

Environmental Policy and Perception as Strategic Tools for Control of Solid Waste among the Households in Zanzibar

Belonwu M. N. (MSc)
Environmental Science Unit
State University of Zanzibar,
Tanzania.
aginamnkechi@gmail.com

Okafor J. C. (PhD)
School of Health and Medical Sciences,
State University of Zanzibar
Tanzania.

Makame. O. Makame (PhD)
Department of Social and Natural Sciences,
State University of Zanzibar

Abstract

The households which as the smallest unit of the community could play the role of a garbage manager since they are the main generators of waste right from the domestic kitchen. Their perceptions on solid waste could have significant impact, communal consequences as well as environmental outcome. The goal of this study was to highlight integrating households' perceptions into planning for effective solid waste management in the environmental policy so as to achieve sustainable solid waste control in Zanzibar. The differences and similarities in the perceptions of the households (n=300) to cleaner environment were examined. Their link to the solid waste control outcome prevalent in the areas which are distinct neighbourhood in terms of settlement, street setting and demographic variables were equally examined. The satisfaction and commitment with these perceptions were explored to establish whether the link between perception and the solid waste control outcomes differ as a function of household demographic variables. As expected, most participants (approximately 65% respectively) perceived that cleaner environment is a consequent of positive perception towards solid waste management and also policy tools as strategic tools towards achieving solid waste control in their area. There is an imbalance of work identified on the part of authority concerned suggesting that they are logistically inhibited in controlling solid waste as they should through their solid waste management strategies. Perception on policy tools and cleaner environment in controlling solid waste was associated with the satisfaction and commitment to the management of solid waste observed among the households. The pattern of involvement in the management of solid waste among the households however, was different pertaining to the neighbourhood and demographic profile.

Key terms: Perception, policy tool, environment, strategies, neighbourhood, household and Zanzibar.

1. Introduction

In understanding the world around us, attention occurs first followed by sensation and finally interpretation by brain, this process of interpretation of stimulus is known as Perception. Perception is the active process of assessing information in our surroundings which involves

becoming aware of one's environment in a way that is unique to the individual and strongly influenced by communication (McGaan, 2016).

Factors such as philosophy, past experience/roles, culture /co-culture and present feelings can cause people's perception to vary but with regards to the study, perceptions will be examined among the households with regards to the environmental policy, cleaner environment and satisfaction on solid waste management strategies orchestrated in Zanzibar by the authorities concerned bearing these factors in mind.

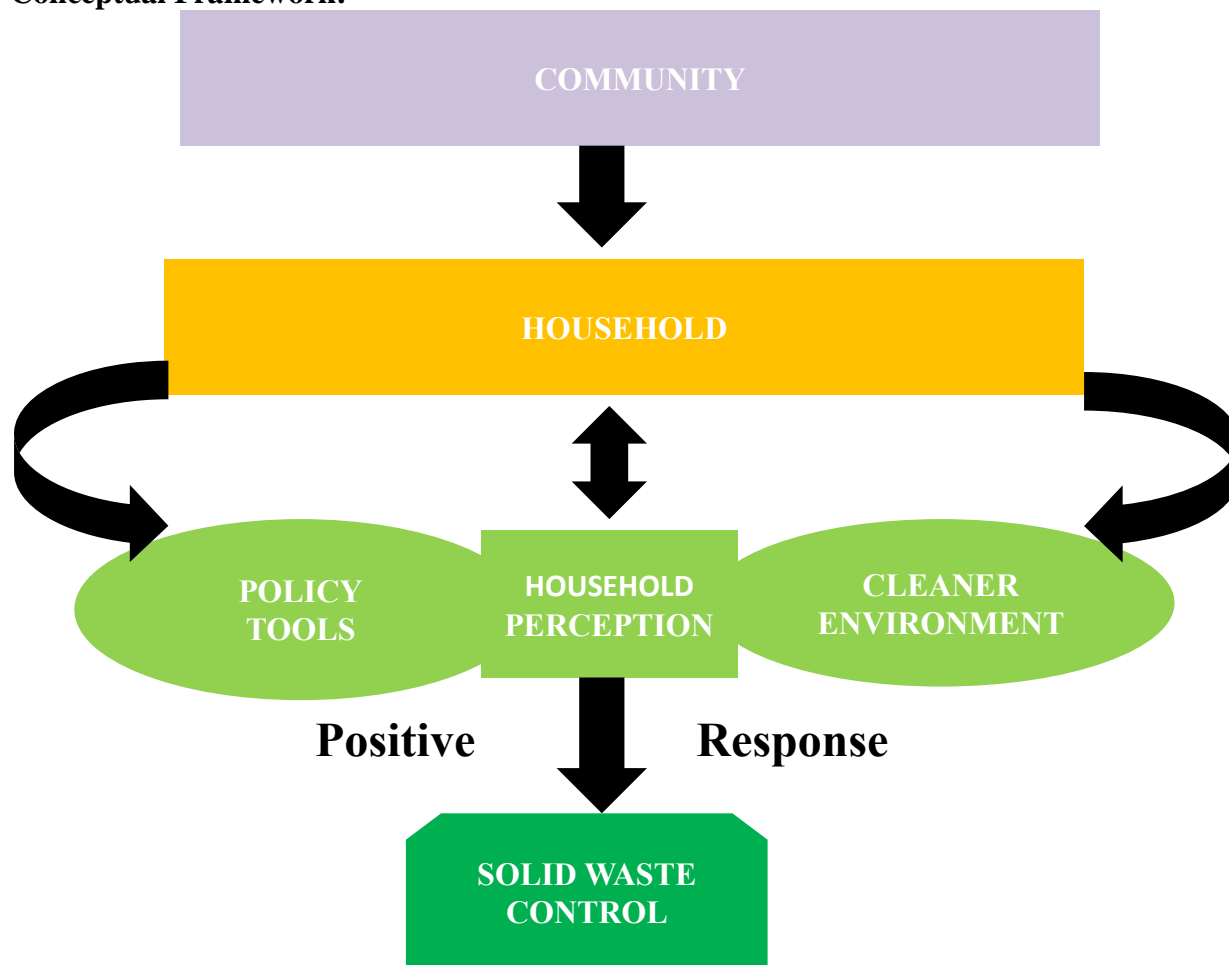
Therefore, it can be said that there is no ideal situation rather each situation is peculiar to the type of players inherent in it. These players are these different factors which act as influencers and combine to create the situation in the first place hence societies are characterised by the situations which are obtainable from the day-to-day activities of the different factors that make up the intrinsic fibres of the society. These factors revolve around human, environmental and social perceptions prevalent in the society which moulds the behavioural pattern of the different individuals that make it up.

Therefore any situation in any society can be changed when the behavioural pattern of the individual residing in it is changed. The theory of Planned Behaviour (TPB) by Azjen, 1998 explained three determinants of behavioural intervention as

- a) Opinion of oneself about the behavior (Attitude)
- b) Opinion of others about the behavior (Subjective norm)
- c) Self-efficacy towards the behavior (Perceived behaviour control)

These determinants come into play for a behavioural change to take place so this goes to show that any attitude or behaviour pattern present in any society which is viewed as inappropriate can be corrected through behavioural change of the inhabitants of that society which is always affected by the individual's perception. Attitudinal change motivates participation and this is why the researcher believes that Zanzibar environment can be better if steps are taken to change the behavioural pattern of people towards solid waste control starting from the smallest unit of the society which is the household by exploring their perception on cleaner environment and policy tools.

Conceptual Framework:



This study hinges on three important concepts which are policy tools, cleaner environment and household perception. An achievement method for solid waste control using the interrelationship between these three concepts is possible as is established in this paper. The interrelationship between these three concepts was explored through the findings from the data collected from the household questionnaire survey.

Environmental Management Policy of Zanzibar

Zanzibar has been operating various environmental management policies of which the environmental management policy act of Zanzibar enacted into law in 2015 is the most recent one and this will be used as a reference tool by the researcher in examining the effectiveness in achieving solid waste control as espoused in its goals. It encompasses the environmental obligation of the public which includes the execution of duty assigned under the act to any individual based on the following guiding principles:

- a) Precautionary Principle
- b) Polluters Principle
- c) Principle of ecosystem integrity
- d) Principle of public participation in development policies, plan and processes for the management of the environment
- e) Principle of international co-operation in management of environment
- f) Principle of common but differentiated responsibility.

The policy is divided into 16 parts and 87 sections of which the Part Eleven section 50-60 on

pollution and waste management partly stipulates the act's regulations on solid waste management is the researcher's interest due to the scope of the research. The objectives of the environmental management policy of Zanzibar centred on paving the way for the protection, conservation, restoration and management of Zanzibar environmental resources such that their capacity to sustain developmental and the rich environmental endowment for the present and future generations are not impaired, strengthening institutional mechanism needed for environmental protection and conservation of both terrestrial and marine natural resources, preventing and controlling pollution and degradation of terrestrial and marine natural resources, integrating environmental concerns into development policies, plans, programs and projects so as to sustain the ecological biodiversity and natural resources base of the country, raising public awareness and understanding of the sound environmental management so as to increase individual and community participation and enhancing local, regional and international cooperation on the environmental agenda and facilitate implementation of the conventions and protocols.(Revolutionary Government of Zanzibar,2013)

In this act, the Zanzibar Environmental Management Authority (ZEMA) is the body bequeathed with the responsibility of its implementation.

However, the Zanzibar Municipal council (ZMC) is the sole public organ responsible for solid waste management in the Zanzibar urban area. It was established in 1995 under act no 3 and operates on a by-law which came into operation on 1st September,2006.This by-law is embedded in the environmental management policy act of 2015, it is responsible for facilitating drainage and sewerage cleaning, solid waste management and formal treatment of waste in Zanzibar but it has a limited carrying capacity of solid waste pollution (Sheikh, 2015) since it has been established that it generates about 0-45-0.5kg/person/day resulting in a total of about 216 tons of municipal solid waste per day (Gauff,2005). The Zanzibar Municipal Council (ZMC) collects less than 50% of generated solid waste of which a larger percentage is of organic origin, the remaining waste is uncollected. All types of waste (hospital, domestic, institutional, industrial etc mixed and handled together in all the stages and carelessly dumped in an unsustainable manner (Revolutionary Government of Zanzibar, 2015). This impacts negatively on the socio-economic life of the people; the tourism industry, public health and environment in general.

From the enquiries made at the sanitation unit of the Zanzibar Municipal Council office, the officer in charge mentioned that there is no specific policy on solid waste in which solid waste management is emphasized rather different policies which had been enacted to make sure that the environment is kept in good condition such as the environmental act of 1992 which had no issue on solid waste management, environmental act of 1996, the by-law on solid waste management of 2006 for Zanzibar municipal council ,environmental policy act of 2013 and finally the environmental policy act of 2015 but still emphasized that those policies encompasses the whole aspect of the environment because none is a specific sanitation policy taking of care of solid waste management. Therefore the introduction of specific sanitation policy that will address the solid waste management more elaborately is paramount.

The whole idea of the solid waste management in Zanzibar is targeted at the grassroots since the local government policy is the principal policy tool they are using to carry out their activities. The use of structure of the local government assists them tremendously because the local government policy enables the establishment of officials within the 24 wards areas and the council which the main body that sees to the administration and logistics concerning the solid waste management work through the councilors which liaise with wards and the shehias for their operation to get to the grassroots hence the operational mechanism to the grassroots

Municipality→Concillors→Wards→Shehias→Grassroots

The essence of this mechanism is to put into work at the grassroots, the synergy to work and communicate to see that the problem at the grassroots get to the knowledge of the municipality on time through the various representatives and solutions proffered timely through the representatives because the municipality because the municipality cannot be everywhere.

Furthermore, even though the structure seems workable as it were, it is only on paper but there is a plan to start the implementation in no distant time.

The main policy tool use by ZMC for their operation is the By-law of 2006 which stipulates that they engage NGO's(Non-Governmental Organisations) and CBO's(Community Based Organisations) in areas like markets, certain collection points, sweeping the roads to clear the solid waste as well as cleaning up the drainages. The CBO's are engaged to support the municipal council workers and their work is made easier by his personal observation due to the collaboration because the people are more relaxed and controllable when the CBO's are involved in any of their activities. Finally, the officer reiterated that it is in the offing to create awareness of the Bye-laws of the local government on solid waste management based on undertaking public cleaning and disposal of refuse, human and animal solid waste and remains of agriculture and industry for prevention of the pollution of the environment. (Revolutionary Government of Zanzibar, 2006) as well as importance of cleanliness by educating the shehias to clean their areas hence there should be a co-ordination between the municipality and shehias to work towards achieving reasonable extent in the control of solid waste in the grassroots through the households.

*A shehia is a small administrative unit which in urban areas is demarcated and in the country side consists of one or several villages and a sheha is the head of the small administrative unit (ZSDP, 2005).

2. Materials and Method

The data set utilized in the study was collected through survey conducted in three study areas which include Mombasa ward (planned area) , a small urban settlement located in municipality B in Zanzibar town, Shanghani ward in Stone town (semi planned area) is a highbrow residential area located inside Stone town between the foradani parks and Vuga while Nyerere ward in Ng'ambo (unplanned area),a densely populated area whose inhabitants are mainly the low-class and emerging middle-class in the society is located along the airport road and bounded to the north by Amani ward, to the east by Magogoni ward and to west by Sebleni and Sogea wards.

These three sites located in urban west region of Zanzibar are in the urban municipality. And were purposely selected as each site represents a distinct neighbourhood which varies in terms of settlement, streets setting and demographic characteristics.

Method:

A sample size of 300 households among the study areas was selected through systematic random sampling and the collection of data was done by administering structured questionnaires to selected households while personal interviews of key informants in the stakeholder institution and private company was also conducted so as to obtain an all-round information on the environmental policy, household perception and management of solid waste in those areas.

A response rate of 98% was established though 294 out of the 300 questionnaires distributed

were returned and used for the data analysis.

The questionnaires pattern was divided into three sections: section one collected the demographic profile of the respondents, Section two assessed the perception of the household on cleaner environment; section three assessed the perception of the household on policy tools.

The used questionnaire was checked for its validity and an excellent reliability coefficient of 0.9 was obtained using the Cronbach's alpha test. The data solicited through the questionnaires was analyzed using the statistical package, SPSS (version 23) and their basic descriptive features were expressed using the measures of central tendency inform of mean, frequency, simple percentages and graphs.

3. Results

Perception of the Respondents on Cleaner Environment

Table 1: Respondents' awareness of cleaner environment

Response	Yes	No	Uncertain
Frequency	285	5	4
Percentage	96.5	1.7	1.4

Table 2: Respondents' perception about whose responsibility it is for keeping the environment clean

Response	Government	Community	Household	Individual	All of above
Frequency	33	55	8	33	165
Percentage	11.2	18.7	2.7	11.2	56.1

Almost all the respondent are aware about what it means to have a clean environment (96.5%,n=285).About (18.7%,n=55) of the respondents feel that it is the responsibility of the community to clean the environment, about (11.2% n=33) feels that the government and the individual should be responsible for it, (2.7%,n=8) feels that the responsibility lies with the household while the rest (52.1%.n=165) feels it should be the responsibilities of the community, the government, the individual and the household.

Table 3: Respondents' that prefer to clean the environment

Response	Always	Twice a day	When dirty	Don't have time to clean
Frequency	230	24	38	2
Percentage	78.2	8.2	12.9	0.7

Table 4: Respondents' that prefer to participate in sanitation exercise

Response	Yes	No	Uncertain	I don't care
Frequency	212	51	26	5
Percentage	72.1	17.3	8.8	1.7

From Table 3 and 4, majority of the respondents prefer to clean their environment always (78.2%, n=230) and greater part of the respondents participate in sanitation exercise (72.1%, n=212) in their vicinity.

Table 5: Respondents' perception on achieving solid waste control by having cleaner environment through proper waste disposal

Response	Strongly agree	Agree	Strongly disagree	I don't know
Frequency	143	133	10	8
Percentage	48.6	45.2	3.4	2.7

Almost all of the respondents (93.8%, n=276) agreed that solid waste control can be achieved through cleaner environment.

Perception on Policy Tools

Table 6: Respondents' knowledge about the environmental management policy act of Zanzibar

Response	Yes	No	Uncertain
Frequency	244	42	8
Percentage	83.0	14.3	12.7

Table 7: Respondents' awareness of the policy tools

Response	Yes	No	Uncertain	I don't care
Frequency	220	40	19	15
Percentage	74.8	13.6	6.5	5.1

Majority respondents (83.0%, n=244) have the knowledge of the environmental policy act of the Zanzibar nation while about (78.6%, n=220) of them are aware of the policy tools inherent in the policy act.

Table 8. Respondents' source of information

Response	Newspaper	Television	ZMC worker	Internet	Others
Frequency	24	99	107	11	3
Percentage	9.8	40.6	43.9	4.5	1.2

About (40.6%, n=99) of the respondents got their information through the Television, (43.9%, n=107) got it through the ZMC workers while a few got it through the internet (4.5%, n=11) and other means (1.2%, n=3) like neighbours etc.

Table 9. Respondents' abiding by the policy tool

Response	Yes	No	Uncertain	I don't care
Frequency	206	46	16	26
Percentage	70.1	15.6	3.4	8.8

Majority of the respondents that claimed to abide by the policy act was about (70.1%, n=206) and (15.6%, n=46) claimed not to abide by it despite the knowledge they have about the existence of the policy act and awareness about the policy tools while about (12.2%, n=42) of the respondents are uncertain and don't care about it.

Table 10. Respondents' perception on achieving solid waste control by having a cleaner environment through enforcement of policy tools

Response	Strongly agree	Agree	Disagree	Strongly disagree	I don't know
Frequency	90	99	72	4	29
Percentage	30.6	33.7	24.5	1.4	9.9

Majority of the respondents (64.3%, n=189) agreed that solid waste control can be achieved through cleaner environment by enforcing the policy tools.

Perception and Location

Table 10. Results based on analysis of perception towards cleaner environment with respect to Location:

Perception on Policy tools	Mombasa	Nyerere	Shangani	Total
Positive	66 66.7%	110 73.2%	25 54.3%	201 68.4%
Negative	33 33.3%	39 26.8%	21 45.7%	93 31.6%
Total	99 100.0%	149 100.0%	46 100.0%	294 100.0%

	Value	Df	Pvalue
Pearson chi-square	6.3666 ^a	2	.041

There was a statistically significant relationship between perception on cleaner environment and location. $p < 0.05$

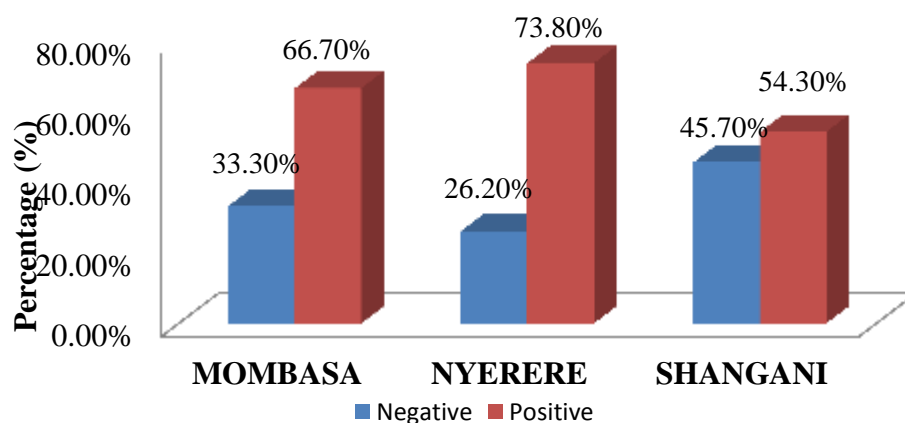


Figure 1: Establishing relationship between Perception on cleaner environment and Location.

Table 11. Results based on analysis of perception on policy tools with respect to Location:

Perception on Policy tools	Mombasa	Nyerere	Shangani	Total
Positive	66 66.7%	109 73.2%	26 56.5%	201 68.4%
Negative	33 33.3%	40 26.8%	20 43.5%	93 31.6%
Total	99 100.0%	149 100.0%	46 100.0%	294 100.0%

	Value	Df	Pvalue
Pearson chi-square	4.696 ^a	2	.096

There was a statistically significant relationship between perception on policy tools and location. $p < 0.05$

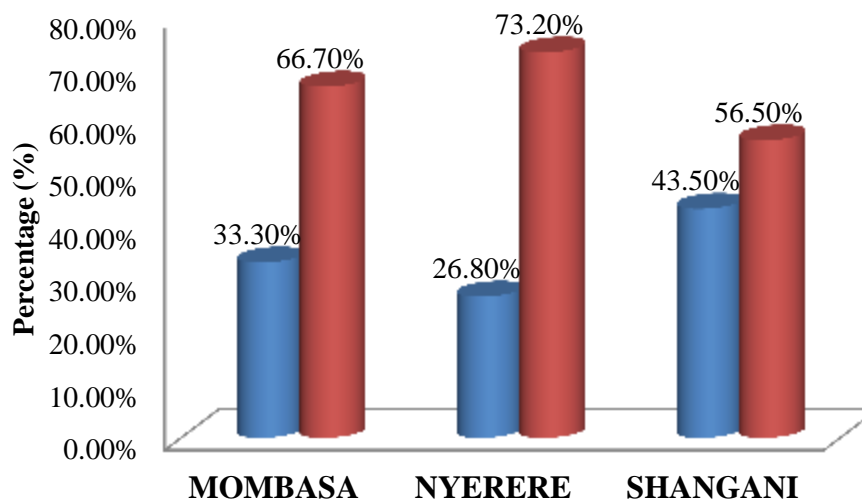


Figure 2: Establishing relationship between perception on policy tools and location.

Perception and Demographic Variables

The demographic profile of the respondents provided the variables that were investigated to analyze their perception to examine if there were differences, similarities, satisfaction and commitment as a result of these perceptions. The results of the study revealed that out of the 294 households that responded, 170(57.8%) were females and 124(42.2%) were males. It was observed that there was a large turnout of women that participated in the survey. Most of the respondents in the survey aged 26-40years accounted for more than 69.4% while respondents ranging from 40 and above were 29.2%. Over 68.4% respondents involved in the survey had Primary education and above while respondents with no formal education were 31.6%. About 47.3% of the respondents are gainfully employed while the rest are unemployed. Finally about 45.2% of the respondents are married and 6.2% are either

widowed or divorced while 48.6% of the respondents are single. The detailed demographic profile of the respondents is represented on Table 12.

Table 12: The Demographic profile of the Respondents

		Frequency	Percentage
Gender	Male	124	42.2
	Female	170	57.8
Age	25 – 40	204	69.4
	41 - 55	77	26.2
	56 – 70	13	4.4
Occupation	Professional	74	25.2
	Semiskilled	21	7.1
	Skilled	2	0.7
	Unskilled	42	14.3
	Unemployed	155	52.7
Marital status	Single	143	48.6
	Married	133	45.2
	Widowed/ Divorced	18	6.1
Education	No formal	93	31.6
	Primary	3	1.0
	Secondary	126	42.9
	Post-secondary	14	4.8
	Tertiary	58	19.7

Relationship between Demographic Variables and Perception

Table 13: Gender*Perception on cleaner*perception on Policy tools

Gender	Perception on cleaner environment		Perception on Policy tools	
	Positive	Negative	Positive	Negative
Male	72 58.1%	52 41.5%	79 63.7%	45 36.3%
Female	129 75.9%	41 24.1%	122 71.8%	48 28.2%
Total	201 68.4%	93 31.6%	201 68.4%	93 31.6%

There was a statistically significant relationship between respondent’s gender, perception on cleaner environment and perception on policy tools. $p < 0.05$

Gender*cleaner	Value	Df	Pvalue
Pearson chi-square	10,526 ^a	1	0.001

Gender*policy tools	Value	Df	Pvalue
Pearson chi-square	2.156 ^a	1	.0.142

Table 14: Age * Perception towards cleaner environment *Perception on Policy tools

Age	Perception on cleaner environment		Perception on Policy tools	
	Positive	Negative	Positive	Negative
25-40	149 73.0%	55 27.0%	144 70.6%	55 27.0%
40-55	45 58.4%	32 41.6%	50 64.9%	32 41.6%
55-70	7 53.8%	6 46.2%	7 53.8%	6 42.6%
Total	201 68.4%	93 31.6%	201 68.4%	93 31.6%

Age*cleaner	Value	Df	Pvalue
Pearson chi-square	6.834 ^a	2	0.033

Age*policy tools	Value	Df	Pvalue
Pearson chi-square	2.152 ^a	2	0.341

There was a statistically significant relationship between age group of respondent and perception on cleaner environment. $p < 0.05$

Table 15: Occupational Status *Perception towards cleaner environment*Perception on Policy Tools.

Occupation of Respondent	Perception on cleaner environment		Perception on Policy tools	
	Positive	Negative	Positive	Negative
Professional	55 74.3%	19 25.7%	63 85.1%	11 14.9%
Semi-Skilled	14 66.7%	7 33.3%	14 66.7%	7 33.3%
Skilled	1 50.0%	1 50.0%	1 50.0%	1 50.0%
Unemployed	106 68.4%	49 31.6%	95 61.3%	60 38.7%
Unskilled	25 59.5%	17 40.5%	28 66.7%	14 33.3%
Total	201 68.4%	93 31.6%	201 68.4%	93 31.6%

Occupation*cleaner	Value	Df	Pvalue
Pearson chi-square	3.073 ^a	4	0.0546

Occupation*policy	Value	Df	Pvalue
Pearson chi-square	13.306 ^a	4	0.009

There was a statistically significant relationship between the occupational status of respondent and perception on policy tools. $p < 0.05$

Table 16: Marital status * Perception towards cleaner environment

Marital Status	Perception on cleaner environment		Perception on Policy tools	
	Positive	Negative	Positive	Negative
Single	106 74.1%	37 25.9%	103 72.0%	40 28.0%
Married	80 60.2%	53 39.8%	84 63.2%	49 36.8%
Separated / divorced	15 83.3%	3 16.7%	14 77.8%	4 22.2%
Total	201 68.4%	93 31.6%	201 68.4%	93 31.6%

Marital status*cleaner	Value	Df	Pvalue	Marital status*Policy tools	Value	Df	Pvalue
Pearson chi-square	8.209 ^a	3	0.016	Pearson chi-square	3.392 ^a	2	0.193

There was a statistically significant relationship between marital status of respondent and perception on cleaner environment. $p < 0.05$

Table 17. Education * perception towards cleaner environment

Education	Perception on cleaner environment		Perception on Policy tools	
	Positive	Negative	Positive	Negative
No formal	59 63.4%	34 36.6%	48 51.6%	45 48.4%
Post secondary	7 50.0%	7 50.0%	7 50.0%	7 50.0%
Primary	2 66.7%	1 33.3%	2 66.7%	1 33.3%
Secondary	89 70.6%	37 29.4%	89 70.6%	37 29.4%
Tertiary	44 75.9%	14 24.1%	55 94.8%	3 5.2%
Total	201 68.4%	93 31.6%	201 68.4%	93 31.6%

Educations*cleaner	Value	Df	Pvalue	Education*cleaner	Value	Df	Pvalue
Pearson chi-square	5.038 ^a	4	0.283	Pearson chi-square	33.336 ^a	4	0.0001

There was a statistically significant relationship between the educational status of respondent and perception on policy tools. $p < 0.05$ but there exists none between educational status and perception on clean environment.

4. Discussion on Findings

Perception as the active process of assessing information in our environment involves becoming aware of the environment in a way which is unique to an individual and is strongly influenced by information,(MacGaan,2016).The household is intrinsically involved in solid waste management because it is through them that “Waste from Wealth” can be realized.(kumar,2013).Therefore their perception about solid waste management will determine how they respond to its practice and services since it is through perception that individuals organize and interpret their sensory impression in order to give meaning to their environment.

Perception on Cleaner Environment

Perception on cleaner environment survey was conducted among the two hundred and ninety-four (294) households in the respective study areas and it was observed that majority (96.9%) of the respondents are aware of the meaning of a cleaner environment which they believe should be a holistic venture which was demonstrated by more than half of them (56.1%) responding that keeping the environment clean involves the government, the community, the household, the individual. This is a positive mind set which if nurtured will culminate into individuals that will be conscious of not littering their surrounding with dirt. This trend of positive perception towards cleaner environment can be explained by the increased consciousness people have about living in a clean environment due to information widely available now that health is wealth and to be healthy one must live in a clean environment. The age group 25-40years has the highest rate of positive response and the highest number of married/single people. The reason for this may not be unconnected with the maturity and sense of responsibility exhibited by this age group. Therefore, it shows from this survey that age and marital status can play a role in determining the level of consciousness an individual can have with regards to have a clean environment and how to achieve it.

A majority of the respondents (78.6%) preferred to clean their environment daily while a few (12.9%) preferred to clean the environment only when it is dirty. This shows that the people have good sense of cleanliness and want their environment to be clean hence will be willing to do the right things concerning the management of their waste. This makes it easier for the bodies responsible with management of solid waste if they put workable measures on ground to achieve solid waste control.

The high rate of willingness to keep the environment clean can be attributed to the higher number of female respondents witnessed during the survey and this may have contributed to the statistically significant association observed between gender and perception on cleaner environment. This will not be unconnected with the fact that survey which has a domestic setting tends towards the female gender because they are naturally linked to keeping the home clean and in good condition. Similar studies in Uganda, Pakistan, Bangladesh and Vietnam also showed that women were more enthusiastic and more involved in source separation of waste than men (Du (1995); Beall (1997) and Banga (2013)).

General sanitation exercise is a community oriented exercise in which the individuals residing in a community comes together to do a general clean-up of their residential or commercial environment. it is more of team-work and commitment to the common good. A high number of the respondents (72.1%) preferred to participate in a general sanitation exercise while a few of the respondents (17.3%) responded negatively. This shows that if such a programme is introduced by the authorities in charge of solid waste management, a lot of people will be interested to participate which will in-turn rub-off on the few that didn't

show interest. Therefore, this raises a concern for the bodies responsible for the solid waste management to explore this avenue as a community intervention to achieving solid waste control. This can be encouraged by the authorities establishing the best means of educating these people on what is exactly expected of them during the exercise and how it can be conducted appropriately. The aim is to orientate people to take care of their environment as a matter of personal willingness and commitment because more would be achieved by freewill involvement than by enforcement. The personal willingness and commitment if cultivated impacts positively on their perception and can make people to be watchdogs over themselves as they have collective commitment to clean the environment together. This exercise if carried out at least once every month is capable of making the households more conscious of living in a clean environment hence leading to the much desired solid waste control.

The location as the case may be influences the perception on cleaner environment of its inhabitants as this can be linked to the type of neighbourhood the inhabitants are living. The households residing in the unplanned area(Nyerere;73.8%) responded more positively than in the planned area (Mombasa;66.7%) and semi-planned area(Shanghani;54.3%).This is as result of the fact that people residing in the unplanned area are mainly the poor people whom due to their similar life situation are more closely-knitted to each other and prone to come together as a community unlike the rich and bourgeois residing in the semi-planned and planned areas whom feel that everything is going on well for them hence more individualistic and proud. Solid waste control can be optimistically achieved by having a cleaner environment through proper disposal of waste as many of the respondents strongly agreed through their affirmation while very few of the respondents disagreed with about only eight respondents felt that the problem of waste is not their problem probably as they are used to staying in an environment littered with waste for a very long time.

Despite the high number of the respondent who affirmed that proper disposal of waste can curb solid waste littering the environment, it was observed it was not the real situation because improper disposed waste was visible in those environments and this can be linked to lack of commitment on the part of the respondent to do what is right. Also due to their busy schedule in the daily life, many of the respondents may just want to dispose their waste out the house without minding where they put the waste. This attitude was associated to occupational status and perception on cleaner environment because out of the two hundred and ninety-four respondents (294) that took part in the survey, one hundred and eighty-eight were gainfully employed while the rest are unemployed showing that if these employed portion of the sampled population with busy schedules adjust to doing the proper thing as at when due, a great improvement will be achieved in solid waste control. Then the unemployed whose schedule may not be as busy as that of the employed should show commitment to the above statement to which most of them agreed to.

Finally, it was established that education has no influence on respondent's perception on cleaner environment hence goes to show that the level of one's education does not indicate the cleanliness of the respondents so the important trait is to be conscious of the benefits of living in a clean environment.

4.3.3: Perception on Policy Tools

The study revealed that about (83.0%) have the knowledge about the existence of environmental management policy of Zanzibar. This increased awareness from our study could be explained by the increased information that widely available through the media owing to the fact that the media was recognised by the Zanzibar Environmental Policy of

2013 as an important tool for public environmental education. The use of different media for increasing community awareness, participation and compliance with environmental policies was highly recommended (SMZ,2013).Some of the respondents got their information from Television (40.6%), newspaper (9.8%) and internet (4.5%) but most importantly the study shows that many of the respondents got their information from the municipality through the ZMC workers (43.9%) showing that the municipality plays a considerable role for the provision of information to the community. This shows that if the bodies responsible for solid waste management services and practices explore these avenues more by disseminating information and educating people through the media such as televising etc as well as increasing the training capacity to accommodate more of the ZMC worker, the public can be informed about more of what is expected of them by the policy because part of the problem of solid waste control is inadequate information about the policy tools which gives out the regulations for achieving sustainability of the environment.

A high number (74.8%) of the respondents are aware of the policy tools and equally a high number of (79.1 %) of them responded that they abide by the policy tools. This goes to reiterate the fact that the problem of solid waste in Zanzibar borders more on proper implementation and enforcement.

The people are aware and from statistics, most of them abide by the policy tools yet the prevalence of solid waste in and around the vicinity is overwhelmingly alarming so it becomes questionable if the mere provision of information is sufficient to enable and induce participants to apply their knowledge and implement sustainable behavioural change. This is why the researcher feels that the stakeholders should go back to the drawing table to device workable strategies to make these people that already know these tools put them into practice so that the set objectives of the policy about achieving a clean and sustainable environment can be feasible.

This also calls for sincere commitment on the part of the respondents to be determined to do the right thing for the common good because if there is sincere commitment, people will continue to do the right thing even when there is loose enforcement.

During the oral interview, a lack of knowledge about the policy tools among the municipal official was observed and this was indicated as a common problem by the State of the Environment Report 2004/2005(Zanzibar Department of Environment 2005).This insufficient knowledge and responsibility of the authorities encouraged indifference and lack of compliance by the people. Thus, there is need for the total overhaul of the system so as to get things done properly.

Majority of the survey participants (64.3%) agreed that solid waste control can be achieved through cleaner environment by enforcing the policy tools because the participants complained that there is no penalty of which they are aware that is meted out to a defaulter as consequence for defaulting the policy regulations. This encourages unchanged behaviour on the part of the offender and reflects the non-existence prosecution of the law at community level.

The study revealed that there was no statistically significant association between location and perception on policy tools ($p>0.05$) as well as there was no statistically significant association between age group and perception on policy tools ($p<0.05$). This can be justified because despite the variations in awareness and abiding by the policy tools observe in-between the three different study areas ranging from 56.5% in Shanghani to 78.8% in Mombasa, poor

solid waste management behaviour was still exhibited.

But there was a statistically significant association ($p < 0.05$) between perception on policy tools and gender, marital status, occupational status and education respectively showing that the perception the respondents from the households have on policy tools is possibly influenced by the mentioned socio-demographic factors.

5. Conclusion and Implication

This study concludes that examining the influence of household perception on solid waste control should be given more attention as a burgeoning field in strategizing the curbing of solid waste menace since the execution of any action stems from intention. A good intention will materialise into a good action. Hence, the introduction of specific sanitation policy that will address the solid waste management more elaborately is of paramount importance because it will serve as a guide and yardstick to model people's intention towards community awareness, good perception on cleaner environment and policy tools of the existing environmental policy act.

Furthermore the diverse and insufficient solid waste management infrastructure and inadequate alternatives prevalent in Zanzibar which furthers the occurrence of environmental strains observed can be contained through a search for a comprehensive, coordinated and governmental planning that if combined with adequate legislation, adequate fiscal provision, public involvement and awareness will bring about the expected improvement in the quality of the environment (Omuta, 1988). This is the only way to ensure sustainable solid waste control in Zanzibar.

6. Recommendation

The importance of motivation through provision of incentives inform of adequate waste bins and garbage bags and conduction of intensive sanitary campaign at the grass root level as established from the study cannot be overemphasized as measures that can create the much needed commitment, consciousness and co-operation between the households and the stakeholders.

There should be good orientation that will channel people's mind towards achieving solid waste control through coaching, mentoring and keeping the history of achievement by including Environmental education in the school curriculum. The authorities should endeavour to prioritize sustainable solid waste management practices and services so as to stamp its importance in the citizen's perceptions

The significant gender effect recorded during the survey inform of the high turnout of the women is good asset for achieving solid waste control because it indicates that the women have more positive perception, more interested, committed and thorough in the areas of environmental cleanliness and clean up than their male counterparts so can be good assets for providing the much needed sanitary service as waste management "guards" to mount surveillance within their neighbourhood when properly guided (Belonwu *et al.*, 2017).

7. Limitations and Future Research

This study helps to fill the gap in the literature concerning the degree perception can go in assisting control of solid waste among the households. The primary strength of this research is that it investigated the household's perception through an age range that will give relevant interpretation to what they perceive about their environment and environmental policy with regards to the solid waste management. Also the choice of using distinct neighbourhoods gave its own credence to the study by contributing to literature in terms of examining if the

type of neighbourhood a household is located has any influence on the perception of its inhabitants towards cleaner environment and policy tools in such a way that the outcome may affect the status of solid waste management observed in the location.

However, as is the case with empirical investigation, some discrepancies came up during the process as the studies has its own limitations which stems from the fact that even though different areas were used as pilot units, it may not generalise to the wider population. This is due to the nature of subject being investigated which is perception. There are individual differences as a result of factors (as enumerated in the introduction) which cause perception to vary from one individual to another. Further research is highly encouraged to examine to what degree the perception of the households is relatively consistent and to find out other factors which can affect it. Also, further research should endeavour to unearth the best approach towards obtaining the necessary change in perception so as to achieve the required attitude that can change the prevalent nonchalance towards sustainable solid waste management in Zanzibar.

Finally, in a generalized manner, future research can delve into exploring if there are other environmental outcomes that occur as a result of the perceptions of individuals which may influence the satisfaction and commitment towards solid waste management practices and services so as to improve it in Zanzibar.

References

- Ajzen, I. (1998). Theory of Planned Behaviour .Organisational Behaviour and Human Decision Processes, 50(2), 179-211.
- Gauff, H. 2005. *Zanzibar Sanitation and Drainage Program(ZSDP),Feasibility Study In Solid Waste Volume: Technical Report For Zanzibar Municipal Council.* Zanzibar.
- Kumar M, N. N. 2013. Community Attitude Perception and willingness towards Solid waste management in Bangalore City India. *International Journal of Environmental Science Vol 4 (1).*
- McGaan, L.2016.Communication and Perception.Fundamentals of communication [online]. Available from www.department.monm.edu/cata_101. [accessed 21st September 2017].
- Omuta, G. 1987. Urban Solid Waste Generation and Management in Nigeria Towards an Environmental Sanitation Policy:. *Elsevier, Habitat International. Vol. 11(2) , 77-87.*
- Revolutionary Government of Zanzibar 2006. *Bye law for solid waste management, Zanzibar Municipal Council,ZMC..*
- Revolutionary Government of Zanzibar 2013. *Zanzibar Environmental Policy ,Zanzibar: The Vice President's Office ,Department Of Research.* Zanzibar.
- Revolutionary Government of Zanzibar 2014. *Zanzibar Local Government Authority Act 2014,Zanzibar Municipal Council,ZMC.*
- Revolutionary Government of Zanzibar 2015. *Zanzibar Environmental Act,2015 Zanzibar,The Vice President's Office,Department of Research Zanzibar..*
- Revolutionary Government of Zanzibar 2015. *Zanzibar Research Agenda 2015-2020.*