

## APPRAISAL OF ENVIRONMENTAL SANITATION PRACTICES IN SELECTED MARKETS IN AKURE, NIGERIA

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**Abstract:** This study examines environmental sanitation practices of the users in the selected markets in Akure Ondo State, Nigeria. It assesses the socio-economic characteristics of the market users, as well as the factors influencing environmental sanitation practices. The study also examined the relationship between socio-economic characteristics of respondents and environmental sanitation practices. Data were obtained from two purposively selected markets. A traditional (Adedeji) and modern (Nepa) market. Random Systematic sampling techniques was used to administer a total of 151 structured questionnaires for the traders in the study area. Therefore, 57 questionnaires were administered in Adedeji market and 94 questionnaires were administered in Nepa neighborhood market, using the shop/stalls as the sampling units. Descriptive statistics and inferential statistics were used to analyze the data collected. The study revealed that most of the market users in Nepa (67.5%) and Adedeji (61.4%) market were females respectively. It was also revealed that some of the goods selling in the market includes; foodstuff, livestock, electronic, supermarket and textile products. This indicated that waste are generated on daily basis in both markets and collected on daily and weekly basis, where 95.4% of traders adopted waste collection services. Findings reveals that sanitation facilities were fairly (47.7%) provided. Cleaning of toilets, drainage, waste collection among others are the sanitation practices

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carried out mostly on weekly basis. With mean weighted value of (4.74), avoidance of penalty is the dominant factor influencing participation in the sanitation exercise. Result of Correlation analysis revealed that there is low positive correlation ( $r = 0.142$ ,  $p = 0.084$ ) between socio-economic characteristics of respondents and sanitation practices in the two markets. The study concludes by recommending among others that market management and government should be actively involved in the provision of sanitation facilities in the markets to enhance proper hygiene.

**Key words:** environment, sanitation, practice, traditional market, modern market.

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## INTRODUCTION

Environmental sanitation has remained an intractable problem in the developing nations particularly Nigeria with serious public health consequences. This is due to poor sanitation practice as a result of improper refuse disposal, inadequate water supply and gross inadequacy of sanitary facilities especially in the market areas (Ministry of Health, 2011). Generally, markets occupy an important position in the lives of Nigerians and activities involved in buying and selling generate large quantities of solid waste that contains a large proportion of decomposing vegetable and animal matter (Parks, 2007). Ogwueleka added that market centres do not only serve as places for commodity exchange but also centres of information exchange, local administration, health delivery, education, and entertainment centre, etc. where buying and selling are carried out among others (Ogwueleka, 2009).

These activities generate large quantities of solid waste which cause unpleasant odor, excellent breeding grounds for vectors of communicable diseases including rodents and insects, and also being eyesores which all have direct unpleasant environmental consequences (Ministry of Health, 2011). It is quite common to observe mountains of refuse at market places this heaps of refuse provide excellent breeding grounds for vectors of communicable diseases including rodents, insects, etc. which increases the potential for the spread of infectious diseases (Ayoola, Lawal, & Akinluyi, 2012).

It has been acknowledged that many of the diseases that affect Nigerians such as malaria, tuberculosis and diarrhea are direct effect of poor sanitation and are due to unhealthy environmental conditions which most times are resultant of contaminated food stuffs (National Population Commission, 2004). Thus, poor environmental and sanitary conditions at market centres in the country portend adverse public health implications for and market users.

The term 'environmental sanitation' has been given various definitions by different authors and researchers in different countries and times (Ayoola, Lawal, & Akinluyi, 2012; Ilesanmi, 2009). Environmental sanitation refers to the state of cleanliness of a place, community or people particularly relating to those aspects of human health including the quality of life determined by physical, biological, social and psychological factors in the environment (Acheampong, 2010; Godfred & Ruby, 2019; Fagbemi, Ogungbemi, Philips, Obatuase, & Hassan, 2020). Meanwhile, it also involves the interventions to reduce people's exposure to diseases by providing a clean environment to live and with measures to break the cycle of disease emanating from untidy surroundings (Abejegah, et al., 2013).

Environmental sanitation is a concept explaining activities to ensure safe disposal of excreta, solid waste and other liquid waste and the prevention of disease vectors to ensure a hygienic environment (Acheampong, 2010); which also involves both behaviors and facilities which work together to form a hygienic environment (WHO, 2004). Furthermore, environmental sanitation generally encompasses all conditions that affect health which includes water, wastewater, personal and food hygiene, public health etc.

Hence, activities carried out in public places like markets and other public places of insanitary conditions pose adverse health hazards to the operators in these activity centres (Arthur & Imoro, 2021; Olutegbe & Asubiojo, 2020; Ivan, 2019). This study therefore assesses the existing environmental sanitation practices of markets users in selected markets in Akure, Ondo State, Nigeria.

## MATERIALS AND METHODS

### The Study Area

Akure is a city in south-western Nigeria and is the largest and the capital city of Ondo state. It is located in the South Western Zone of Nigeria. It is geographically located within Latitudes 70°15'N and 70°28'N North of the Equator and Longitudes 5°06'E and 50°21'E East of the Greenwich Meridian. The increased relative political influence of Akure as a state capital since 1976 has greatly promoted its rapid growth and increased socio-economic activities resulting in its spatial expansion from an area of about 16 squares kilometers in 1980 to about 30 square kilometers in 2000 (Fagbemi, Ogungbemi, Philips, Obatuase, & Hassan, 2020). As a capital city of Ondo state it is a medium-sized urban centre which has three residential settlement patterns the core area, the peripheral neighborhoods to the core and the suburbs. Akure town which is mainly embedded in Akure South Local Government Area has witnessed immense growth in the size of built-up areas, number of immigrants, transportation, and commercial activities and has attracted both major investors and private developers into the city. The last census conducted in 2006 put the town's population at 353,211 i.e. Three hundred and fifty-three thousand, two hundred and eleven (National Population Commission, 2004).

### Methods of Data Collection and Analysis

The sample frame for this study comprises of the shop/stall users in Nepa neighborhood market and Adedeji traditional market in Akure. First, the sample size was drawn from two (2) selected markets which are Nepa neighborhood market and Adedeji traditional market in Akure. These were selected by purposive sampling methods. In the market there is identification of lock-up stalls, open stalls and open space. The next stage involves the administration of questionnaire for traders in the selected shops and stalls. Random Systematic Sampling technique was adopted in selecting every 3rd respondent from the lock/open stalls and open space. Using this procedure, a total of 151 questionnaire were administered in the two markets. The data collected were analyzed using descriptive and inferential statistics. For Descriptive statistics, cross tabulation with chi-square was used to examine socio-economic characteristics of market users; environmental sanitation facilities and practices of market users as well as factors influencing market sanitation practices. For inferential statistics, Spearman rank correlation analysis was used to examine relationship between socio-economic characteristics and environmental sanitation practices.

## RESEARCH FINDINGS

### Socio-Economic Characteristics of Traders

Under this sub-section of the study, attempt is made to examine the socio-economic characteristics of respondents, in this case the market users in Adedeji and Nepa neighborhood market. The knowledge of the socio-economic characteristics of developers will no doubt sharpen our understanding of how they are being enlightened when it comes to the issue of market environmental sanitation practices.

**Table 1.** Socio-Economic Characteristics of Traders  
(Source: Authors' fieldwork, 2019)

Socio-economic variables	Percentage (%)	
	Adedeji Market	Nepa Market
<b>Gender</b>		
Male	20.0	12.5
Female	45.3	22.2
<b>Age</b>		
18-30 years	15.6	84.4
31-40 years	46.3	53.7
41-50 years	48.8	51.2
51-60 years	21.4	78.6
61 years & above	40.0	60.0

<b>Marital status</b>		
Single	29.2	70.8
Married	40.7	59.3
Widowed	0.0	100
<b>Occupation</b>		
Trading	23.9	76.1
Self-employed	48.1	51.9
Civil servant	0	100
Artisan	68.4	31.6
Retired	50.0	50.0
<b>Income</b>		
N18,000 & below	37.2	62.8
N18,000-N40,000	39.5	60.5
N41,000-N60,000	35.0	65.0
&N61,000 & above	0	100
<b>Education</b>		
No formal education	70.6	29.4
Primary education	37.5	62.5
Secondary education	39.4	60.6
Tertiary education	22.7	77.3

The gender of respondents as obtained and presented in table1 revealed that most of the respondents (67.5%) are female in both market compared to male (32.5%) respondents. The bulk of the respondents interviewed were between the ages 31-40 years and 41-50 years. It is clearly expressed that most respondents are married. Expectedly, trading is the dominant occupation, where respondent in the Nepa market earns more on monthly basis compared to respondents in Adedeji market. The highest proportion (77.3%) of respondents in Nepa market have tertiary education, while most of the respondents (70.6%) in Adedeji market have no formal education.

The nature of goods sold sometimes determines the level of sanitation in a market. As shown in Table 2, foodstuff, livestock, electronic, supermarket and textile products which generate large quantity of waste were sold by the market users. It was indicated that 33.1% are of foodstuff, 17.8% of livestock, 13.9% operates supermarket, 8.6% engaged in restaurant, 7.9% sells snacks, 6.6% stationery, 3.9% textiles/boutique, 3.3% sells plastics and electronics while 1.3% sells vehicular part in both markets. In Nepa market 35.1% sell foodstuff and 14.9% sells livestock and supermarket, 10.6% rated for restaurant while 7.4% and 5.3% accounted for snacks and stationery and 3.2% accounted for electronics, plastics and textiles respectively. Respondent in Adedeji market also sells foodstuffs (29.8%), livestock (22.8%), operates supermarket (12.2%), snacks and stationery (8.7%), restaurant and textile/boutique (5.2%), electronics and plastics (3.5%) respectively.

### Environmental Sanitation Practices of Market Traders

The list of method of waste disposal and the ones adopted by the market users is contained in table3. It can be deduced that 95.4% adopted waste collection service method, 2.6% adopted nearby bush while 0.7% adopted open space dumping. Burning designated dump site, inside drainage, nearby bush, barrow or cart pusher and nearby bush are not adopted by the market users in both market respectively.

**Table 2.** Types of Goods being sold in the Markets  
(Source: Authors' fieldwork, 2018)

Name of Market	Activities and Types of Goods Sold										Total
	Livestock	Foodstuffs	Electronics	Super market	Snacks	Plastics	Stationery	Restaurant	Vehicular Part	Textiles/ Boutique	
Nepa F	14	33	3	14	7	3	5	10	2	3	94
%	14.9	35.1	3.2	14.9	7.4	3.2	5.3	10.6	2.1	3.2	100

Adedeji F	13	17	2	7	5	2	5	3	0	3	57
%	22.8	29.8	3.5	12.2	8.7	3.5	8.7	5.2	0.0	5.2	100
Total F	27	50	5	21	12	5	10	13	2	6	151
%	17.8	33.1	3.3	13.9	7.9	3.3	6.6	8.6	1.3	3.9	100

**Table 3.** Method of Waste Disposal

(Source: Authors' fieldwork, 2019)

Name of Market	Nearby Bush		Burning	Designated Dumpsite	Open Space		Inside Drainage	Nearby stream	Barrow or Cart Pusher	Waste Collection Service	
	Yes	No			No	Yes				No	Yes
Nepa F	4	90	94	94	1	93	94	94	94	88	6
% of Rows	4.3	95.7	100	100	1.1	98.9	100	100	100	93.6	100
% of Column	100	61.2	62.3	62.3	100	62.0	62.3	62.3	62.3	58.3	62.3
Adedji F	0	57	57	57	0	57	57	57	57	56	57
% of Rows	0.0	100	100	100	0.0	100	100	100	100	98.2	100
% of Column	0.0	38.8	37.7	37.7	0.0	38.0	37.7	37.7	37.7	38.9	37.7
Total F	4	147	151	151	1	150	151	151	151	144	151
% of Rows	2.6	97.4	100	100	0.7	99.3	100	100	100	95.4	100
% of Column	100	100	100	100	100	100	100	100	100	100	100

**Table 4.** Sources of Water Supply in the Market

(Source: Authors' fieldwork, 2019)

Name of Market	Sources of water supply				Total
	Tap Water	Borehole	Well Water	Water Vendor	
Nepa F	45	34	15	0	94
% of Rows	47.9	36.2	16.0	0.0	100
% of Column	93.8	94.4	22.7	0.0	62.3
Adedeji F	3	2	51	1	57
% of Rows	5.3	3.5	89.5	1.8	100
% of Column	6.3	5.6	77.3	100	37.7
Total F	48	36	66	1	151
% of Rows	31.8	28.8	43.7	0.7	100
% of Column	100	100	100	100	100

The sources of water supply to the market varies according to the respondents in both markets as shown in Table 4. The study reveals that water is supplied to the Nepa markets through Tap water point and bore hole while Adedeji market source water from well water respectively. Furthermore, 47.9.0% and 36.2% of respondent in Nepa market source water from Tap point and borehole respectively. While 89.5% and 5.3% of respondent in Adedeji market source water from Well Water as shown in Table 4. It can be inferred that, the well water in Adedeji market was provided by the residential houses within and around the market most especially the residential buildings that were converted for commercial use.

**Table 5.** Access to Toilet Facility

(Source: Authors' fieldwork, 2019)

Name of Market	Access to toilet facility		Total
	Yes	No	
Nepa F	81	12	93
% of Rows	87.1	12.9	100
% of Column	59.6	85.7	62.0
Adedeji F	55	2	57
% of Rows	96.5	3.5	100
% of Column	40.4	14.2	38

Total F	136	14	150
% of Rows	90.7	9.3	100
% of Column	100	100	100

Toilet facility provides a means of disposing human waste of excreta and urine. It is therefore an essential environmental sanitation facility. From the analysis as shown in Table 5, it is observed that 87.1% of the respondent in Nepa market have access to toilet facilities owned and managed by the government while in Adedeji market 96.5% of the respondents acknowledge that they also have access to toilet facilities. Although the toilets are owned and managed by individuals whereby you pay #20 to urinate and #30 to excrete. Hence, in both markets there is provision of toilets.

**Table 6.** Adequacy of Toilet Facility

(Source: Authors' fieldwork, 2019)

Name of Market	Adequacy of toilet facility				Total
	Fully Adequate	Partially Adequate	Inadequate	Others	
Nepa F	32	43	7	11	93
% of Rows	34.4	46.2	7.5	11.8	100
% of Column	55.2	61.4	70.0	91.7	62.0
Adedeji F	26	27	3	1	57
% of Rows	45.6	47.4	5.3	1.8	100
% of Column	44.8	38.6	30.0	8.3	38.0
Total F	58	70	10	12	150
% of Rows	38.7	46.7	6.7	8.0	100
% of Column	100	100	100	100	100

The adequacy of toilet facility in the selected market as rated by the respondent as presented in Table 6, the respondent revealed that 46.7% is partially adequate, 38.7% is fully adequate, and 6.7% is inadequate. The study further accounted that 46.2% of the respondent in Nepa market rated the provision of toilet facilities as partially adequate, 34.4% rated it adequate. While in Adedeji market 47.4% of the respondent rated the toilet facilities partially adequate and 45.6% adequate respectively. Therefore, the analysis reveals that these facilities are relatively partially adequate.

**Table 7.** Frequency of Toilet and Drainage Cleaning

(Source: Authors' fieldwork, 2019)

Name of Market	Basis of Drainage Cleaning			Total
	Daily	Weekly	Monthly	
Nepa F	60	28	3	91
% of Rows	65.9	30.8	3.3	100
% of Column	53.6	87.5	75.0	61.5
Adedeji F	52	4	1	57
% of Rows	91.2	7.0	1.8	100
% of Column	46.4	12.5	25.0	38.5
Total F	112	32	4	148
% of Rows	75.7	21.6	2.7	100
% of Column	100	100	100	100

Concerning frequency of toilet and drainage cleaning, it can be inferred that the drains are kept clean on daily basis. 65.9% and 91.2% of respondent in Nepa and Adedeji market respectively reveals that the drains are cleaned on daily basis, as presented Table 7.

Frequency of environmental sanitation exercise is presented in Table 8 indicated that 96.7% of the total respondents says that the environmental sanitation exercise in the selected markets are on weekly basis, specifically every Thursday of the week to be precise within the hours of 7AM and 10AM. Hence, this environmental sanitation exercise is on weekly basis in both markets.

**Table 8.** Frequency of environmental sanitation exercise  
(Source: Authors' fieldwork, 2019)

Name of Market	If yes, when			Total
	Weekly	Fortnight	Monthly	
Nepa F	89	1	4	94
% of Rows	94.7	1.1	4.3	100
% of Column	61.0	100	100	62.3
Adedeji F	57	0	0	57
% of Rows	100	0.0	0.0	100
% of Column	39.0	0.0	0.0	37.7
Total F	146	1	4	151
% of Rows	96.7	0.7	2.6	100
% of Column	100	100	100	100

**Table 9.** Perception about Cleanliness of the Market  
(Source: Authors' fieldwork, 2019)

Name of Market	Perception about market cleanliness			Total
	Very Clean	Clean	Fairly Clean	
Nepa F	45	47	2	94
% of Rows	47.9	50.0	2.1	100
% of Column	95.7	50.0	20.0	62.3
Adedeji F	2	47	8	57
% of Rows	3.5	82.5	14.0	100
% of Column	4.3	50	80.0	37.7
Total F	47	94	10	151
% of Rows	31.1	62.3	6.6	100
% of Column	100	100	100	100

The analysis on the perceived effectiveness of sanitation exercise in the market is presented in Table 9 shows that 50.0% and 47.9% of the respondents in Nepa market rated the effectiveness of environmental sanitation exercise as clean and very clean respectively. In Adedeji market the respondent also rated 82.5% and 14.0% clean and fairly clean respectively.

**Table 10.** Rating of Efficient Decency of Environmental Sanitation Practice in the Markets  
(Source: Authors' fieldwork, 2019)

Name of market		Nepa market		Adedeji market	
Components	Responses	F (94)	%	F (57)	%
Provision of waste disposal facilities	Very effective	46	48.9	48	84.2
	Effective	40	42.6	7	12.3
	Fairly effective	7	7.4	2	3.5
	Not effective	1	1.1	0	0.0
Regular provision of portable and safe water supply	Very effective	1	1.1	0	0.0
	Effective	4	4.3	9	15.8
	Fairly effective	23	24.5	13	22.8
	Not effective	36	38.3	35	61.4
Provision of adequate number of toilet	Not at all effective	30	31.9	0	0.0
	Very effective	3	3.2	2	3.5
	Effective	0	0.0	8	14.0
	Fairly effective	23	24.5	9	15.8
Quality of toilet provided	Not effective	34	36.2	37	64.9
	Not at all effective	34	36.2	1	1.8
	Very effective	1	1.1	0	0.0
	Effective	5	5.3	6	10.5
	Fairly effective	24	25.5	11	19.3

	Not effective	30	31.9	39	68.4
	Not at all effective	34	36.2	1	1.8
Provision of drains for storm water	Very effective	16	17.0	2	3.5
	Effective	44	46.8	4	7.0
	Fairly effective	23	24.5	11	19.3
	Not effective	11	11.7	37	64.9
	Not at all effective	0	0.0	3	5.3
Enforcement of sanitation policy	Very effective	72	76.6	42	73.7
	Effective	17	18.1	10	17.5
	Fairly effective	3	3.2	5	8.8
	Not effective	2	2.1	0	0.0
	Not at all effective	2	2.1	0	0.0

The determinant of effective environmental sanitation practice are based on the presence of adequate facilities and conditions which are said to be important in rating sanitation exercise and its practice within the selected markets. As shown in Table 10. In Nepa and Adedeji market 48.9% and 84.2 % of the respondent rated the provision of waste disposal facilities as an effective of aid efficient sanitation. Efficient sanitation can be achieved in the market area through provision of sanitation facilities such as water, drainage, waste disposal facilities, provision of information on environmental sanitation and enforcement of sanitation policy. These were considered and the respondent's perception about how these can aid efficient environmental sanitation was researched.

The determinant of effective environmental sanitation practice are based on the presence of adequate facilities and conditions which are said to be important in rating sanitation exercise and its practice within the selected markets. As shown in Table 10. In Nepa and Adedeji market 76.6% and 73.7% of the respondent rated the enforcement of sanitation policy as effective component while 24.5% and 19.3% of the respondents rated provision of drainage as effective component that aids market sanitation. 61.4% of respondents in Adedeji market stated that regular provision of water is not at all effective while in Nepa 38.3% respectively. Provision of toilet was rated not effective at 36.2% and 64.9% in both markets.

The respondents in both market also rates as relatively effective enforcement of sanitation policy in the markets.

### Factors Influencing Sanitation Practices

It is observed in table 11 that avoidance of sanitation penalty has the highest mean weighted value of 4.74. This implies that avoidance of sanitation penalty is highest factor influencing market environmental sanitation practices in Nepa and Adedeji market. This situation is followed in decreasing order by market sanitation policy which has mean weighted value of 3.45, availability of sanitation facilities (3.92); health purpose/ hygiene (4.11); constant sanitation schedule (4.56).

**Table 11.** Factors Influencing Sanitation Practices  
(Source: Authors' fieldwork, 2019)

S/N	Factors	Ranking					NRF	FWV	MWV	Rank
		5	4	3	2	1				
1	Market Sanitation Policy	495	192	12	0	0	151	526	3.48	5 <sup>th</sup>
2	Availability of Sanitation Facilities	190	288	96	18	0	151	592	3.92	4 <sup>th</sup>
3	Constant Sanitation Schedule	480	192	12	4	1	151	689	4.56	2 <sup>nd</sup>
4	Health Purpose/ Hygiene	250	288	78	6	0	151	622	4.11	3 <sup>rd</sup>
5	Avoidance of Sanitation Penalty	600	104	9	4	0	151	717	4.74	1 <sup>st</sup>
	Total								20.81	

Specifically, it could be observed however, that none of the responses of market users on each of the factor were below average in their opinion on the environmental sanitation practices



within the market. Nevertheless, the overall mean value of responses of factors influencing market sanitation, as obtained from the users is 4.162. This implies that mean responses of the people were far more above average indicating that the factors were highly functional in the study area. This situation is very good because certain factors are meant to influence people to engage in market sanitation.

### **Relationship between Socio-Economic Characteristics of Respondent and Sanitation Practices**

To examine the relationship between socio-economic characteristics of respondent and sanitation practices in the study area, Spearman Rank Correlation Analysis was used. Four (4) variables were identified and used as socio-economic characteristics. They are: gender, age, marital status, highest level of education. It could be noted, however, that four (4) variables were also identified for sanitation practices. These variables are: method of waste disposal, participation of sanitation exercise, component that aid sanitation practice, punishment accorded to those that does not participate in sanitation exercise.

To make these variables suitable for correlation analysis, they have to be summarized into one composite variable through the use of average computation. This was done and variable of socio-economic characteristics of respondent and sanitation practices were statistically obtained. They were thereby correlated and the result is contained in table 12.

**Table 12.** Correlation Analysis between socio-economic characteristics of respondent and sanitation practices  
(Source: Author's Computation, 2019)

<b>Correlation</b>		<b>Socio-economic characteristics</b>	<b>Sanitation practices</b>
<b>Socio-economic characteristics</b>	Spearman rank correlation (rs)	1.000	0.142
	Sig. (2-taile) p-value	-	0.084
	N	150	150
<b>Sanitation practices</b>	Spearman rank correlation (rs)	0.142	1.000
	Sig. (2-taile) p-value	0.084	-
	N	150	150

Table 12 shows the correlation analysis of relationship between socio-economic characteristics of respondent and sanitation in Nepa and Adedeji market. According to the table 4.37 with correlation coefficient of 0.142, it is observed that there is low positive correlation between socio-economic characteristics of market users (respondents) and sanitation practices in Nepa and Adedeji market. This implies that the socio-economic characteristics of the market users, no doubt have influence on the sanitation practices considerably. Moreover, with p-value of 0.084, it is also observed that there is no statistical significant relationship between socio-economic characteristics of market users and sanitation practices at  $p > 0.05$  confidence level in the sampled market. However, the observed relationship might be due to chance.

### **POLICY ISSUES AND CONCLUSION**

The study concluded that the level of environmental sanitation practice in the selected markets is high but the sanitation exercise is not convenient for the market users, due to inadequate sanitation facilities and services in the market. Inadequate sanitation facilities were a prime problem they encountered during sanitation exercise in the market thus adequate investment should be made in the provision of necessary sanitation facilities. The government alone cannot provide the needed sanitation facilities; private agency and market association should also be encouraged through incentives to provide such facilities such as toilet and urinal facilities.

Adequate Hygiene behavior and health promotion is crucial in preventing disease. Hence, improving infrastructure and facilities without a basic improvement in hygienic behaviour of market

users will rarely result in effective environmental sanitation practices. Therefore, hygiene education is integral to environmental sanitation. Hygiene education seeks to support sustainable behavior improvements through increased awareness and knowledge. It will influence the extent of the market sellers' adaptation to environmental sanitation regulations, policy issues, use of modern facilities and participation. Hygiene education should therefore be integrated into environmental sanitation planning for market.

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