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Level of Awareness on Disaster Risk Preparedness in Informal Settlements of Nyeri Town, Nyeri County, Kenya.

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Abstract

Purpose: The main objective of this study was to assess level of awareness on disaster risk preparedness in informal settlements of Nyeri town, Nyeri County, Kenya. To achieve this, the study was guided by two specific objectives: to establish the level of awareness on the types of disasters that can affect the informal settlement residents in Nyeri town and to determine the level of awareness on the existence of disaster risk reduction policies to curb disasters among the people living in informal settlements of Nyeri town.

Methodology: The study adopted a descriptive research design using primary data collected through a structured questionnaire. The population for this study was 384 respondents of the four settlements of Nyeri town, that is, Majengo Witemere Ngangarithi,mathari and Ruring'u Muslim village.

Results: The study found out that, majority of the respondents 93.0% was aware of the disasters that can affect them in their area of residents. The study further established that, majority of the residents 196 (51.0%) was aware of the existence of disaster risk reduction policies as compared to 49.0% who were not aware of any disaster risk reduction policy. The results also showed that there was a significant association between the level of education of the respondents and the level of awareness of the disaster that could affect them [X^2 (3) = 14.848, p-value =0.002<0.05] and the religions of the respondents and the level of awareness of the disaster that could affect them [X^2 (2) = 7.090, p-value =0.029<0.05]. The results however indicated that, there was no significant

association between the level of awareness of the disaster that could affect the respondents with the area of residents, age of the respondents and their occupation as given by the p-values of 0.393, 0.485 and 0.390 respectively. The study further established that, there was a significant association between the education level of the respondents and the level of awareness of any policy rule concerning with disaster risk reduction [X^2 (3) = 8.056, p-value =0.045<0.05], and the religions of the respondents and the level of awareness of any policy rule concerning with disaster risk reduction [X^2 (2) = 10.031, p-value =0.007<0.05].

Unique Contribution to Theory, Policy and Practice: It was concluded that Risk assessment as a step for successful disaster reduction measures will ensure that the community members are aware of the possible hazards. National and County government should incorporate the national and international policies and guidelines in their policy. The Government should be keen on learning on previous disasters that have affected other informal settlements and other parts of the country by having disaster management well kwon by the communities living in informal sectors. The researcher further recommends to the scholars to consider research on Disaster risk preparedness as the strategy of counties development agenda and Social and economic potentials that the County Governments can tap in informal settlements.

Keywords: *Awareness, Disasters Risks, Policies, Preparedness*

INTRODUCTION

Informal settlements are groups of people living on land they have no legal claim to and construct houses without approved plan resulting in squatter settlements, slum or shanty town (Doveym, 2013). They are found across the globe mainly in developing countries in urban areas. The settlements are growing and an estimated 1 Billion people in the world live in slums. Problems in urban areas are caused by the change in cities over time. This change such as different economic base (service industries instead of manufacturing) or different activities or population movement leads to different needs within the urban areas (Wekesa, Steyn and Otieno, 2011).

Disasters are worldwide phenomena that range from being highly localized to global in scope (Ronan et al., 2015). Regardless of their origin and classification, all disasters have a public health importance due to their potential to cause loss of lives and livelihoods. What differs, however, is the community's preparedness, which determines its ability to cope and prevent loss of lives and livelihoods during the event and immediately after (Levac, Toal-Sullivan and OSullivan, 2012). Disaster preparedness is a continuous and integrated process resulting from a wide range of risk reduction activities and resources rather than from a distinct sectoral activity by itself (Munasinghe and Matsui, 2019). Predicting a disaster before it happens allows mechanisms such as evacuations that drastically reduce loss of lives and properties. Cities and urban areas provide important opportunities for the development of communities and nations (Baker and Grant Ludwig, 2018). Risks caused by rapid and often improper urbanization compounded by natural hazards create some of the major challenges in the 21st Century. Lam et al. (2017) estimate that by 2050, 66 per cent of the world's population will be urban, while rapid and unplanned urbanization will also continue to see a dramatic rise in informal settlements. Aside from the negative impacts of improper urbanization on socioeconomic development, the risks and humanitarian consequences of rapid urbanization are alarmingly increasing (Etinay, Egbu and Murray, 2018).

Rapid urbanization and the increasing complexity in urban contexts require better understanding of risk factors and sources of vulnerability and exploring innovative ways for effective disaster risk reduction and response and cooperation with other stakeholders (Baker and Grant Ludwig, 2018). Public education and awareness are necessary in order for members of local communities to collect and document information of disasters that they have encountered and lessons learnt as prerequisites of preparedness for future disasters (Paton, 2019). It is important, to incorporate homegrown coping mechanisms for each community. These activities are supposed to be devoted to the local authorities and provincial administration units in every community. The repetitive nature of both the natural and man-made disasters in the 25years suggests that despite the legal, institutional and policy framework, local communities are not adequately prepared for disaster prevention, control and mitigation (Levac et al., 2012). It is likely that these programs have not been devolved and adequately implemented at community levels.

Problem statement

A number of factors have driven the emergence of informal settlements. They include rural-urban migration lack of affordable housing, weak governance, economic vulnerability, low paid work marginalization and displacement caused by conflicts, natural disasters and climate change (UN-Habitat, 2015b). According to Doveym, (2013), these settlements continue to be geographically, economically, socially and politically disengaged from wider urban system and excluded from urban opportunities and decision making. Buildings in the informal settlements in Nyeri town are erected without access roads between them posing the dangers of fires where the fire fighters cannot gain access leaving many families at risk of disasters (GOK, 2015). In the year 2015/2016 there were 99 fire incidences in the whole of Nyeri County and 45 (50%) occurred in informal settlements (Nyeri Fire brigade report 2015). This shows that there are more disaster risks in informal settlements than in other areas. During disasters, many families incur losses, and children, including disabled are most affected hence aggravating poverty in informal settlements. There is no community initiative to curb disasters and no studies have been done to scientifically analyze the problems. This study therefore seeks to assess the level of awareness on disaster risk preparedness in informal settlements of Nyeri town, Nyeri County, Kenya.

Objective of the study

The general objective of this study was to assess the level of awareness on disaster risk preparedness in informal settlements of Nyeri town, Nyeri county, Kenya. The specific objectives were:-

- To establish the level of awareness on the types of disasters that can affect the informal settlement residents in Nyeri town
- To determine the level of awareness on the existence of policies to curb disasters among the people living in informal settlements of Nyeri town

Research questions/Hypothesis

What is the level of awareness on the types of disasters affecting informal settlements?

i) What is the level of awareness on the policies related to disaster risk reduction?

LITERATURE REVIEW

Theoretical Review

Theory of Planned Behaviour

The study used the theory of planned behavior to discuss the two objectives which sought to assess the level of awareness on the types of disasters and policies in place to curb disasters among the people living in informal settlements of Nyeri town. The theory of Planned Behaviour is one of the models most frequently used in the literature to explore pro-environmental behaviour including recycling, travel mode choice, energy consumption, water conservation, food choice, and ethical

investment (Stern, 2000; Staats, 2003). Armitage and Conner (2001) identified its application in 154 different contexts. The model of the theory of Planned Behaviour assumes that consumers make decisions by calculating the costs and benefits of different courses of action and choosing the option that maximises their expected net benefits. The theory of Planned Behaviour belongs to the so-called group of 'rational choice models'. It builds on the following key assumptions: Individual self-interest is the appropriate framework for understanding human behaviour; rational behaviour is the result of processes of cognitive deliberation; Internal factors, especially the attitude, play the most important role. The policy interventions that flow from this model are relatively straightforward. Policy should seek to ensure that consumers have access to sufficient information to make informed choices.

Empirical Review

Level of awareness of the disasters that can affect the residents in the informal settlements of Nyeri Town.

According to Qureshi et al. (2006), any disaster management is successful only when the general public has some awareness about the disaster. The key to reducing loss of life, personal injuries, and damage from natural disasters is widespread public awareness and education. People must be made aware of what natural hazards they are likely to face in their communities. They should know in advance what specific preparations to make before an event, what to do during a hurricane, earthquake, flood, fire, or another likely event, and what actions to take in its aftermath. According to Ismaila Rimi Abubakar (2019) In Saudi Arabia, many cities have been recently experiencing incidences of disasters, such as floods, disease epidemics, and sandstorms. However, studies on public perception of disaster risk in the country are few and nascent. Disasters are prevalent worldwide, and there is a need to engage high-risk populations in collaborative disaster management activities to improve resilience that is inclusive of the whole community (Enarson, and Walsh, 2007). It is clear from extant literature that awareness has a supportive influence on collaboration; however, there is a need for a better understanding of how this interaction activates action toward collaborative disaster management activities (Mendoza et al., 2014; Na, Okada, and Fang, 2009), especially for high-risk populations (Enarson, and Walsh, 2007). A study conducted to examine fire safety mechanisms and their effect on prevalence of fire disasters in Kenya slums found that majority of the respondents did not know of any fire safety mechanism while some had poor knowledge about fire safety mechanisms. Majority of the participants pointed to the need to increase awareness on how to mitigate and deal with fire disaster while others appealed to the government to provide safety facilities, Edobot (2015). A study by Murage (2012) assessed factors influencing fire disaster preparedness in the central business district of Nyeri Town, Nyeri County. The study found that the level of fire safety awareness is very low and the Municipal council does not inspect compliance with fire disaster preparedness by laws.

Level of awareness on the existence of policies to related to disaster risk reduction to curb disasters among the people living in informal settlements of Nyeri town

National disaster management policies seek to set the overall policy goal and objectives for disaster risk management, provide a broad policy framework for the harmonization of sectoral and cross-sectoral policy objectives, principles and strategies and establish an integrated and multi sectoral approach to disaster management (Tall, Patt and Fritz, 2013). The policies also seek to promote positive behavioural and attitudinal change towards disaster management, provide a basis for the formulation of a comprehensive disaster management legal framework and establish an institutional framework for disaster preparedness , management and to establish an effective monitoring and evaluation system and provide for an effective information management system to facilitate collection, storage, analysis and dissemination of disaster management information, (Murange, 2012). Over the years, disasters in Kenya have been handled without a coordinated disaster management policy, legal and institutional frameworks (Menya and K'Akumu, 2016). In addition, disaster response activities have been poorly coordinated, due to lack of standard operational procedures and disaster emergency operation plans. This situation remains a challenge that has led to duplication of efforts and wasteful use of resources.

METHODOLOGY

Research design

This study used descriptive cross-sectional study design in which the awareness or condition and potentially related factors were measured at a specific point in time for a defined population according to Flick (2015). This design is preferred because it allows for investigation of more than one variable (Mugenda and Mugenda, 2010).

Research Population and sample

The study targeted residents of the four informal settlements of Nyeri town with a population of 97,469 people. The four settlements were Majengo, Ruringu, Ngangarithi and Mathari in Nyeri town. The population of study was the male and female residents of informal settlements of Nyeri town. It was also decided to include population of different ages, religions, occupation and education. Sample size was calculated using Fisher et al. (1998) formula. The study used a sample size of 384 respondents that was divided proportionally between the four settlements. The study used simple random sampling to identify the respondents. Simple random sampling reduced bias and gave each individual in the informal settlements a chance to participate.

Ethical Considerations

Scientific approval for the study was sought from Graduate Studies Committee. Ethical approval was sought from the Meru University Institutional Research Ethics Review Committee. Permission to collect data was obtained from the Nyeri County Commissioner's office and the Nyeri County Government. Consent to participate in the study was sought from the potential

respondents. The participants were guaranteed that the privacy of the data was protected by strict standard of anonymity.

Research Variables

Awareness of disaster and existence of policies were the independent variables while the dependent variable was disaster risk preparedness.

Data Collection

This research used the primary and secondary data. The instrument used for the collection of the primary data was questionnaire containing questions to measure the level of awareness of the respondents on the type of disasters in their area and existence of policies related to disaster risk reduction. The secondary data constituted relevant literature such as journals, reports internet and related books which contributed to the development of study.

STATISTICAL ANALYSIS

The following statistical were used,

1. Frequencies

2. Chi-square tests

Demographic Data Analysis

The study was interested in the demographic information of the respondents to help understand better the data on the topic under study. This entailed information on respondents' age, gender, occupation, marital status, level of education and religion.

Table 1 Demographic results

Demographic Variables	Frequency	Percentage
Gender		
Male	184	47.9
Female	200	52.1
Total	**384**	**100.0**
Age of Respondents		
20-30	141	36.7
31-40	88	22.9

41-50	75	19.5
51-60	48	12.5
>60	32	8.4
Total	**384**	**100.0**
Type of occupation		
No Employment	146	38.1
Salaried Employment	47	12.2
Self-employment	191	49.7
Total	**384**	**100.0**
Marital Status		
Divorced	22	5.7
Married	184	47.9
Not Ready to answer	28	7.3
Single	126	32.8
Windowed	24	6.3
Total	**384**	**100.0**
Level of Education		
College University	91	23.7
No Education	23	6.0
Primary	97	25.3
Secondary	173	45.0

Total	**384**	**100.0**
Religion		
Christian	263	68.5
Muslim	114	29.7
None	7	1.8
Total	**384**	**100.0**

Table 4.1 shows that, the total number of female respondents was 200(52.1%) and that of men was 184(47.9%). This indicates that, gender inclusion was considered by the researcher. The study indicates that majority of the respondents 229(59.6%) are in their lower middle age and middle age of between 20-40 years. Age determines the level of vulnerability of an individual to respond to disasters. It also influences person's contribution to social networking and communal activities. The findings indicate that, there is significant number of non-employed residents 146(38.1%) in the informal settlement of Nyeri town. Unemployment may drive individuals to indulge in some informal activities that may accelerate the effects of a disaster when it occurs.

The findings show that majority of the respondents 187(47.9%) were married. Marital status may influence the capacity of a household to mitigate a disaster. This result indicate that, majority of the respondents 293(76.3%) were literate (at least reached up to primary level). The level of education is very important to establish extend of awareness of the residents on disaster risk preparedness. The results further shows that majority of the residents in the informal settlements of Nyeri town are Christian as indicated by 263(68.5%). Religions may affect the level of acceptance of some of policies related to disaster risk reduction.

Level of awareness of the respondents on the types of disasters in their area

Respondents were asked whether they are aware of disasters that can affect them and to give the most common one. The result was recorded in table 2.

Table 2 Level of awareness of the respondents on the types of disasters in their area

Are you aware of the disasters that can affect you?	Results	Frequency	Percentage
	Yes	357	93.0
	No	27	7.0

Total		**384**	**100.0**
If yes Which is the commonest disaster in this area among these	**Disaster**	**Frequency**	**Percentage**
	Fires	196	54.9
	Flood	32	9.0
	Landslides	51	14.3
	None of the Above	78	21.8
	Total	**357**	**100.0**

Table 2 shows that, majority of the respondents 357 (93.0%) are aware of the disasters that can affect them in their area of residents. Minority of the respondents 27(7.0%) are not aware of disasters that can affect them in their area of residents. This indicate that majority of them are well informed and conscious of the disasters in their areas. It was further established that, the most common disaster in the areas (Majengo, Ruring'u, Mathari and Ngangarithi) was fire where 196 (54.9%) of the respondents admitted that they were aware of the disasters that could affect them in their area of residents. This was followed by landslides with 51(14.3%) respondents and the last was floods with 32(9.0%) of the respondents. It was further established that, 78(21.8%) of the respondents stated that, none of the three (fire, landslides and floods) is common in their area of residents.

Level of awareness on the existence of disaster risk reduction policies

Respondents were asked whether they are aware of any policy rule concerned with disaster risk reduction and to state the one that they know. The result was recorded in table 3

Table 3 Level of awareness on the existence of disaster risk reduction policies

Are you aware of any policy rule concerned with disaster reduction?	**Results**	**Frequency**	**Percentage**
	Yes	196	51.0
	No	188	49.0
	Total	**384**	**100.0**

	If yes which one?	**Policy**	**Frequency**	**Percentage**
		Environmental	77	39.3
		Housing	73	37.2
		Land	31	15.8
		Water groups	15	7.7
		Total	**196**	**100.0**
Do you comply with the policy rule that you know concerning disaster risk reduction?	**Results**	**Frequency**	**Percentage**	
	Yes	193	50.3	
	No	191	49.7	
	Total	**384**	**100.0**	
	If no, give reasons	**Reason**	**Frequency**	**Percentage**
		Hard to follow	123	64.4
		Is not for poor like me	9	4.7
		It is costly	14	7.3
		other reason	42	22.0
		There is no risk	3	1.6
		Total	**191**	**100.0**
Do you think these regulations/Laws promote positive behavioural and	**Results**	**Frequency**	**Percentage**	

attitudinal change towards disaster management?				
	No		92	24.0
	Yes		292	76.0
	Total		**384**	**100.0**
Are you familiar with bodies that enhance the laws in this area?	Yes		311	81.0
	No		73	19.0
	Total		**384**	**100.0**
	If yes which ones?	**Body**	**Frequency**	**Percentage**
		Community members	87	28.0
		County government	186	59.8
		Individuals	13	4.2
		National government	25	8.0
		Total	**311**	**100.0**
What do you think are consequences of not complying with the regulations? Choose one	**Consequences**	**Frequency**	**Percentage**	
	Arresting people	94	24.5	
	Demolition of houses	63	16.4	
	Eviction	29	7.6	

	Relocation	129	33.6
	Stopping people from settling in those areas	69	18.0
	Total	**384**	**100.0**
How do you think these policies can be improved? Choose one.	**Ways**	**Frequency**	**Percentage**
	Through Bottom-up approach	188	49.0
	Through Combined approach	144	37.5
	Through Top-down approach	52	13.5
	Total	**384**	**100.0**

Table 3 shows that, majority of the respondents 196 (51.0%) are aware of existence of a disaster reduction policy rule. Minority of the respondents 188(49.0%) are not aware of existence of a disaster reduction policy rule. This figure 188(49.0%), is quite significant and it implies that many people living in the informal settlements are not aware of any policy rule concerning with disaster reduction. For those who are aware of existence of any policy rule, they were asked to state the one they know. It was established that, environmental policy was commonly known by the residents with 77(39.3%) respondents followed by housing policy 73(37.2%) respondents, land policy 31(15.8%) and the least was water policy 15(7.7%).

Table 3 indicate that, majority of the residents from informal settlements of Nyeri town comply with the policy rule concerning disaster risk reduction as shown by 193(50.3%) of respondents. 191(49.7%) respondents confirmed that they do not comply with the policy rule concerning disaster risk reduction. This number is quite significant. When they were asked to give reasons for not complying with the policy rules, majority of them said that the rules were hard to follow as indicated by 123(64.4%) of the respondents who failed to comply with the regulations.

Table 3 shows that, majority of the residents in the informal settlements of Nyeri town think that the disaster risk reduction regulations/laws promote positive behavioural and attitudinal change towards disaster management as indicated by 292(76.0%) of the respondents while 92(24.0%) of

the respondent thought that the regulations/laws do not promote any positive behavioural and attitudinal change towards disaster management.

Table 3 indicate that, majority of the residents in the informal settlements of Nyeri town were familiar with the bodies that enhance disaster risk reduction laws as confirmed by 311(81.0%) respondents. Only 73(19.0%) of the respondents were not familiar with the bodies. It was noted that, 186(59.8%) of the respondents who were aware of the bodies confirmed that they were more familiar with the County Government, 87(28.0%) of the respondents were familiar with the Community members, 25(8.0%) were familiar with the National Government and the least was Individual bodies that was confirmed by 13(4.2%) of the responded.

Table 3 show that, the main action taken to an individual who would not comply with the disaster risk reduction regulations was relocation of the individual as confirmed by 129(33.6%) of the total respondents. The other action that could be taken to a non-compliance was arresting of the individuals as confirmed by 94(24.5%) of the respondents. 69(18.0%) of the respondents indicated that, if people failed to comply with the regulations they would be stopped from settling in those areas, 63(16.4%) of the respondents said that the action that were normally taken to non-compliance was demolition of houses. The least action taken was eviction of the individuals who failed to comply with the disaster risk reduction regulations as supported by 29(7.6%) of the respondents.

Table 3 shows that, majority of the residents in the informal settlements of Nyeri town preferred improvement of the disaster risk reduction policies through bottom-up approach as indicated by 188(49.0%) of the respondents followed by through combined approach as indicated by 144(37.5%) of the respondents and the least preferred approach of improving the policies was the top-down approach as indicated by 52(13.5%) of the respondents.

Association between the informal settlement demographic characteristics and the level of awareness of the disasters that can affect the respondents in their area of residents

Association of informal settlement demographic characteristics with awareness of the disasters that could affect the respondents in their area of residence was calculated using chi-square and results recoded in table 4 The results showed that the level of awareness was higher in those reside in Mathari 90(95.7%) informal settlement compared to the others. However, the results indicated that there was no significant association between the area of residence and level of awareness of the disasters that could affect them [X^2 (3) = 2.99, p-value =0.393>0.05]. It was also established that the level of awareness was higher for those in age bracket 41-50 years 72(96.0%), those who were self-employed 181(94.8%), those who completed college and university education 87(95.6%) and those who had no religion 100(100%) but is was noted that, there was no significant association between the level of awareness of the disaster that could affect the respondents with the age of the respondents and their occupation as given by the p-values of 0.485 and 0.390 respectively.

The results showed that there was a significant association between the level of education of the respondents and the level of awareness of the disaster that could affect them [X^2 (3) = 14.848, p-value =0.002<0.05].

The results also showed that there was a significant association between the religions of the respondents and the level of awareness of the disaster that could affect them [X^2 (2) = 7.090, p-value =0.029<0.05].

Table 4 Association between the informal settlement demographic characteristics and the level of awareness of the disasters that can affect the respondents in their area of residents

Demographic variables	Yes	No	N	Chi-square (X^2)	Degree of freedom	P-Value
Area of residence						
Majengo	91(91.9%)	8(8.1%)	99	**2.990**	**3**	**0.393**
Mathari	90(95.7%)	4(4.3%)	94			
Ngangarithi	98(94.2%)	6(5.8%)	104			
Ruringu	78(89.7%)	9(10.3%)	87			
Total	**357(93.0%)**	**27(7.0%)**	**384**			
Age bracket						
20-30	132(93.6%)	9(6.4%)	141	**3.457**	**4**	**0.485**
31-40	82(93.2%)	6(6.8%)	88			
41-50	72(96.0%)	3(4.0%)	75			
51-60	43(89.6%)	5(10.4%)	48			
>60	28(87.5%)	4(12.5%)	32			
Total	**357(93.0%)**	**27(7.0%)**	**384**			

Occupation						
No employment	133(91.1%)	13(8.9%)	146	**1.883**	**2**	**0.390**
Salaried employment	43(91.5%)	4(8.5%)	47			
Self-employment	181(94.8%)	10(5.2%)	191			
Total	**357(93.0%)**	**27(7.0%)**	**384**			
Level of Education						
College/ University	87(95.6%)	4(4.4%)	91	**14.848**	**3**	**0.002**
No Education	17(73.9%)	6(26.1%)	23			
Primary	89(91.8%)	8(8.2%)	97			
Secondary	164(94.8%)	9(5.2%)	173			
Total	**357(93.0%)**	**27(7.0%)**	**384**			
Religion						
Christian	250(95.1%)	13(4.9%)	263	**7.090**	**2**	**0.029**
Muslim	100(87.7%)	14(12.3%)	114			
None	7(100%)	0(0.0%)	7			
Total	**357(93.0%)**	**27(7.0%)**	**384**			

Association between the informal settlement demographic characteristics and the level of awareness of any policy rule concerned with disaster risk reduction

Association of informal settlement demographic characteristics and with awareness of any policy rule concerning with disaster risk reduction was calculated using chi-square and results recoded in table 5. The results showed that the level of awareness was higher for those reside in Ngangarithi informal settlement 63(60.6%) compared to the others. However, the results indicated that there

was no significant association between the area of residence and level of awareness of any policy rule concerning with disaster risk reduction [X^2 (3) =7.026, p-value =0.071>0.05]. It was also established that the level of awareness was higher for those in age bracket 20-30 years 75(53.2%), those who were salaried employed 26(55.3%), those who completed college and university education 54(59.3%) and those who had no religion 6(85.7%) but noted that, there was no significant association between the level of awareness of any policy rule concerning with disaster risk reduction with the age of the respondents and the occupation of the respondents as given by the p-values of 0.819 and 0.380 respectively.

The results showed that there was a significant association between the education level of the respondents and the level of awareness of any policy rule concerning with disaster risk reduction [X^2 (3) = 8.056, p-value =0.045<0.05].

The results also showed that there was a significant association between the religions of the respondents and the level of awareness of any policy rule concerning with disaster risk reduction [X^2 (2) = 10.031, p-value =0.007<0.05].

Table 5 Association between the informal settlement demographic characteristics and the level of awareness of any policy rule concerned with disaster risk reduction

Demographic variables	Yes	No	N	Chi-square (X^2)	Degree of freedom	P-Value
Area of residence						
Majengo	44(44.4%)	55(55.6%)	99	**7.026**	**3**	**0.071**
Mathari	50(53.2%)	44(46.8%)	94			
Ngangarithi	63(60.6%)	41(39.4%)	104			
Ruringu	39(44.8%)	48(55.2%)	87			
Total	**196(51.0%)**	**188(49.0%)**	**384**			
Age bracket						
20-30	75(53.2%)	66(46.8%)	141	**1.544**	**4**	**0.819**
31-40	46(52.3%)	42(47.7%)	88			

41-50	39(52.0%)	36(48.0%)	75			
51-60	22(45.8%)	26(54.2%)	48			
>60	14(43.8%)	18(56.3%)	32			
Total	**196(51.0%)**	**188(39.0%)**	**384**			
Occupation						
No employment	68(46.6%)	78(53.4%)	146	**1.936**	**2**	**0.380**
Salaried employment	26(55.3%)	21(44.7%)	47			
Self-employment	102(53.4%)	89(46.6%)	191			
Total	**196(51.0%)**	**188(49.0%)**	**384**			
Level of education						
College University	54(59.3%)	37(40.7%)	91	**8.056**	**3**	**0.045**
No Education	9(39.1%)	14(60.9%)	23			
Primary	40(41.2%)	57(58.8%)	97			
Secondary	93(53.8%)	80(46.2%)	173			
	196(51.0%)	**188(49.0%)**	**384**			
Religion						
Christian	144(54.8%)	119(45.2%)	263	**10.031**	**2**	**0.007**
Muslim	46(40.4%)	68(59.6%)	114			
None	6(85.7%)	1(14.3%)	7			
Total	**196(51.0%)**	**188(49.0%)**	**384**			

DISCUSSION, CONCLUSION AND RECOMMENDATION

Discussion of the Findings

The study found out that, majority of the respondents 93.0% was aware of the disasters that can affect them in their area of residents. Minority of the respondents 7.0% were not aware of disasters that can affect them in their area of residents. This indicate that majority of them are well informed and conscious of the disasters in their areas, which means that, an introduction of any disaster management initiative in these areas can be successful as stated by Qureshi et al. (2006), any disaster management is successful only when the general public has some awareness about the disaster. The study further established that, the level of awareness of the disasters in their area of residents was higher for those reside in Mathari, those in age bracket between 41-50 years, those who were self-employed, those who completed college and university education and those who had no religion. The results showed that there was a statistical significant association between the level of education of the respondents and the level of awareness of the disaster that could affect them. The study also established that there was a statistical significant association between the religions of the respondents and the level of awareness of the disaster that could affect them but no statistical significant association between the levels of awareness of the disaster that could affect the community and area of resident, age and Occupation.

With reference to the responses obtained from the interviewee, the study established that the most common disaster in the informal settlement of Nyeri town was fires 54.9% followed by land slide 14.3% and the least was floods 9.0% while 21.8% stated that none of the three is common in their areas.

The study found out that, majority of the residents 51.0% was aware of the existence of disaster risk reduction policies as compared to 49.0% who were not aware of any disaster risk reduction policy. This is an indication of low awareness of the existence of disaster risk reduction policy and therefore, posed danger to the lives of the residence as well as hinders the response when a disaster occurs. This is in line with Koitamet (2013) who noted that the response to fires in informal settlements in Nairobi was hindered by the lack of public awareness of fire policy and standard operating procedures during fire outbreaks. The study established that the level of awareness of the existence of disaster risk reduction policies was higher for those reside in Ngangarithi informal settlement, those in age bracket between 20-30 years, those who were salaried employed, those who completed college and university education and those who had no religion. The results showed that there was a significant association between education level of the respondents and the level of awareness of policy rule concerning with disaster risk reduction. The results also showed that there was a significant association between the religions of the respondents and the level of awareness of policy rule concerning with disaster risk reduction but no significant association with area of residents, age and occupation.

The study further established that the commonly known policies by the residents of the informal settlement of Nyeri town were Environmental policy 39.3% followed by the housing policy 37.2%, land policy 15.8% and water group policy 7.7% in that order.

The study found out that 50.3% of the residents from informal settlements of Nyeri town comply with the policy rule concerning disaster risk reduction as compared to 49.7% of residents who do not comply with the policy rules concerning disaster risk reduction. The study established that the reasons for not complying with the policy rules were that, the rules were hard to follow, others said that they are costly to follow, were not for the poor people and a few said that there was no risk that they may experience by not following the policy rules. A chi-square test was done and established that the level of compliancy was higher for those reside in Ngangarithi informal settlement 65(62.5%) compared to the other informal settlements with a significant association between the area of residence and the level of compliancy of policy rules concerned with disaster risk reduction. The results indicated that, those who were self-employed 106(55.5%) had a higher level of compliancy compared to the others with a statistically significant association between occupation and the level of compliancy of policy rules concerned with disaster risk reduction.

The study found out that most of the residents (76.0%) in the informal settlements of Nyeri town thought that the disaster risk reduction regulations/laws promote positive behavioural and attitudinal change towards disaster management as compared to 24.0% of the residents who thought that the regulations/laws do not promote any positive behavioural and attitudinal change towards disaster management. This is in line with a research conducted by Murange (2012) stated that the policies seek to promote positive behavioural and attitudinal change towards disaster management, provide a basis for the formulation of a comprehensive disaster management legal framework and establish an institutional framework for disaster preparedness, management and to establish an effective monitoring and evaluation system and provide for an effective information management system to facilitate collection, storage, analysis and dissemination of disaster management information.

The study further established that majority of the residents (81.0%) in the informal settlements of Nyeri town were familiar with the bodies that enhance disaster risk reduction laws as compared to 19.0% of the respondents who were not familiar with the bodies. The study found out that the bodies that the residents were familiar with were the County Government (59.8%), Community members (28.0%), National Government 25(8.0%) and the Individual bodies 13(4.2%).

The study established that the main action taken to individuals who would not comply with the disaster risk reduction regulations was relocation of the individuals. Other actions that could be taken to non-compliance were arresting of the individuals, stopping the individuals from settling in those areas, demolition of houses and the least action taken was eviction of the individuals from those areas.

The study further established that the most important preferred approach for improving the disaster risk reduction policies in the informal settlements of Nyeri town was bottom-up approach as indicated by 49.0% of the respondents followed by combined approach (bottom-up and top-down approaches) as indicated by (37.5%) of the respondents and the least preferred approach of improving the policies was the top-down approach as indicated by 13.5% of the respondents. Therefore, a bottom-up approach provide better aspects in improving policies related to disaster risk reduction as the community members will be allowed to air their opinions and incorporate in the policy strategies. This is in line with the study conducted by (World Water Council, 2018) who was against the top-down approach suggested that, top-down approach of governance affects initiatives in disaster risk reduction negatively because the communities are not involved and they are expected to give information of effects of disaster on economy, labour markets, infrastructure, public health and transportation.

Conclusion

Objective one sought to assess the level of awareness on the types of disasters and policies in place to curb disasters among the people living in informal settlements of Nyeri town. It was found that, majority of the respondents in the informal settlements of Nyeri town was aware of the disasters that can affect them in their area of residents and the exiting disaster risk reduction policies. The study also found that the level of awareness of the disasters and policies was higher for those completed colleges and university education with a statistical significant association. Therefore it is concluded that education level is key when addressing issues related to disaster risk preparedness in informal settlements.

Recommendations

1. (a) The study recommends that the County Government of Nyeri to review and implement a disaster management policy, develop a risk management programme, and vital records management programme. The policy should be flexible, implementable and cost effective. It should be reviewed regularly to reflect the current trends in management of disasters.

(b) The study recommends that the County Government of Nyeri should align the disaster risk preparedness plans to the County Integrated Development Plan and allocate adequate funds for disaster management in the annual budget. Allocating funds in the long term ensures the sustainability of mitigation measures and preparedness in disaster risks.

2. (a) The County Government of Nyeri needs to install firefighting systems such as fire and smoke detectors, fire extinguishers, fire blankets, sand buckets and first aid kits at strategic places in these informal settlements.

(b) Community members should be trained on how to use the firefighting systems and regularly perform fire drills. They should ensure that all electrical appliances are order, and installation

should be done by a trained electrician. They should also keep contact of telephone numbers of the firefighting brigade who can be contacted in case of an emergency.

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