could not access the borehole because the ground was spawn with sewage contents. We had to involve the police and public health officials."

Original Article

Data from reviewed secondary documents also revealed that when flooding occurs, water sources for peri-urban settlement dwellers are heavily contaminated and the victims have to rely on public good will to get clean water. Ashiembi (2013) identified these sources as borehole, shallow wells, vendors, municipal water supply, rivers and rain water harvesting. When these sources get contaminated, peri-urban residents who rely on such sources are thus forced to use water whose contamination levels are higher than the WHO limits (Douglas, 2006; Thompson et al., 2001). As reported by UN-HABITAT (2010), revealed that water vendors make illegal connections and charge much more than the tariff paid by those who are directly connected to the water supply. This price is driven even higher when the water sources are contaminated. These are ethical issues which reflect the relationship between environmental attitude and the support given for the victims to access clean drinking water when flooding occurred in Mavoko.

b) Environmental Attitude and Support for Victims to Access Safe Sanitation and Toilet Facilities

The study revealed that there was a significant correlation between the respondents' environmental attitude and the support given for the victims to access safe sanitation and toilet facilities in Mavoko during flooding. **The value** (Cramer's V = 1.000) **revealed that there was a near perfect** correlation **between the respondents' l**ack of concern for each others' welfare and the support given for victims to access safe sanitation and toilet facilities; and **between the respondents'** lethargy towards estate meetings and the support given for victims to access safe sanitation and toilet facilities. The value (Cramer's V = 0.717) revealed a high correlation **between the respondents'** lethargy towards exchange of information and the support given for victims to access safe sanitation and toilet facilities. A value (Cramer's V =
0.597) **revealed** another high correlation **between the respondents'** lack of participation in social activities and the support given for victims to access safe sanitation and toilet facilities. The investigated tendencies were indicators of negative attitude towards the social environment. Thus, the negative Spearman's correlation values observed meant that there was an inverse relationship between the respondents' negative attitude towards the environment and the support given for the victims to access clean drinking water. Thus, the analysis revealed that as the respondents' negative tendencies towards the environment increased, the support given for the victims of flooding to access clean drinking water reduced. Multiple data sources revealed that most homeowners do not prioritise the issue of constructing pit latrines and septic tanks, which compromises the households' access to safe sanitation and toilet facilities during flooding. Proceedings at the FGDs revealed that priority for most homeowners was to have the main house completed to some habitable level, such that construction of the toilet facilities comes last when the borrowed funds are exhausted hence the use of polythene sheets. When flooding occurs, such toilets burst spewing dirt all over the surface exposing residents to health hazards. When this occurs, residents are forced to share the remaining safe facilities with neighbours. However, some of them were noted to lock up the facilities or gates to keep out neighbours whom they view as intruders coming to fill and soil their toilets. Furthermore, with regard to the cleanliness, privacy and convenience of their own toilet facility (pit latrine), one participant at the FGD observed that it was indeed humbling for one to go begging to be allowed to use a neighbour's facility, especially at night or during other inconveniencing moments like when one has a running stomach.

Original Article

Data from the key informant interviews and proceedings at the FGDs also revealed that residents commonly discharged wastewater into the backyard. This was reportedly common in rental establishments in towns such as Athi River and Mlolongo where many residents used the central wastewater disposal systems, but one which some landlords failed to install. Secondary data from the reviewed literature revealed that about 60% of the water consumed by peri urban residents is for laundry, washing hands, face and hair; and for dish washing UNDP and UNICEF (2004). Unmonitored disposal of the wastewater, consider not foul, compromises the level of hygiene and environmental health as it smells bad and gets filthy on the backstreets (Sigel, 2010). From the foregoing discussion of the psycho-social challenges associated with use sanitation and environmental health, the study revealed that there was a significant relationship between the homeowners' environmental attitude and the support given for the victims to access safe sanitation and toilet facilities.

c) Environmental Attitude and Support for Victims to Access Proper Health Care Facilities

The study revealed that there was generally a significant correlation between the respondents' environmental attitude and the support given for the victims to access proper health care facilities in Mavoko during flooding. **The value** (Cramer's V = 0.474) **revealed that there was a moderate** correlation **between the respondents'** lethargy towards exchange of information and the support given for the victims to access proper health care facilities. The value (Cramer's V = 0.323) also revealed that there was a moderate correlation **between the respondents'** lethargy towards estate meetings and the support given for the victims to access proper health care facilities. The value (Cramer's V = 0.315) **revealed that there was a** moderate correlation **between the respondents'** lack of participation in social activities meetings and the support given for the victims to access proper health care facilities. However, a value (Cramer's V = 0.254) revealed that there was a low correlation **between the respondents'** lack of concern for each others' welfare and the support given for the victims to access proper health care facilities. The investigated tendencies were indicators of negative attitude towards the social environment. Thus, the negative Spearman's correlation values observed meant that there was an inverse relationship between the respondents' negative attitude towards the environment and the support given for the victims to access proper health care facilities. Thus, the analysis revealed that as the respondents' negative tendencies towards the environment increased, the support given for the victims of flooding to access proper health care facilities reduced.

Multiple data sources revealed that attitude towards the environment influenced the health of the households and the support given for the victims to access proper health care during flooding. Data from direct observation revealed that in order to evade rent payment and save money for construction of their own houses, families occupied incomplete or partially complete houses. Others were noted to occupy site structures that seldom provided inadequate protection against the adverse weather conditions, especially when flooding occurred, making the occupants highly susceptible to weather related ailments like colds, coughs and pneumonia. Data from key informant interviews and proceedings of the FGDs also revealed that most homeowners happen to overspend on the purchase of plots and construction of their houses leaving themselves with less money to spend on health care, especially during emergencies. This is because the costs of ownership are more expensive than the cost of renting, at least in the early years, yet the homeowner is driven to ensure he occupies his house regardless of the eventual cost, including medical care.

Original Article

Data from the reviewed literature also revealed a relationship between the housing conditions and the household health and access to health care. Better housing for families have been reported to result in improved health where the interior conditions are directly linked to the genesis of health problems such as dampness and toxic substances (Macintyre et al., 2003). Thus, negative environmental attitude, where the homeowners locate their houses in marshy and swampy areas susceptible to dampness and toxin formation, compromises the health of the entire household during flooding. Similarly, health outcomes may be negative for families who rent and are not keen on keeping the house in good hygienic conditions leading to undesirable neighborhood conditions (Smith et al., 2003). Therefore, it can be concluded that the health of the household is dependent upon the quality of housing and the neighborhood conditions. This finding confirms that there is a significant relationship between the homeowners' environmental attitude and the support given for the victims to access proper health care.

d) Environmental Attitude and Support for Children to Access School

The study revealed that there was generally a significant correlation between the respondents' environmental attitude and the support given for the children to access school in Mavoko during flooding. **The value** (Cramer's V = 0.446) **revealed that there was a moderate** correlation **between the respondents'** lethargy towards exchange of information and the support given for the children to access school. The value (Cramer's V = 0.439) also revealed that there was a moderate correlation **between the respondents'** lack of concern for each others' welfare and the support given for the children to access school. The value (Cramer's V = 0.319) **revealed** another moderate correlation **between the respondents'** lethargy towards estate meetings and the support given for the children to access school. However, the (Cramer's V = 0.291) revealed a low correlation **between the respondents'** lack of participation in social activities and the support given for the children to access school. The investigated tendencies were indicators of negative attitude towards the social environment. Thus, the negative Spearman's correlation values observed meant that there was an inverse relationship between the respondents' negative attitude towards the environment and the support given for the children to access school. Therefore, the analysis revealed that as the respondents' negative tendencies towards the environment increased, the support given for the children to access school reduced. Multiple data sources revealed that of negative attitude towards the social environment affected the support given for the children to access school when flooding occurred. Data from key informant interviews and proceedings at FGDs revealed that because of the under-developed infrastructure in the Mavoko peri-urban settlement, some children access school by crossing through dry river beds or over makeshift bridges made of tree plunks. When flooding occurs, the valleys become inaccessible and the makeshift bridges are washed away affecting mainly children from public schools whose parents without adequate means keep them in indoors out of safety concerns as their mates in the neighbourhood who go to private schools are picked and dropped by school buses. For example, in May 2011, the Athi River flooded for three days preventing some children from going to school. Data from the reviewed literature also revealed that during flooding, the makeshift bridges on huge gutters are removed and carried away by the flood water making it impossible for children to access school on their own as they feared drowning (ILGS & IWMI, 2012). It sometimes took two days or about a week for children to return to school, a reality that affects the learning process of the children because of the infrequent attendance of school leading to poor performance in their national examinations. In addition, there is delayed payment of school fees where parents are not able to access work or sources of livelihoods making, thus children miss school until their parents are able to pay up.

Original Article

CONCLUSSION

This study sought to determine the relationship between the homeowners' environmental attitude and their response to flooding in Mavoko. Analyses of the data revealed that there was a significant inverse relationship between the respondents' negative tendencies towards the environment and the level of humanitarian support they gave to the victims of flooding where, as these tendencies increased, humanitarian support by neighbours to the victims of flooding reduced. The study concluded that there is a significant relationship between the homeowners' environmental attitude and the humanitarian support they gave to the victims of flooding in the Mavoko peri-urban settlement.

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REFERENCES

ActionAid (2006). Climate change, urban flooding and the rights of the urban poor in Africa. Key findings from six African cities

Alam, K., Dankelman, I., Bashar, A. W., Diagne, G. Y., Fatema, N., and Mensah-Kutin, R. (2008). Gender, climate change and human security lessons from Bangladesh, Ghana and Senegal: WEDO, ABANTU for Development in Ghana, Action Aid Bangladesh and ENDA in Senegal.

Alvarez-Rivadulla, M. J. (2007). Golden ghettos: gated communities and class residential segregation in Montevideo, Uruguay. Environment and Planning A 2007, volume 39,

47 – 63. Retrieved from: http://www.urosario.edu.co/urosario_files/4e/4e44c3e2 7f96-42ef-b73c-32134b921b99.pdf

Amnesty International (2009). Kenya - the unseen majority: Nairobi's two million slumdwellers. Retrieved from: http://www.amnesty.org/en/library/asset/ AFR32/005/2009/en/3b6e7351-8e08-4b61-9d7b6e3b86eb0057/afr32005 2009eng.pdf

Amoako, C. (2012). Emerging issues in urban flooding in African cities - The Case of Accra, Ghana. 35th AFSAAP Annual Conference Proceedings 2012. Retrieved from: http://afsaap.org.au/assets/AMOAKO.pdf

Original Article

Ashiembi, P. A. (2013). Factors influencing wastewater management and re-use in peri-urban areas in Kenya: a case of Ongata Rongai. MA thesis, University of Nairobi

Banga, M. (2013). Household Knowledge, Attitudes and Practices in Solid Waste Segregation and Recycling: The Case of Urban Kampala. Zambia Social Science Journal, 2(1), Article

4. Retrieved from: http://scholarship.law.cornell.edu/zssj/vol2/iss1/4

Bosher, L., Dainty, A., Carrillo, P., Glass, J. and Price, A. (2009). Attaining improved resilience to floods: a pro-active multi-stakeholder approach. Disaster Prevention and

Management 18(1), 2009, 9-22. Retrieved from: www.emeraldinsight.com/09653562.htm

Botsch, R. E., (2011). Significance and Measures of Association. Retrieved from: http://www.usca.edu/polisci/apls301/Text/Chapter2012.Significanceand Measures of Association.htm

Broer, S. and Titheridge, H. (2010). Eco-self-build housing communities: Are they feasible and

can they lead to sustainable and low carbon lifestyles? Sustainability 2010, 2, 2084-2116. Retrieved from: www.mdpi.com/journal/sustainability

CBS (2003). Population and Housing Census. Counting Our People for Development Vol.1. Central Bureau of Statistics, Nairobi.

Coates, T. (2010). Conscious Community: Belonging, identities and networks in local communities' response to flooding. Ph.D thesis, Middlesex University. Retrieved from: http://eprints.mdx.ac.uk/6592/

Dawson, R. J., Speight, L., Hall, J. W., Djordjevic, S., Savic D. and Leandro, J. (2008). Attribution of flood risk in urban areas. Journal of Hydro-informatics, 10 (4), 275–288. Retrieved from http://www.iwaponline.com/jh/010/jh0100275.htm

Douglas, I., Alam, K., Maghenda, M., Mcdonnell, Y., Mclean, L. and Campbell, J. (2008). Unjust waters: climate change, flooding and the urban poor in Africa. Environment and Urbanization, 2008 (20) 187. Retrieved from: http://eau.sagepub.com/ content/20/1/187.

Durand, F. J. A. (2009). Unpacking the social construction of ´natural´ disaster through policy discourses and institutional responses in Mexico: The case of Chalco Valley's Floods, State of Mexico. Ph.D thesis, The Bartlett University College London. Retrieved from:

http://discovery.ucl.ac.uk/18983/1/18983.pdf

Eakin, H., Lerner, A.; and Murtinho, F. (2010). Adaptive capacity in evolving peri-urban spaces: Responses to flood risk in the Upper Lerma River Valley, Mexico. Global Environmental Change

Ekere, W., Mugisha, J. and Drake, L. (2009). Factors Influencing Waste Separation and Utilization among Households in the Lake Victoria Crescent, Uganda. Waste Management 29, 3047-3051

Erdogan, M. and Ozsoy, A. M. (2007). Graduate students' perspectives on the human-environment

relationship. Journal of Turkish Science Education, 4(2). Retrieved from: http://www.tused.org/internet/tufed/arsiv/v4/i2/ metin/ tusedv4i2s2.pdf

Evaluation Review. (2009). Data collection methods for evaluation: Document review. Evaluation Briefs, 18

Flamm, B. J. (2006). Environmental knowledge, environmental attitudes, and vehicle ownership and use. Ph.D dissertation, University of California, Berkeley.

Frederiks, E. R., Stenner, K. and Hobman, E. V. (2015). The socio-demographic and psychological predictors of residential energy consumption: A comprehensive review. Energies 2015,

8, 573-609. doi:10.3390/en8010573. Review from: www.mdpi.com/journal/energies Garson, G. D. (2012). Measures of Association. Asheboro, NC: Statistical Associates Publishers.

Horber, E. (2013). Nominal association coefficients. Retrieved from:

http://www.unige.ch/ses/sococ/cl/////stat/stat/association.nomcoeff.html

Houston, D., Werritty, A., Bassett, D., Geddes, A., Hoolachan, A and McMillan, M. (2011). Pluvial (rain-related) flooding in urban areas: the invisible hazard. JBA Consulting, University of Dundee and University of St. Andrews. Retrieved from:

http://www.jrf.org.uk/publications/pluvial-flooding-invisible-hazard

IFRC. (2010). World Disasters Report 2010: Focus on urban risk. Retrieved from: http://www.ifrc.org/publicat/wdr2010/images/WDR2010-cover.jpg. .

IFRC. (2013). World Disasters Report 2013- Focus on technology and the future of humanitarian action. Retrieved from

www.ifrc.org/PageFiles/134658/WDR%202013%20complete.pdf

ILGS and IWMI (2012). Community adaptation to flooding risk and vulnerability. Final Report,

Original Article

February, 2012

Jha, A., Lamond, J., Bloch, R., Bhattacharya, N., Lopez, A., Papachristodoulou, N., Bird, A.,

Proverbs, D., Davies, J. and Barker, R. (2011). Five Feet High and Rising: Cities and Flooding in the 21st Century. Policy Research Working Paper 5648. The World Bank, Transport, Energy & Urban Sustainable Development Unit, East Asia and Pacific Region. Retrieved from http://econ.worldbank.org

Jha, A. K., Bloch, R. and Lamond, J. (2012). Cities and Flooding A Guide to Integrated Urban Flood Risk Management for the 21st Century. Washington, DC: World Bank, GFDRR. Retrieved from: http://www.gfdrr.org/gfdrr/sites/gfdrr.org/files/ publication/World_Bank_ Cities_and_Flooding_Guidebook.pdf

John Eng. (2003). Sample size estimation: How many individuals should be studied? In Radiology 227, 309–313. Retrieved from: http://radiology.rsna.org/content/227/2/ 309.full.pdf.

Karley N. K. (2009). Flooding and physical planning in urban areas in West Africa: Situational analysis of Accra, Ghana. In Theoretical and Empirical Researches in Urban Management Number 4(13)

Kruger, T. and Landman, K. (2008). Crime and the physical environment in South Africa: Contextualising international crime prevention experiences. Built Environment, 34(1), 75-87.

Lemanski, C. (2009). Spaces of exclusivity or connection? Linkages between a security village and its poorer neighbour in a Cape Town master plan development. Dark Roast

Occasional Paper Series No. 21. Isandla Institute, Cape Town, SA

Macintyre, S. A., Ellaway, R., Hiscock, A., Kearns, G. D. and Mackay, L. (2003). What Features of the Home and the Area Might Help to Explain Observed Relationships Between Housing Tenure and Health? Evidence from the west of Scotland. Health Place 9: 207218.

Mogalakwe, M. (2006). The use of documentary research methods in social research. African Sociological Review, 10(1), 221-230.

Mutugi, M. W. and Maingi, S. G. (2011). Disasters in Kenya: A major public health concern. Journal of Public Health and Epidemiology, 3(1), 38-42. Retrieved from: http://www.academicjournals.org/jphe

Occhio, C. (2003). Local governance, Collective actions and civic development: A Study case in the last European dictatorship, the Republic of Belarus. In faces of poverty – capabilities, mobilization and institutional transformation. Proceedings of the international CERES summer school (pp 334 – 342). Amsterdam: Tropical Royal

Original Article

Institute.

OCHA (2008). Floods and landslides. Location of Event, Kenya. Accessed on 12th September 2013 at: www.disasterscharter.

Oluyinka, O. and Balogun, S. K. (2011): Psycho-sociocultural Analysis of Attitude towards Littering in a Nigerian Urban City. Ethiopian Journal of Environmental Studies and Management, 4(1)

Pharoah, R. (2013). Sometimes I think the shack was better: Examining Flood-Risk in Subsidised Housing Areas in Cape Town. Ph.D thesis, University of Cape Town.

Ricci, L. (2011). Peri-urban livelihood and adaptive capacity: the case of Dar-es-salaam. In proceedings of the 5th AESOP young academics network meeting, the Netherlands. Retrieved from: http//www.planning4 adaptation.eu/Docs/papers/04 AESOP Paper Ricci.pdf

Sigel, K. (2010). Environmental sanitation in peri-urban ger areas in the city of Darkhan

(Mongolia): A description of current status, practices, and perceptions. UFZBericht, Helmholtz-Zentrum für Umweltforschung, No. 02/2010. Retrieved from: http://hdl.handle.net/10419/57850

Simon, D. (2008). Urban Environments: Issues on the Peri-Urban Fringe. The Annual Review of Environment and Resources. Retrieved from: www.annualreviews.org

Smith, S. J., Donna E., Moira, M. and Katrina, M. T. (2003). Housing as Health Capital: How Health Trajectories and Housing Paths are Linked. Journal of Social Issues, 59(3), 501525.

Smith, M. (2009). Lessons learned in WASH response during urban flood emergencies. The global WASH learning project. Retrieved from: www.humanitarianreform.org/WASH

Teo, M M M, Loosemore, M, Marosszeky, M, Karim, K and Gardner, D. (2000). Operatives' attitudes towards waste on construction project. In: Akintoye, A (Ed.), 16th Annual ARCOM Conference, 6-8 September 2000, Glasgow Caledonian University. Association of Researchers in Construction Management, 2, 509-17

Tucci, C. E. M. (2007). Urban Flood Management. Cap-Net International Network for Capacity Building in Integrated Water Resources Management. Retrieved from: http://www.capnet.org/sites/capn-et.org/files/Urban%20 flooding _E_ Low Res.pdf

UNDP and UNICEF (2004). Access to water and sanitation services in Mongolia, Ulaanbaatar.

UN-HABITAT. (2006). Mavoko urban sector profile. Nairobi: UN-HABITAT. Retrieved from: www.unHABITAT.org/pmss/getElectronicVersion.aspx?nr=2789andalt=1

Original Article

UN-HABITAT. (2010). The State of African Cities 2010: Governance, Inequality and Urban Land

Markets. Nairobi: UN-HABITAT. Retrieved from: http://www.africafiles.org/article.asp

UNISDR (2005). Hyogo Framework for Action 2005–2015: building the resilience of nations and communities to disasters. Retrieved from: www.unisdr.org/ wcdr/intergover/officialdoc/L-docs/Hyogo-framework-for-action-english.pdf.

Victoria, L. P. (2005). Community based approaches to disaster mitigation. In World Conference on Disaster Reduction. Hyogo, Japan: UNISDR. Retrieved from: http://www.adpc.net/v2007/programs/CBDRM/INFORMATIONRESOURCECENTER/CBDRMPublications/2008/final_cbdrmANDpoverty_23nov.pdf.

Werritty, A., Houston, D., Ball, T., Tavendale, A. and Black, A. (2007). Exploring the social impacts of flood risk and flooding in Scotland. Scottish Executive Social Research

Whitmarsh, L. E. (2005). A study of public understanding of and response to climate change in the South of England. Ph.D thesis, University of Bath.