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Mwangi, Albert Maina, Dr. Richard Kerich, Dr. Theresa C. Aloo

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TRADER'S FISH HANDLING PRACTICES, PERCEPTIONS ON ENVIRONMENTAL MANAGEMENT AND LEVEL OF AWARENESS ON GOVERNMENT'S SANITATION GUIDELINES IN GIKOMBA MARKET, NAIROBI

[1*]Mwangi, A. Maina

[1*]Post graduate student, Kenyatta University

*Corresponding Author's Email: albmwangi@yahoo.com

[2]Dr. Richard Kerich

Lecturer, Kenyatta University [3]

Dr. Theresa C. Aloo

Lecturer, Kenyatta University

Abstract

Purpose*:* The purpose of the study was to identify the trader's fish handling practices, perceptions on environmental management and level of awareness on government's sanitation guidelines in Gikomba market, Nairobi.

Methodology: A descriptive survey design was used for the research. The target for the study was the fish traders of Gikomba fish market, Nairobi. Random sampling of fish traders was done from a register, using Fischer's formulae, to calculate the number of respondents. Data was collected through a structured questionnaire and was processed using EXCEL and SPSS software packages. Descriptive statistics (frequencies, percentages,) and inferential statistics (Chi square and Logistic Regression) were used to explain the variables. 54% of the respondents did not get piped water.

Results: The overall findings led to a support of the key research hypotheses that fish handling practices is significantly related to the environmental situation ($P<0.05$), perception on environmental management is significantly related to the environmental situation ($P<0.05$), and awareness on institutional guidelines is significantly related to the environmental situation($P<0.05$).

Unique contribution to theory, practice and policy: The research recommended that Emphasis should be put on disposal of fish wastes in the major fish markets, fish wastes recycling options, training of fish operators and capacity development of staff.

Key words: *Traders, environmental management, market, Sanitation Guidelines*

1.0 INTRODUCTION

1.1 Background of the Study

The Kenya fisheries sub sector has significantly contributed to the national economy through employment creation, foreign exchange earnings, poverty reduction and food security support. Fish production data for the year 2012, shows that during the period,5126.23 MT of fresh water fish valued at 559,939,800 Kshs and 68.5 MT of marine fish valued at 18,829,000 Kshs was traded in Nairobi (Nairobi Province Fisheries Annual Report 2012). This is against a national production of 150,000MT (Fisheries Bulletin 2012). The report cites that fish market's poor sanitation and lack of physical facilities as some of the challenges experienced in the fish marketing outlets.

Fish contamination especially with pathogens like *Salmonella sp., Staphylococcus aureus, Escherichia coli, Vibrio parahaemolyticus*, may occur at various stages in fish chain including prior to harvest, during capture, processing, distribution or storage (Venugopal, 2002). The increased irresponsible fish waste disposal, dumping of litter and rubble, has led to severe impacts on the health of the environment.

Behavior change in fish wastes disposal practices and proper waste management, improved sanitation, increased water quantity and healthy hygiene practices, may all contribute to controlling the state of the environment. Proper fish waste disposal and effective sanitation management in the fish markets will therefore, help to create a cleaner, healthier environment. One alternative waste management technique is the urban poor's re-use of refuse. Waste recycling is often undertaken as a survival strategy when the urban poor are unable to obtain formal employment, and when non-waste resources are scarce or unaffordable. Reducing the total amount of solid waste headed for the landfill (or left lying to rot in the streets); recycling and composting are land-saving and pollution-reducing strategies. Waste re-use also plays a valuable resource-conserving role by recycling materials further, exploitation of scarce natural resources is minimized, thus containing the spreading ecological footprint of the city. Despite these environmentally and socially beneficial aspects of waste recycling, it is not without its negative impacts, which include exploitation by waste buyers and poor health and living conditions for the urban poor who deal in waste picking (Furedy,1992).

Kenya has made efforts to put in place policy structures necessary to manage waste. On the ground however implementation of these policies are weak and that is why waste continues to be a major challenge in all urban centers. Instead of waiting to deal with environmental crises caused by wastes, preventive and precautionary measures can be activated within the households through use of technology, education and awareness campaigns and the law simultaneously (Waswa *et al.*, 2007). This approach can be pursued at the fish market levels. The other options available for disposal of fish waste is through utilization e.g. use in fertilizers, animal feeds, but are rarely pursued in Kenya. The recycling of solid and organic waste is one approach that has positive ramifications in creating informal employment and offering an environmentally sound solution to waste management problems.

Majority of domestic fish markets are unhygienic and the fish storing and handling facilities are poor. There is also a lack of proper and adequate fish handling facilities and basic equipment. Availability of potable water, good quality ice and waste disposal system is inadequate.

1.2 Problem Statement

The current environmental situation in fish markets raises concerns on whether the level of awareness on government institutional sanitation guidelines, poor perception on sanitary management and deficient fish handling practices may be the contributing factors.

Environmental management at Gikomba market is evidently constrained, primarily, by logistical factors, which presumably include inability and difficulties in waste collection by local authorities for transport to the disposal centers. Lack of basic facilities to handle fish in markets, ignorance on appropriate disposal of fish wastes or recycling for useful by-products are some of the identified challenges in fish markets. Generally, capacity among stakeholders (technocrats, extension agents, fish traders) in addressing sanitary situation issues are some of the factors that needed to be examined to understand how they relate with the environmental status in the market.

1.3 Research Objective

The main objective of the study was to identify the trader's fish handling practices, perceptions on environmental management and level of awareness on government's sanitation guidelines in Gikomba market, Nairobi.

2.0 LITERATURE REVIEW 2.1 Empirical Studies

Fish processing generates large amounts of solid waste or residue of high nutrient content which if not properly utilized or treated is likely to be deposited in the environment creating pollution and health problems (Hwang and Hansen, 1998).The general principles of the Code of Conduct for Responsible Fisheries (CCRF) is that the harvesting, handling, processing and distribution of fish and fishery products should be carried out in a manner which will maintain the nutritional value, quality and safety of the products, reduce waste and minimize negative impacts on the environment. Consideration should be given to the reduction of wastes at source, the recovery of value/utility waste, the final disposal of waste in descending order of preference. Waste should be managed as near as practicable to their point of production to mitigate the costs and impacts during transportation (FAO, 2003). Further, this waste must be stored so as to prevent the contamination to the processing environment, and should be disposed of in a manner that is not detrimental to the receiving environment. The magnitude of the problem of waste management in the fish industry depends on the waste volume, its polluting charge, rate of discharge and the assimilatory capacity of the receiving medium.

Thus, the absence of suitable facilities (equipment and infrastructure); the underestimates of waste generation rates, the inadequate management and technical skills, along with improper route planning are largely responsible for poor collection of municipal solid wastes (Bolaane and Ali, 2004; Hazra and Goel, 2009).

According to Gumisiriza *et al,* (2009), currently, there are limited options available for reuse or recycling of fish wastes and there is need to employ modern fish waste management options to circumvent inefficient management of fish wastes in East Africa.

In many countries, solid fish waste is recycled into fish meal or treated along with the municipal waste, whereas liquid waste is disposed of through the municipal sewage system or directly into a water body. In the latter case, care must be exercised to ensure that the receiving water body can degrade the biological and chemical constituents of the waste in a manner that is not detrimental to the aquatic fauna and flora. There are several challenges that face any integrated municipal solid waste management system when source reduction is attempted. Challenges include the fact that that the consumer and the system have no control of the products that enter

a certain locality; the economic and institutional barriers to instituting source reduction programs; and the amount of reduction versus the effort and costs to reach that amount (Mwaura,1991).

Although there has been progress in managing the fish processing and trade activities, the management of the volume of fish waste in fish markets currently generated is an issue that needs to be addressed. Disposal of fish wastes is in uncontrolled dumpsites, possibly occasioned by lack of disposal facilities like waste bins or lack of awareness about waste disposal, is the norm. Blocked drainage because of fish scales, trim offs is a challenge that complicates the environmental situation.

Ogunja (1992) notes that, in developing countries like Kenya, there is limited appropriate technologies and practices for fish waste management (innovative technologies, good practices along the waste management chain e.g. reduce volume of waste, recycling). This partly, may be due to inadequate or fragmented research and poor information flow among stakeholders to inform policy formulation. Recycling is something that Kenyans must come to terms with if we are to adopt an integrated solid waste management approach.

3.0 RESEARCH METHODOLOGY

A descriptive survey design was used for the research. The target for the study was the fish traders of Gikomba fish market, Nairobi. Random sampling of fish traders was done from a register, using Fischer's formulae, to calculate the number of respondents. Data was collected through a structured questionnaire and was processed using EXCEL and SPSS software packages. Descriptive statistics (frequencies, percentages,) and inferential statistics (Chi square and Logistic Regression) were used to explain the variables. 54% of the respondents did not get piped water.

4.0 RESULTS AND DISCUSIONS

4.1 Trader's fish handling practices, perceptions on environmental situation and awareness on institutional guidelines.

4.1.1 Fish operator's fish handling practices

Table 4.1 shows that 34.5% of the respondents indicated that the state of their fish when receiving it for sale was preserved in adequate ice. Huss (2003), noted that the highly nutritious properties of fish flesh provides an excellent substrate for the growth of most heterotrophic bacteria and the composition affects the bacterial growth and related biochemical activities, hence the need to keep fish at low temperatures. Ice provides that low temperature medium. The low level of use of adequate ice in Gikomba market may therefore compromise the quality of fish sold. Food processing establishment's major goal is to control microorganisms in order to provide safe, wholesome and acceptable food to the consumers (Baggen-Ravn *et al*., 2003). However, this can be challenging as contamination of the products take place at all stages of the food chain (De Roover, 1999).

Adequate water is very important in fish handling establishments. 54% indicated that they received water for fish processing somehow (from vendors and other sources), though only 25% received piped water, with the rest receiving no water. It may be argued that not all operators require water as some of them trade in smoked or sun-dried products that do not require water to process.

Most of the respondents (63.5%) indicated that they had no waste bins in this market, 53.5% indicated that they process their fish (cleaning, filleting, descaling) in the market. 49.5%

indicated that neither did they dispose of the fish wastes, recycled, throw in dumpsite, throw away nor contain in waste bins. Wekell *et al.*, (1994) noted that inadequate methods of handling, hygiene, sanitation and distribution may provide ideal conditions for pathogens to proliferate and reach infective levels. This emphasizes the need to put in place effective measures for the disposal of fish wastes after fish processing, since the current procedure is wanting, and basic handling practices and equipment are lacking.

Only 36.5% of the respondents indicated that a likely reason for the fish contamination as due to overstaying, 57.5% indicated that they did not have controlled dumpsite in the market, 72.5% indicated that they used uncontrolled dumpsite to dispose their packaging material and excess ice. Various outbreaks of food-borne illnesses, among which fish has been implicated as one of the vehicles, in various countries, in the past years have led to strict food quality/safety rules and regulatory system worldwide (Huss,1995). It is therefore imperative that fish operators observe GHPs in the markets.

Hygiene, cleanliness and consistent Good Handling Practices (GHPs) are critical components in environmental management of fish handling establishments. Results of the study indicated that 52.5% of the respondents had a food handler's medical certificate, 51% indicated that they did not wear food hygiene protective gear such as boots, 67% indicated that they wore food hygiene protective gear such as aprons, 83% indicated that they did not wear food hygiene protective gear such as gloves. 68.5% indicated that the operators in the market participated in environmental management activities though only 12% indicated regular participation. Environmental management of fish markets is crucial, otherwise more sensory quality loss would be anticipated in fish from local markets due to unhygienic conditions and poor handling that necessitates increased bacterial loading (Diei-Ouadi and Mgawe, 2011).

Table 4.1: Fish operator's fish handling practices

Attribute	Practice Response	Frequency	Percentage
State of fish preservation	In adequate ice	69	34.5
	Not adequate ice	58	29
	Fresh Non iced	55	27.5
	Smoked/Dried	18	9
Water use	No water	42	21
	Non piped	108	54
	Piped	50	25
Use of waste bins	No	127	63.5
	Yes	73	36.5
Processing fish i.e. filleting	No	107	53.5
	Yes	93	46.5
Disposal of process waste	Recycling	9	9.7
	Dumpsite	18	19.3
	Throw away	35	37.6
	Contain in bins	31	33.4
Possible reason for the fish	From Source	42	21

contamination	At the market	24	12
	Overstaying	73	36.5
	Other reasons	61	30.5
Controlled dumpsite in this market	No	115	57.5
	Yes	85	42.5
Disposal of packaging wastes	Uncontrolled dumpsite	145	72.5
	Throw away	52	26
	Waste bins	3	1.5
Food handlers' medical certificate	No	105	52.5
	Yes	95	47.5
Wear protective gear - boots	No	102	51
	Yes	98	49
Wear protective gear - aprons	No	66	33
	Yes	134	67
Wear protective gear - gloves	No	166	83
	Yes	34	17
Participation in environmental management activities	No	137	68.5
	Yes	63	31.5
How regular the operator's in the market participate clean ups	No Response	134	67
	Never	3	1.5
	Rarely	39	19.5
	Frequent	24	12

4.1.2 Fish traders' Perceptions on Environmental Management

Another objective of the study was to assess the perception of fish operators on the environmental management in the market.

Table 4.2 shows that the characteristic wastes in the market emanating from fish trade activities are solid fish wastes (fish frames, scales, offals), baskets, and packaging plastic bags.

Table 4.2 Fish trade waste characteristics

Characteristic	Frequency	Percent
Spoilt/bad fish	16	8
Baskets	18	9
Fish frames	47	23.5
Fish scales	54	27
Fish bones	11	5.5
Offals	6	3
Plastic Packaging materials	48	24

The researcher personally observed that the packaging materials and baskets were occasionally re-used though some of the fish operators disposed off the excess packaging materials just

adjacent to their working area. Fish scales constituted 27%, offals 3%, fish frames 23.5% and fish bones 5.5% of the by- products of fish processing in the market which are the key contributors to blocking of drains and dirtying the working surfaces. Packaging materials and basket constituted another 24% and18% respectively. In situations where cleanliness of the drains and working surfaces is not effective, there is potential for cross contamination especially from fish contact surfaces, equipment and fish handling operators. There is therefore need for conscious on adequacy of preventive measures like personal hygiene, sanitation, fish handling equipment and facilities (Jacxsens *et al*., 2010).

Table 4.3 shows that only 34.5% of the respondents indicated that the state of the environment in the market was good, while 38.5% indicated that packaging material affected the environment they worked in to a large extent.

A study proportion of 60.5% indicated that the amount of waste generated was significant to interfere with the adjacent environment while 59.5% indicated that amount of waste generated was significant to warrant being recycled or some other management strategy. This implies that the Fisheries department and the other environmental management institutions could encourage firms to invest in recycling of fish wastes into usable products such as animal feeds and compost manure/ fertilizers.

The researcher observed that there are two establishments who sun- dry fish skins to be used for recycling. The government should also give incentives to such ventures who utilize the fish wastes from the market to encourage them. Up scaling of recycling practices could also create gainful employment. The overall gain would avert poor hygiene, dirty environment because of poorly disposed fish wastes.

The result revealed that the concerns such as hygienic handling practices, wholesomeness, fish waste disposal, and smell and preservation concern were of great importance in regard to fresh fish and processed fish products traded. Amongst the respondents, 63.5% of the respondents indicated that hygienic handling of fish products traded was a very important concern of the market community. Fish freshness, safety to eat, and the state of preservation is also a major concern of the community operating here as regards the fish and fish products traded.

At least 49% of the respondents were of the opinion that disposal of fish wastes was important which indicates an average perception. This may also imply that the operators are not aware about the negative environmental effects of the fish wastes. However, 66.5% of the respondents agreed that a bad environmental situation in the market would influence the fish trade activities negatively, while 66.3% agreed that the unsellable fish and other fish wastes could be utilized as animal feed, compost manure and fertilizers. Sixty-six percent (66%) of the respondents agreed that recycling fish wastes would improve the environmental (sanitary) situation of the market. Only 43.5% rated as significant, the environmental effects caused by the fish trade as compared to other economic activities e.g. sale of old clothes (*mituba*), carpentry and groceries the environmental situation while 30.5% indicated that the fish operators' personal practices were excellent.

Table 4.3: Fish traders Perceptions on environmental management in the market

Attribute	Perception response	Frequency	Percent
Judgment on the state of environment in this market	Not aware	28	14
	Very poor	15	7.5
	Poor	42	21
	Fair	46	23
	Good	69	34.5
Wastes affecting the working environment to a great extent	Packaging material	77	38.5
	Fish frames	69	34.5
	Viscera and offal	27	13.5
	Water effluents	27	13.5
If amount of waste is significant to affect environment.	No	79	39.5
	Yes	121	60.5
If amount of waste is significant to be recycled or re used	No	81	40.5
	Yes	119	59.5
If hygienic handling of fish products is a major concern.	Not important	8	4
	Important	65	32.5
	Very important	127	63.5
If the fish freshness and safety to eat the major concern	Not important	95	47.5
	Important	65	32.5
	Very important	127	63.5
If the fish smell the major concern	Not important	104	52
	Important	21	10.5
	Very important	75	37.5
If the disposal of fish wastes the major concern	Not important	100	51
	Important	21	9.5
	Very important	75	37.5
If the preservation of fish state, the major Concern.	Not important	47	23.5
	Important	100	50
	Very important	53	26.5
If environmental status Influences fish trade negatively.	No	67	33.5
	Yes	133	66.5
If the unsellable fish and fish wastes can be utilized.	No	73	36.5
	Yes	127	63.5
Utilization of fish wastes	Animal feeds	69	34.5
	Compost manure	40	20
	Fertilizers	18	9
	No	73	36.5
If recycling fish wastes improve the environmental (sanitary) situation	No	68	34
	Yes	132	66

fish trade Vs. other trade activities	Not aware	56	28
	Insignificant	57	28.5
	Significant	87	43.5

4.1.3 Fish Trader's Level of Awareness on Institutional Guidelines

Table 4.3 shows that 54% indicated that they were aware of project(s) in the recent past that had attempted to address/improve the status of the environmental in the market. The researcher observed that there was a project by Fisheries Department to provide fish traders dealing with dry fish with shades and display racks. The fish operators indicated that they were aware of NEMA, Fisheries, and NCC Public health guidelines on food handling and sanitation (76%) while and a proportion of 64.5% indicated that NEMA, Fisheries, and NCC Public health government institutions were doing enough in environmental management and that they were satisfied with the services offered.

Further, 42% of the respondents indicated that the extension services or expected services of NEMA were not there. This could be explained that NEMA as a regulatory agency relies on other governmental institutions as lead agencies. Out of all the respondents, 55.5% indicated that the extension services or expected services of the Fisheries Department was frequent, 31.5% indicated the same for NCC Public Health Department. 51% of the traders indicated that they were aware of Government guidelines on importance of availability of water in fish handling premises. 70% were aware of Government guidelines on the importance of personal hygiene in fish handling premises and 55.5% of the traders indicated awareness that recycling of fish wastes can improve the sanitary situation in the market.

Table 4.4: Fish traders Level of Awareness on Institutions

Awareness attribute	Awareness level	Frequency	Percent
Aware of government initiatives to improve the environmental situation	No	92	46
	Yes	108	54
Aware of NEMA, Fisheries, and NCC Public health guidelines	No	48	24
	Yes	152	76
Satisfied with the government institutions in management	No	71	35.5
	Yes	129	64.5
Extension services from NEMA	Not there	84	42
	Occasional	57	28.5
	Not frequent	29	14.5
	Frequent	30	15
Extension services from Fisheries Department	Occasional	54	27
	Not frequent	20	10
	Frequent	111	55.5
	Frequent	15	7.5
Extension services from NCC.	Not there	8	4

	Occasional	57	28.5
	Not frequent	53	26.5
	Frequent	63	31.5
	V. Frequent	19	9.5
Guidelines on availability of water.	No	98	49
	Yes	102	51
Guidelines on personal hygiene in fish handling premises.	No	60	30
	Yes	140	70
Recycling of fish wastes can improve the sanitary conditions.	No	89	44.5
	Yes	111	55.5

4.1.4 Environmental Situation of the Market

According to the Public Health Act (Cap 242) section 118(n), any trade premises must be kept in a clean state and free from offensive smells arising from any drain, privy, watercloset, or not ventilated so as to destroy or render harmless and inoffensive as far as practicable any gases, vapours, dust or other impurities generated. This almost sums up the expected environmental situation in fish handling premises.

In fish markets, the scales and fats clog and block the drainage screens that results into additional cost in labour to mechanically scoop off these scales and fats. The scales are semi-recalcitrant and take long to decompose once dumped on the ground. Fish frames, filleting cut offs, fish bones and packaging materials interferes with the facilities, infrastructure and the general state of environment, in the market. The knowledge, handling and management of all these different fish wastes would to a great extent determine the environmental situation in the market.

The state of the working surfaces (tables, slabs), wastes drains, and congestion (adequate space) were the parameters used to measure the dependent variable; environmental situation.

Rating was on a symmetric Likert- type scale where the respondents specified their level of agreement or disagreement on state of the parameters (Table 4.5). The responses were then summed and averaged to create a score for the group of items, as discussed in the methodology, to rate if the environmental situation was good or not good. (Table 4.6). **Table 4.5 Environmental Situation of the market (Initial scores)**

Situation	**Response**	**Frequency**	**Percent**
Working surfaces (tables/slabs)	Very poor	24	12
Free of fish scales, fish frames, oils or other exposed fish wastes?	Poor	66	33
	Fair	40	20
	Good	52	26
	Excellent	18	9

Drainage. *Free of fish scales, fish frames, cut offs, stagnant effluent waters or other exposed fish wastes?*	Very poor	15	7.5
	Poor	69	34.5
	Fair	60	30
	Good	56	28
	Excell ent	0	0
Working space (congested) *If limited and congested by packaging baskets, exposed fish frames, odours ?*	Very poor	52	26
	Poor	60	30
	Fair	26	13
	Good	46	23
	Excell ent	16	8

Table 4.6 Environmental Situation category (Final computed scores)

Category	Score	Percent
Good- environmental situation	1	52.3
Not good –environmental situation	0	47.7

4.2 Influence of Awareness on Environmental Situation

Table 4.7 shows a summary of the Chi square results on awareness against the environmental situation. Results on awareness of Governmental institutions (NEMA, Fisheries, and NCC Public health) guidelines on food handling, confirmed a statistically significant association with environmental situation supported by (χ^2, =11.735, P= 0.001).

Rating the extension services or expected services of the governmental institutions indicated a significant relationship with the environmental situation, NEMA (χ^2 = 44.633, P=0.005), Fisheries Department (χ^2, = 69.906, P=0.008), NCC Public Health Department, (χ^2, = 52.119, P= 0.003).Chi square results on awareness of Government guidelines on importance of availability of water in fish handling premises confirmed significant relationship with environmental situation (χ^2, = 24.828, P= 0.011).

Traders awareness on fish wastes recycling strategy to improve the sanitary situation in the market, confirmed an association with environmental situation, supported by (χ^2 = 19.262, P= 0.000).

Table 4.7 Summary of Chi square results on influence of awareness.

Awareness-attributes	χ^2	P-value
Government institutions on food health. rrrrrrrrerguidelines	11.735	0.001
Rating extension services (Fisheries)	44.633	0.008

Rating extension services (NEMA)	69.906	0.005
Rating extension services (NCC)	52.119	0.003
Availability of water guidelines	24.828	0.011
Recycling of fish wastes	19.262	0.000

4.2.1 Regression for level of awareness against environmental situation

Logistic regression for level of awareness indicated that the quality of extension services by the Fisheries Department was positively and statistically associated with the environmental situation (P=0.003). The odds of being associated with good environmental situation were 4.903 higher for those who had a higher rating of the NEMA institution as compared to those who rated it otherwise. The quality of extension services by NEMA was significant (P= 0.000) while the services from NCC was also significant (P= 0.015). Awareness on the fact that "recycling of fish wastes can improve the sanitary situation in the market" was negatively and statistically associated with environmental situation (P= 0.004). The odds of being associated with good environmental situation were 0.312 higher for those agreeing on need to recycling as compared to those who disagreed. The model explained 68.7% (Nagelkerke R^2) of the variance in the variables. Overall at 0.05 level of significance, the results showed that the environmental situation is influenced by awareness. This supports the hypothesis that awareness on institutional guidelines is significantly related to the market's environmental situation (P<0.05).

The results imply that increasing awareness on the extension services from Government institutions, and increasing awareness on the need to recycle fish wastes could contribute to an improved the environmental situation of the fish market.

5.0 CONCLUSIONS AND RECOMMENDATIONS 5.1 Conclusions

The study concludes that fish trade activities influenced the status of the environment. The trader's fish handling practices; their perceptions on environmental management and the level of awareness on institutional hygiene guidelines are factors that proofed a statistically significant effect on the environmental situation in Gikomba fish market, Nairobi. The study also concludes that improving on the identified key attributes would result in an improved environmental situation.

5.2 Recommendations

The Department of Fisheries should review the modalities on fish handling throughout the fish marketing chain. Emphasis should be given to provision of water, use of ice, proper disposal and re-use of fish wastes and cleanups in the fish markets.

Sensitizing fish traders and enforcement of basic environmental requirements on maintenance of drainage systems, use of protective clothing, confining the market to fish trade activities only and minimizing wastes generation.

The Government should draft programs that will educate fish traders on the existing sanitary regulations. In addition, institutional strengthening programs which facilitate training opportunities for Government agencies staff operating in the fish market should be established.

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