Journal of Medicine and Medical Sciences Vol. 3(3) pp. 146-154, March, 2012
Available online@ http://www.interesjournals.org/JMMS

Full Length Research Paper

Health perception of indiscriminate waste disposal - A Ghanaian case study

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Accepted 19 January, 2012

Human excrement, garbage and wastewater are usually deposited in surface drains, open spaces and streams. This has resulted in poor sanitation and serious health implications. An analytical cross-sectional study design was used to examine the household and community knowledge, attitude and practices of waste disposal and its health implications in the Kintampo North District of Ghana. Of a total of 250 household heads interviewed, 176 (70.4%) were males, 74 (29.6%) were females, 134 (53.6%) were not educated, and 211 (84.4%) does not have toilets facilities in their homes. 38.3% of the families without toilet in their homes facilities practice open range defecation, while 61.3% rely on public latrine for their convenience. There was a strong association between type of occupation of household heads and ownership of a toilet [$\chi 2$ = 20.5, p value = 0.002]. Majority (82.8%) of households interviewed dispose their waste at refuse dumps and open gutters, 7.6% in the bush, while 0.8% burn them. 53.2% these households use children for their waste disposal 10% of whom were below 10 years of age. Though over 80% of the household heads knew of disease relationship with human faeces and indiscriminate refuge disposal, only 2.4% had an adequate knowledge of this problem, which has a strong association with the educational levels of the respondents [$\chi 2$ = 29.1, p value = 0.001]. Inadequate sanitation facilities has created severe environmental and sanitation problems such as indiscriminate dumping of waste, discharging of waste waters into the environment as well as open defecation. This poses major health hazards to the community especially to the mothers and their children. Poverty, inadequate waste disposal facilities, and the low level of environmental health awareness need to be addressed urgently.

Keywords: Health perception, waste disposal, Kintampo district.

INTRODUCTION

In developing countries, waste management has remained a major development issue mainly as a result of lack of understanding of the basic dynamic characteristics of waste generation, and appreciation of the origin of sanitation (Noye-Nortey, 2007). The rapid uncontrolled, unplanned urbanization in the developing nations of Africa has brought untoward ill effect of environmental degradation. Indeed, one of the most pressing concerns of urbanization in the developing world has been the problem of solid, liquid, and toxic-waste management. Recent events in major urban centres in Africa have shown problem of waste management to be a monster that has aborted efforts of both federal governments and many professionals (Onibokun et al., 1999). According to Lyse (2003) nine of every ten African Cities are facing serious waste problems.

The most common method of waste disposal in most developing countries is some form of land filling (WHO, 1973). The current environmental sanitation status of Ghana leaves much to be desired. Less than 40% of urban residents are served by a solid waste collection service, less than 30% have acceptable household toilet facility (Boadi et al., 2004), and only about 10% of solid wastes generated are properly disposed (Menah et al., 2005), with Rural dwellers less well served (Boadi et al., 2004). Landfills in Ghana are primarily open dumps

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without leachate or gas recovery systems, several are located at ecological or hydrologically sensitive areas, and are generally operated below the recommended standards of sanitary practice. Open refuse dumps are most commonly located at the perimeter of major urban centres in open lots, wetland areas, or next to surface water sources. In rural areas and small towns, there are often no vehicles for collection of waste, hence uncontrolled dumping occurs within the built up areas with all its attendant health hazards and negative environmental impact (Menah et al., 2005).

A visit to any African city today will reveal aspects of the waste-management problem such as heaps of uncontrolled garbage, roadsides littered with refuse, streams blocked with junk, disposal sites constituting a health hazard to residential areas, and inappropriately disposed toxic wastes (Onibokun et al., 1995). The resultant poor sanitation has serious health impacts as more than half of reported diseases are related to poor environmental sanitation (WHO, 1979). It is widely noted that the contribution and benefits of the environment to other determinants of health are not well understood by policy makers and planners. This is reflected in the low level of resources allocated for the maintenance of an enabling environment to support life and health (WHO, 2002). Waste, when not properly managed will directly or indirectly negatively affect the environment and health. The diseases that burden communities' particularly those from deprived rural and urban communities in Africa are mainly due to environmental conditions that can be avoided. In Africa, water-related diseases such as malaria, schistosomiasis and river blindness are some of the causes of high morbidity which impact negatively on the economy and the health sector. Infectious diseases linked to poor environmental conditions kill one out of every five children in Africa, with diarrhoea and acute respiratory infections being the two major killers (WHO,1998). Other water and sanitation related diseases include guinea worm, trachoma, cholera, hepatitis A, bilharzias, typhoid, malaria, polio, hookworm, and tapeworm (Boadi et al., 2005). Waste when indiscriminately dumped and allowed to accumulated will not only favour the spread of diseases, but also look unsightly and produces a lot of stench. It can harbour and encourage the breeding of rodents and disease causing organisms, causes pollution of both land and water, and lowers the image of the community. Certain factor such inadequate sanitary facilities, behavioural pattern of community members, socio-economic power of the community, political negligence etc, have been found to contribute to uncontrolled waste disposal.

This study therefore seeks to find the actual causes of uncontrolled waste disposal in the district, determine degree of human knowledge of health implication of indiscriminate wastes disposal, and thus providing baseline information on the waste disposal situation in the district. Recommendations would then be made to the authorities to aid in finding solution to the problem.

MATERIALS AND METHODS

The study was a descriptive study utilizing both quantitative and qualitative methods for data collection. A detailed structured questionnaire was used to collect information on household socio-demographic characteristics from household heads. The knowledge and practices of the households in relation to waste disposal was also assessed. The Focus group discussions using semi-structured questionnaires were used to assess communities' knowledge, practices and perceptions in relation to the uncontrolled waste disposal in the district and its health implication. The In-depth Interviews were used to collect information on individual views of the poor waste disposal issues and its ill-effect on health in the district.

The Kintampo North District is one of the 19 districts of the Brong Ahafo region of Ghana. For administrative convenience, the district was demarcated into 7 sub-districts. Kintampo sub district is located at the centre of Ghana, and a major transit point for many travellers, tourist and traders. The main indigenous ethnic groups are the Akans, Bonos and the Mos, while the major economic activity is small scale farming and trading. It has a District hospital, three clinics, four health centres, a maternity home, a rural health training school and a research centre.

The projected population size for household heads in 2006 in the Kintampo North District is 3155. Using 20.9% as the least factor variable under study from the study by Ebong in 1994, the worst acceptable result of 15.9% was used in Epi info to calculate the sample size. The sample size calculated was 235 at 95% confidence interval, but a sample size of 250 was used to make room for incomplete questionnaires and improve precision of the study.

A simple random sampling was employed in the population sampling of the household heads. The sample size of 250 was distributed among the communities in the 7 sub-district according to its population proportion in relation to entire population of the district by simple random sampling method. The listing of the household heads that were alive and living in Kintampo was generated from the Kintampo District Surveillance System (KDSS). The method ensured that each participant was chosen completely at random without introducing any form of bias. A household is defined as all the people living together in a house (Hornby, 2005). For the purpose of the study theoretical training was conducted for the data collectors.

Household survey was conducted with the detailed structured questionnaires. Household heads were interviewed to get information on their knowledge, attitudes and practices in relation to waste disposal in

their households.

Eleven focus group discussions were conducted for the community members in both the urban and rural areas in addition to the quantitative data to buttress the findings of the study. The Focus group discussions were used to assess communities' knowledge, practices and perceptions in relation to the uncontrolled waste disposal and its health perception in the district. The focus group discussions consisted of twelve participants at each session, which was moderated by two research personnel. The sessions were conducted in Twi language, a common language spoken in Ghana. Each discussion session lasted for about an hour and was recorded in a tape with the permission of the participants. The tapes were then transcribed and translated from Twi to English for a clear understanding of its contents. Coding of the transcript was done manually to identify consistent themes during the discussions. Those items that came up the most were considered the groups' main opinion. Results were written and presented in exemplar quotes so as to highlight salient results.

Data analysis was conducted using SPSS 12.O. The study was undertaken under the approval of the Ghana Health Service National Ethical Committee as well as the Kintampo Health Research Centre Ethical Committee. A written informed consent was obtained from the participants who were willing to take part in the study. No one was forced to take part in the study.

RESULTS

The socio-demographic and household characteristics of the household heads involved in the survey are presented in Table 1. Sex distribution of 250 household heads interviewed indicates more male (70.4%) than female (29.6%) with 29.6% being above 60 years. Majority 78.0% were married, 53.6% had no education, 55.2% were labourers/farmers, 18.4% were traders, 49.6% Christians, 62.8% came from Kintampo sub district of the study area, with Akans 22.0% as the ethnic groups.

Table 2 shows the type of toilet facilities in the households. Majority of households (84.4%) don't have toilet facilities in their homes, 15.6% with toilet facilities mentioned pit latrine (45.6%) as their type of toilet facility. This was almost similar from reports from the Focus group discussion where none of discussants reported having toilet in their houses. Reason(s) given being high cost of building a toilet and emptying it when full, the general believe that a person cannot stay in the same house with a toilet because of the odour, and the fact that the study area has a vast area of land were one can easily free him or herself in the bush.

Figure 1 and 2 shows where households without toilets defecate and reasons for using open defecation. Most 129 (61.3%) of the homes without toilet facility use community toilets, 81 (38.4%) practice open defecation, while negligible number (< 1%) use their neighbour's toilet. Similar response was also obtained from the discussants in Focus Group as exemplified by the following statements from female discussants: "I use the community toilet to defecate as we don't have a toilet in our house", another said "because the community toilets are so dirty and the hot air coming from it smells so bad, I prefer to go to my farm to defecate". This was the major view of most of the discussants. Most respondents who defecate in open places do that because they don't have toilet facility in the homes, some say because of convenience, while other say because of the dirtiness of the community latrine.

Table 3 shows household practices in relation to waste disposal. While children 53.2% were the main people responsible for waste disposing in the households interviewed 10.5% of the children were below the age of 10 years. The activities of the sanitary workers were highly insignificant as shown on the table where only 0.4% of sanitary were involved in waste disposal. This was also justified by the following statement from the discussants in the Focal Group; "I have never seen where sanitary worker(s) come to collect waste from our houses since I was born". Waste disposal in refuse dumps and open gutters was done by 82.8% of respondents, 8.8% dumps theirs at their backyard, 7.6% disposes in the bush, while 0.8% burns them. While 194 (77.6%) of respondents have dust bins in their homes, 52 (99.9%) of those without waste bin reported throwing away their waste after sweeping. Majority 234 (94.8%) do not separate their waste before disposal, reason given some (35.2%) being that all is waste, and therefore does not need any separation. There was a significant association between owning a dustbin and how the households dispose their waste [x^2 =30.3, p value 0.003].

Table 4 shows the knowledge of household heads in relation to health effects of poor waste disposal. 81.6% of household heads were aware of the health implication of poor waste disposal. Knowledge of diseases in relation to poor waste disposal by household heads includes; Cholera by 74.1%, malaria by 36.3%, diarrhoea by 32.4%, typhoid by 20.6%, and dysentery by 8.3%. Thirty nine (19.1%) other respondents mentioned other diseases such as pile, body odour, HIV, hook worm, ring worm, vomiting, and hernia as other diseases associated with poor waste disposal.

Knowledge rating of household heads in relation to diseases is shown in Figure 3. Most of the household heads 173 (69.2%) had poor or no knowledge of the health implication of poor waste disposal, 71 (28.4%) had a fair knowledge, while only 6 (2.4%) had a good knowledge.

In table 5 there is a significant association between educational level of household heads and the knowledge of the diseases associated with faeces ($\chi 2$ = 29.1, p value = .001). 100% of household heads with the university education though very few had either a good

Table 1. Socio-Demographic Characteristics Of Household Heads (n = 250)

Characteristics	Frequency	Percentage
Sex		
Male	176	70.4
Female	74	29.6
Religion		
Catholic	39	15.6
Protestant	29	11.6
Pentecostal/Charismatic	56	22.4
Muslim	91	36.4
Traditional Religion	19	7.6
None	16	6.4
Age Group		
20-29	29	11.6
30-39	50	20.0
40-49	57	22.8
50-59	40	16.0
>=60	74	29.6
Educational Level		
None	134	53.6
Primary School	21	8.4
Middle/Contn. Sch, Jss	63	25.2
Tech/Comm./SSS School	19	7.6
Post Secondary	10	4.0
University	3	1.2
Marital Status		
Married	195	78.0
Living Together	6	2.4
Widowed	22	8.8
Divorced	9	3.6
Separated	4	1.6
Single	14	5.6
Occupation		
Professional	17	6.8
Clerical/Secretarial	12	4.8
Seamstress, Hair Dresser Etc	9	3.6
Trader/ Food Seller	46	18.4
Labourer/ Farmer	138	55.2
None	17	4.4
Other (Drivers, Pensioers, Blacksmith)	11	6.8

and fair knowledge of the diseases associated with faeces as against 22.4% of their counterpart without any education.

DISCUSSION

The study provided some basic information on challenges facing Kintampo North district in their handling of waste in the district. It has also assessed the knowledge, attitudes, perceptions and practices of households and community members regarding waste disposal in the district, and its health related disease in their environment. The general usage and availability of sanitation facilities is very low in the study area. The majority of the respondents 84.4% do not have toilet facility in their homes and therefore rely on public latrines or practice open defecation. The toilet facilities in homes with toilets are mainly pit latrines. Only a handful had flush latrines or bucket latrines. Similar research carried out in northern Nigeria showed comparable results where 20.9% of households practiced open range defecation and 70.1% of the households

Table 2. Type of toilet facilities among the household heads

Characteristics	Frequency	Percentages
No. of people in the household		
1-4	105	42.0
5-10	113	45.2
11-15	16	6.4
Above 15	16	6.4
No. of household with toilets		
Yes	39	15.6
No	211	84.4
Households With Toilets (39)		
No. of toilets in the household		
One	35	89.7
Two	4	10.3
Where is the toilet located?		
Within Compound	30	76.9
Outside Compound	9	23.1
Type of toilet facility		
Pit	17	45.6
Kvip	12	30.8
Water Closet	9	23.1
Bucket Latrine	1	2.5

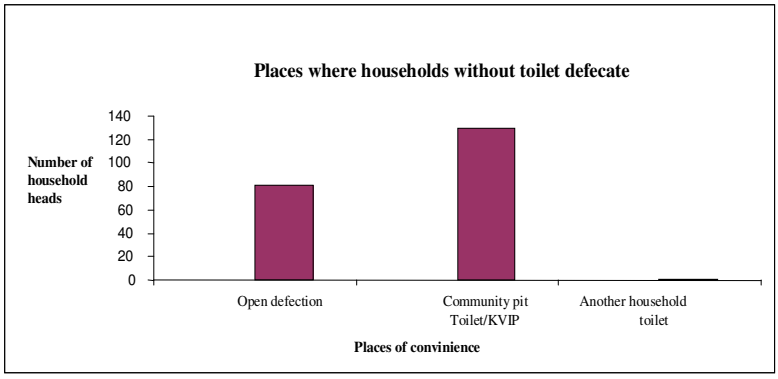

Figure 1. Places where households without toilet defecate.

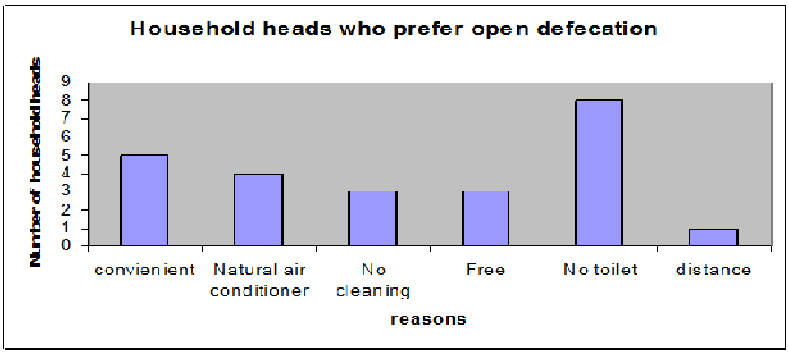

Figure 2. Reasons for open defecation. (n = 23)

Table 3. Household practices in relation to waste disposal.

Practices	Frequency	Percentages
Who disposes off waste in the house?		
Sanitary worker	1	0.4
Adult	116	46.4
Child	133	53.2
If child what age? (n = 133)		
Below 10yrs	14	10.5
Above 10yrs	119	89.5
Where do you dispose off waste?		
Backyard	22	8.8
Refuse dump	207	82.8
Bush	19	7.6
Others (burning)	2	0.8
Do you have a waste bin? (n = 250)		
Yes	194	77.6
No	56	22.4
Where is waste stored before disposal? (n = 56)	52	92.9
Just throw away after sweeping	4	7.1
Keep outside the compound in a corner		
Number of dustbins (n = 194)	159	82.0
1	33	17.0
2	2	1.0
3		
Do you separate waste?		
Yes	13	5.2
No	237	94.8
If yes, Why do you separate		
Neater	5	38.5
Easier to dispose	3	23.0
Good practice	5	38.5
Why don't you separate waste		
Its faster	46	19.4
All waste is waste	83	35.2
Others* (having just one dustbin)	47	19.8
No reason	61	25.7
How often is waste disposed off?		
Daily	247	98.8
Twice a week or more	3	1.2

used pit latrines (Ebong, 1994). People in such communities are much more exposed to faecal pathogens, a situation that can result in increase in diarrhoeal prevalence through oral route. The health hazards this presents is especially obvious for children who play on faecal contaminated grounds. Open defecation, use of pit latrine, disposal of waste in open places, use of children for waste disposal are very common practices among the study population. This has serious health implication and a lot need to be done especially in the area education for better community awareness in promoting good health care.

Sullage is waste water from domestic and industrial activities which must be properly treated and disposed off to avoid environmental and health hazards. Sullage discharge, if unregulated leads to haphazard discharge of waste water (Boadi et al., 2005). Information from the Focus Group Discussions and In-depth interviews showed that none of the discussants practised safe disposal of waste water. Majority said they built 'catch pits' at the back of their bath houses to collect water, some dispose theirs untreated into open drains in their

Table 4. Knowledge of household heads on the health effects of poor waste disposal

Knowledge	Frequency	Percentage
Is poor waste disposal harmful? (n = 250)		
Yes	243	97.2
No	7	2.8
If yes, Why is it harmful? (n = 243)		
Cause disease	199	81.9
Smell bad	42	17.3
Don't know	2	.8
If No, Why is it not harmful? (n = 7)		
Cannot transmit disease	2	28.6
Don't know	5	71.4
Do you know any diseases related to poor waste disposal? (n= 250)		
Yes	204	81.6
No	46	18.4
If yes, What are the diseases? (n = 204)		
Cholera		
Yes	151	74.0
No	52	26.0
Typhoid		
Yes	42	20.6
No	162	79.4
Dysentery		
Yes	17	8.3
No	187	91.7
Malaria		
Yes	74	36.3
No	130	63.7
Diarrhoea		
Yes	66	32.4
No	138	67.4

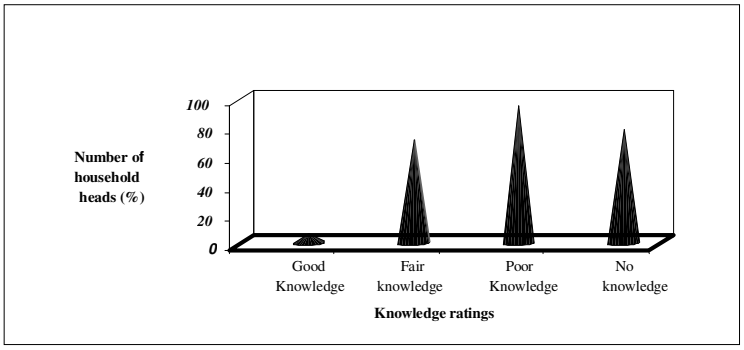

Figure 3. Knowledge ratings of household heads on diseases related to poor waste disposal

yard, and others in the streets. Boadi et al., (2005) made a similar observation in his study in Accra, were he noted only 8.9% of households in his study population practiced safe disposal of waste water into open tanks, and 51.4% dispose their waste water in open drains. Also in a similar study in Northern Nigeria by Ebong, (1994), 33% of households had properly constructed drainage systems for disposal of their waste water, whiles 67% disposed off

Table 5. Effects of Educational level on knowledge of diseases related to poor waste disposal

	Knowledge				Total
Educational Level	**Good Knowledge**	**Fair Knowledge**	**Poor Knowledge**	**No Knowledge**	
None	2(1.5%)	28(20.9%)	50(37.3%)	54(40.3%)	134
Primary School	1(4.8%)	3(14.3%)	7(33.3%)	10(47.6%)	21
Middle Schl/Jss	1(1.6%)	26(41.3%)	24(38.1%)	12(19.0%)	63
Sss/Technical	0(0.0%)	5(26.3%)	12(63.2%)	2(10.5%)	19
Post Secondary	1(10.0%)	7(70.0%)	2(20.0%)	0(0.0%)	10
University	1(33.3%)	2(66.7%)	0(0.0%)	0(0.0%)	3
Total	6	71	95	78	250

$\chi 2 = 29.1$, p value = .001

theirs into open drains. The disposal of waste water in the household yard and streets creates stagnant pools which facilitate the breeding of disease vectors (Boadi et al., 2005). Stagnant pools are potent sources of malaria infection. Malaria accounts for 39.7% of all reported cases infectious disease Ghana in 1995, and 53% in 2001 (Domfeh, 1999), and is a major cause of morbidity in the Kintampo North District. It also carry a spectrum of endemic faecal pathogens including helminthes, protozoan, bacteria and viruses, the concentration of which can be great enough to create the potential for human infection (Shuval et al, 1986). Often children are the victims of water-borne diseases which have become prevalent in Ghana (Domfeh, 1999).

The majority of the households (77.6%%) have dustbins at home which have an effect of how the households dispose their waste [x^2 =30.3, p value 0.003]. Most households who have dustbins dispose of their waste at the refuge dumps and some openly threw them away thus littering their environment. The storage of solid waste in plastic bags outside the home is a serious health problem as scavenging animals (dogs, cats, pigs, goats, rats and mice) can break into the bags and scatter the refuse, leading to sources of infection. None of the households have a house to house collection service in the Kintampo North district; this is remarkably worse compared to the findings in Accra where 80% of households do not have home collection of waste (Boadi etal., 2003). Solid waste is dumped at communal collection points, open spaces or in the open gutters. The discussants mentioned that sanitary workers never visit their homes and they dump their waste at the refuse dumps or any available space because either the containers provided are too far from their homes or there are no containers at all. Containers and refuse heaps are not frequently collected or emptied when full so they are forced to dump their waste in the open. These have created huge waste heaps which pose health threat to people who live in close proximity to these places due to the rapid decay of organic matter. This has also led to the choking of gutters creating unsanitary environment and breeding grounds for pests and parasites.

The people responsible for disposal of waste in the Kintampo North district are mostly children (53.2%) with the rest being women; 10.5% of these children were below 10 years of age. Children, due to their reduced immunity, their immature physiology, and the fact that they are growing and developing at a rapid rate, are even more vulnerable than adults to the adverse health effects of chemical, physical and biological hazards, (WHO, 2002). Studies have shown that children absorb lead twice as fast as adults (WHO, 1979).

Over 97% of the households felt poor waste disposal was harmful, whiles 81.6% knew of diseases related to poor waste disposal. However, only 2.4% were recognised as having a good knowledge of diseases related to poor waste disposal, while 31.2% had no knowledge at all. Lots of education on health and environmental implications of poor waste disposal are urgently required in this community. Educational level had a bearing on the household heads knowledge of diseases related to human faeces (χ^2 = 51.7, p value < 0.01). Other studies have shown that educational levels influenced knowledge of the effects of poor waste disposal (Ebong, 1994). Cholera, malaria, typhoid, diarrhoea was mentioned as the main health effects of poor waste disposal. Other diseases mentioned by the discussants included AIDS, ring worm, piles, tuberculosis. Other effects of poor waste disposal as mentioned by the communities were air pollution, a dirty environment which not only brings shame to the community but also drive away development, and smoke from burning the refuse heaps which causes catarrh. This a clear indication that the community had fair knowledge on the health and environmental effects of poor waste disposal.

Waste separation is not common practice in the Kintampo district and in most of Africa. It is still an area that requires a lot of enlightenment and education. The findings from the study showed that the community knowledge on waste separation and its importance was almost non-existent. Waste separation at source can enhance the homogeneity of the waste recovered and minimize its level of contamination (Wasteserv Malta,

2004). Findings by Kelly, (1993) showed that in order to reduce cost of treatment of domestic waste there is need to sort their waste into different types at the point of generation.

CONCLUSION

The lack of or inadequate sanitation facilities has created severe environmental and sanitation problems such as indiscriminate dumping of waste, discharging of waste waters into the environment as well as open defecation which poses major health hazards to the community especially mothers and children. Obstacles such as poverty, inadequate provision of waste disposal facilities, and the low level of environmental health awareness has to be tackled urgently. Measures for improvement must involve the introduction of physical, social, economic and organizational framework.

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