

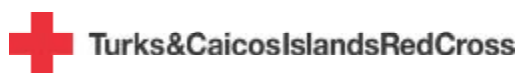
Water, Sanitation, Waste & Hygiene, a base line survey

Report on the short TCI Red Cross Water and Sanitation survey in North Back Salina, South Back Salina, Over Back and West Road in Grand Turk, Turks and Caicos Islands



Survey within the context of the TCI RC recovery operation, supported by British Red Cross, after Hurricanes Ike and Hanna of September 2008

**TCI Red Cross – British Red Cross,
August – September 2009**



Water, Sanitation, Waste & Hygiene, a base line survey

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PART A: Background to the Study and Methodological Approach

1. Introduction

Grand Turk Island is an island in the Turks and Caicos Islands archipelago (Figure 1). It is the largest island in the Turks Islands (not the Caicos) with 18 square kilometres. It contains the territory's capital, Cockburn Town which has been the seat of government since 1766. The island is the administrative, historic, cultural and financial centre of the territory, and has the second largest population of the islands at approximately 5,718 people (DEPSTC, 2006)*.

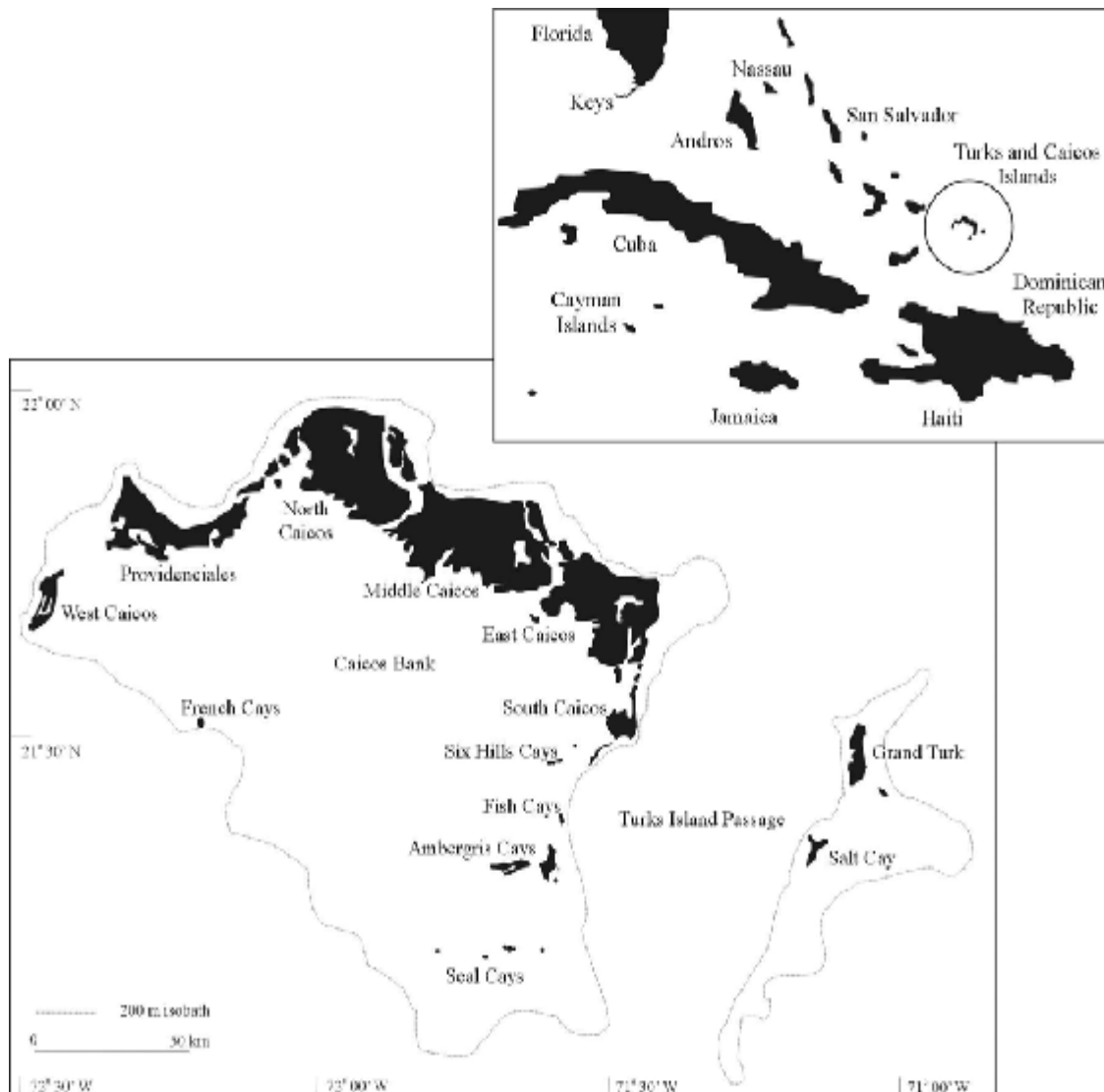


Figure 1: Location of Grand Turk in the Turks and Caicos Islands, Source: Clerveaux .W, 2000

The island of Grand Turk has limited physical resources such as agricultural land and fresh water supply. The local economy is fuelled mainly by the Government Sector and the Tourism Industry. The mean annual temperature of the region is 28°C, while the mean annual rainfall is below 800mm. Generally, the area is dry. The rainfall pattern is erratic and unreliable; therefore water for domestic use is scarce.

*due to illegal migration and challenges in recording an exact figure is difficult to establish (estimate Truelove: 6000 'Belongers', 2000 legal migrants, between 800 to 1000 illegal migrants)

2. Problem statement

There is a misconception that simply providing a fresh, clean water supply will substantially reduce water-borne illnesses. Research has indicated that access to safe drinking water must occur in conjunction with safe hygienic practices and access to sanitation if water-borne illnesses are to be effectively reduced, especially for children under five years old who are considered most vulnerable. Approximately 88 per cent of all diarrhoea infections worldwide are attributed to an unsafe water supply as well as a lack of safe hygiene practices and basic sanitation infrastructure (Evans 2005). The magnitude of this problem is back-dropped against the fact that twice as many people lack access to sanitation when compared with access to water supply (UN 2005). It is in this context that sanitation issues have ricocheted up the international policy agenda for risk reduction and sustainable development. As such, sanitation policy interventions have featured prominently in the Millennium Development Goals (MDGs). MDG 7 Target 10 proposes the reduction of persons without adequate access to basic sanitation by 50 percent by 2015.

In spite of the bold global objective of the MDG, intervention responses at national levels disparate, with large proportions of the poor in developing countries still lack sustainable access to safe drinking water and basic sanitation despite the implications for improved health and overall development. Improvements in water and sanitation in conjunction with behavioural changes in hygiene can make significant contributions to the reduction of related diseases such as diarrhoea, intestinal helminths, guinea worm, and skin infections. Water and sanitation improvements affect health primarily by interrupting or reducing the transmission of disease agents. Of primary importance in this process is the safe disposal of human faeces in order to reduce the pathogen load in the ambient environment. Improvements in water and sanitation do not automatically result in improvements in hygiene and health and must occur in conjunction with hygiene education in order to achieve the desired results. Basic messages that must be a part of hygiene education include regular washing of hands, proper disposal of faeces, and protection of drinking water from sources of pathogens (EHP 1999).

Some living conditions that are commonly associated with poorer developing countries, for example Haiti, Dominica, Dominican Republic etc can be observed in the TCI today. Some of these living conditions have an impact on the wellbeing of the larger population in terms of environmental quality and public health. At this point, it is important to note that, despite popular belief, this is not an issue limited to the migrant sections of society, but the above-mentioned living conditions have been observed across Turks Islanders and migrant communities (see further). The MDG's targeting water and sanitation issues are thus as relevant to TCI as many any other contexts. Interventions for community-level improvements in water and sanitation must be informed by comprehensive understanding of the relevant knowledge-base, attitudes and practices of the target population. The purpose of this report is to highlight the water-use and related sanitation knowledge, attitudes and practices based on a survey of targeted residents in the Grand Turk communities of North Back Salina, South Back Salina, Over Back and West Road in the aftermath of the impact of Hurricanes Hanna and Ike. The survey demonstrates the fragility of water and sanitation systems in non-diversified island economies such as Grand Turk and the implications of these specific vulnerabilities for the general population.

Prior to the impact of Hurricanes Hanna and Ike, levels of employment in Grand Turk were high, and almost exclusively in the civil service, tourism and small to medium sized enterprise, with minimal activity in the subsistence sector apart from a very small fishing sector (Truelove, 2008). However, many residents were living from 'hand to mouth' given the high cost of living in the TCI. On 1st September 2008 hurricane Hanna hit the Turks and Caicos Islands moving from a tropical storm to a category 1 hurricane. The weather system stayed over and around the islands for three days causing some localized flooding and some damage to housing, but not sufficient to derail the economy of the island. On the other hand, the impact of Hurricane Ike, a Category 4 storm six days later, and insufficient preparedness, mitigation, and emergency response or recovery/rehabilitation measures, caused extensive damage, particularly to the island of Grand Turk. The challenges of the disaster risk management system in dealing with these events also precipitated an extended period of suffering and erosion of basic amenities, especially for the poor. An estimated 80% of houses were damaged, of which 20% were severely damaged or beyond repair (IFRC, 2008). Disruptions in

the water supply system affected the entire island but crippled the already fragile sanitation systems in poorer communities and significantly increased related health risks. Direct impacts of the storm were accentuated by indirect consequences such as a reduction in tourism-related employment, especially among migrant work-permit holders and illegal migrants working in the informal sector, and reinforced by a serious regional economic downfall which led to the erosion of livelihoods and forced many to 'cut back' on sanitary measures such as the use of household cleaning agents, further increasing sanitation related health risks.

In the aftermath of the storm, residents in the poorer communities of Grand Turk rebuilt shacks (very similar to pre-hurricane conditions, but more precarious and extended to a larger section of society), using the meagre relief supplies such as tarpaulin that were provided by emergency responders. The structural quality of these shacks is very low and they do not adhere to planning regulations. Over 200 of these structures were deemed unsafe and earmarked for demolition by the Government after the hurricanes (Picture 1). However, due to a lack of alternative accommodation, the demolition never took place. The housing and sanitation problem is aggravated by landlords who seek to capitalize on the housing shortage in Grand Turk by leasing uninhabitable homes without requisite and adequate provision of toilet and bath facilities, some of which were destroyed during Hurricane Ike (Picture 2). In other occasions, the owners of the land are absent or claim to have lost power over the 'squatters' occupying their land. Truelove estimated the numbers of people made homeless or living in inadequate shelter and tents in October 2008 at 100 'Belongers', 500 legal migrants, 700+ illegal migrants. Since then, little has changed.



Picture 1: Houses that have been earmarked for demolition



Picture 2: Fairly typical shack situation, each door is one apartment

This housing stock of shacks (providing accommodation to an estimated minimum of 1500 - 2000 people) goes hand in hand with quite precarious water, sanitation and waste conditions. Many are without piped water and therefore have to rely on suppliers to bring water to the community via trucks or alternative and sometimes innovative, methods of transporting water to their residences. In some cases and especially on weekends when children are out of school, they are tasked with assisting parents in the transportation of water (Pictures 4 and 5). Where bathrooms were destroyed, previously existing pit latrines (not lined) were reconstructed or defecation in open spaces continued.



Picture 3: Bathroom destroyed during Hurricane Ike



Pictures 4 and 5: Water distribution point and transporting water from the distribution point to home

It is in this regard that the TCI Red Cross, in collaboration with the British Red Cross (BRC), decided to engage in a recovery operation targeted at water and sanitation in follow-up to its relief operation immediately after hurricanes Hanna and Ike. One part of the operation is targeted at providing more mid-term solutions to household level sanitation that can replace the temporary measure of the rental blue loos (which were initially funded by Rotary and then taken over by Red Cross) within budget limitations: construction of 60 combined toilet/ shower blocks with closed holding tank for the toilet, expandable into a proper septic tank, not linked up to water supply, infiltration trench for the shower outlet, reaching about 180 households, approximately 720 people. At the date of this report, construction of these provisions is ongoing. Linked to the provision of facilities, this survey was

decided upon to sustain the intervention with findings that can help the TCI RC, or other interested partners, in working towards more encompassing water and sanitation development of the targeted areas, including the importance of community sensitisation as discussed previously. Another part of the operation is targeted at improving the waste collection facilities in the same areas affected heavily by hurricanes Ike and Hanna and, therefore the survey also focuses strongly on the waste management practices at the household level. The Red Cross undertook this operation within its auxiliary role to the TCI Government during a disaster and within its independent mandate to support the most vulnerable.



Pictures 6 and 7: Blue Loo next to a pit latrine / improvised waste collection point

This operation coincides with the recovery efforts of the TCI Government (TCIG) following hurricanes Hanna and Ike. Their priority targets included education, disaster preparedness and health. Within the health and disaster preparedness priorities, it was also concluded by TCIG that water, clean up and sanitation were to be urgently addressed. This recovery operation is ongoing at the date of this report.

3. General and Specific Objectives

General Objectives

1. To provide a data baseline against which the effectiveness and success of water and sanitation programmes could be assessed.
2. To provide background data and insights at the community level for evolving a suitable RC programme and strategy.

Specific Objectives

1. To evaluate the level and characteristics of access to drinking water supply in selected communities;
2. To investigate the habits, attitudes, perceptions and practices in relation to the storage, handling and consumption of drinking water;
3. To assess habits, attitudes, perceptions and practices in relation to personal hygiene;
4. To assess habits, attitudes, perceptions and practices in relation to the disposal of solid and liquid waste, including human excreta;
5. To investigate the level of awareness about sanitary aspects of water supply;
6. To investigate the level of awareness about the relationship and impact of water and sanitation on the health of the people.

4. Methodology

Discussion of the methodological approach employed in this research focuses on:

- The rationale for the selection of the study area
- The design and administration of the questionnaire
- Sampling Techniques

Study Area

The rationale for selection of the study area is discussed at two levels. The first relates to the appropriateness of the island of Grand Turk in the Turks and Caicos for a study of this type and is summarized in the background for the study and the problem statement of this report. The basic point here is that following the passing of both Hurricane Hanna and Ike in September 2008 approximately 80 percent of homes or businesses on that island were partially or severely damaged. This further aggravated a number of pre-existing issues, such as poor sanitation conditions, lack of access to clean running water and the occupation of uninhabitable homes. In that regard, the island of Grand Turk is deemed to be appropriate for a study of this nature.

The second level of rationalization relates to the selection of sample sites within Grand Turk. Grand Turk is made up of several communities but the social issues alluded to earlier in this report are largely confined to the poorer communities, namely North Back Salina, South Back Salina, West Road and Over Back, which were also most severely hit by Hurricanes Hanna and Ike. The first step in the data collection process was to ascertain the status of these communities with regard to key variables of the WATSAN survey, namely sources of water supply and access to sanitation facilities. It was estimated by external sources that only 29 percent of the households in these communities have private water supply systems and only 21 per cent have a private latrine. Thus, the majority of the population in these communities depends upon 'public' sources of water and either defecates in an open space or use a neighbour's toilet facilities.

Design and Administration of the Questionnaire

A structured questionnaire (Appendix 1) was used to collect primary data from residents, with the objective of gaining insight into and documenting the existing perceptions and conditions relating to water use, hygiene and the sanitation situation in the selected communities. The survey was conducted in August 2009, starting with a pilot survey of 6 households on the island of Grand Turk in the West Road Community. Given the overarching social development goals of the survey, the questionnaire was developed and reviewed in consultation with the Department of Social Welfare and the PACE program. These reviews resulted in minor modifications to the questionnaire, particularly with regard to ambiguities and length. Field administration of the revised questionnaire commenced in mid-August, 2009 and was completed over a two-week period. In most instances, interviews were conducted at or near the residence of the respondents, so as to standardize observations made in relation to levels of living, state of the property and the general hygienic conditions in which residents live. Since translation of questions into the vernacular was often necessary, the interviews were conducted in a relaxed and informal environment, and households did not have to become bogged down with the interpretation of questions. Being relaxed, respondents tended to be more elaborative, as they had a better sense that they were playing an informative and critical role in the research, and that their participation could help to shed some light on the issues facing many residents since the passing of Hurricane Hanna and Ike in September 2008 in the Turks and Caicos Islands.

10 Red Cross volunteers were selected to conduct the survey in the field. The TCI RC – BRC community/ disaster manager of the recovery team guided them through the survey in an initial meeting to clarify the different lines of questioning and during the work in the field. While the questionnaires were not translated into other languages, volunteers that are fluent in Spanish and French/Creole were recruited to assist in conducting the surveys. 20 percent of the population of each of the communalities mention earlier was covered by the survey which accounted for 830 people altogether. Each questionnaire took about 45 minutes to complete. The questionnaires were subsequently entered into SPSS and results obtained.

Sampling techniques

In Grand Turk, 4 communities were selected on the basis of the level of impact sustained from the passing of Hurricane Hanna and Ike and their inability to quickly on their own return to a stage of normalcy. Attempts were made to ensure spatial representation in the sampling of 50 households within each community.

Two basis criteria were employed in the selection of households for the survey

1. Either, households had to be currently using pit latrines or,
2. Households did not have any indoor or outdoor toilet facilities

Major road networks were identified and earmarked as starting points for the survey. Two surveyors were sent on each road, one person responsible for surveying the houses on the right hand side, the other the left. Given the absence of a thorough data base of persons currently using pit latrines or who may require proper toilet facilities, the researchers relied on the list provided by the Department of Environmental Health of the names of persons who had required toilet facilities following Hurricane Ike. This list was supplemented by field reconnaissance surveys that were previously undertaken, and a combination of a snow balling technique. Having identified the sample, the respondents had to be 18 years or older to participate in the survey.

PART B: Presentation of Results

Discussion of the results begins with an overview of the social profile of the communities surveyed so as to provide a social context for the survey. The rest of the discussion is devoted to discussion of the findings as they relate to the objectives of the survey: water, sanitation, waste & hygiene, followed by knowledge, attitude and practice.

SOCIAL PROFILE

Brief community composition

A total of about 200 households were sampled among 4 communities in Grand Turk. The population of the households were of various nationalities but consisted mainly of Turks Islanders, who in the categorization of national status are referred to as 'Belongers', Haitians and Dominican Republic. The results indicated that there were more males than females in the communities sampled and more children between the ages of 6-15. North Back Salina had the greatest number of women, men and children ages 6-15 (Figure 2). The average age of the sampled respondents was 40 years with the modal age group being 31-40 years (Figure 3).

Figure 2: Breakdown of household size by adults and children

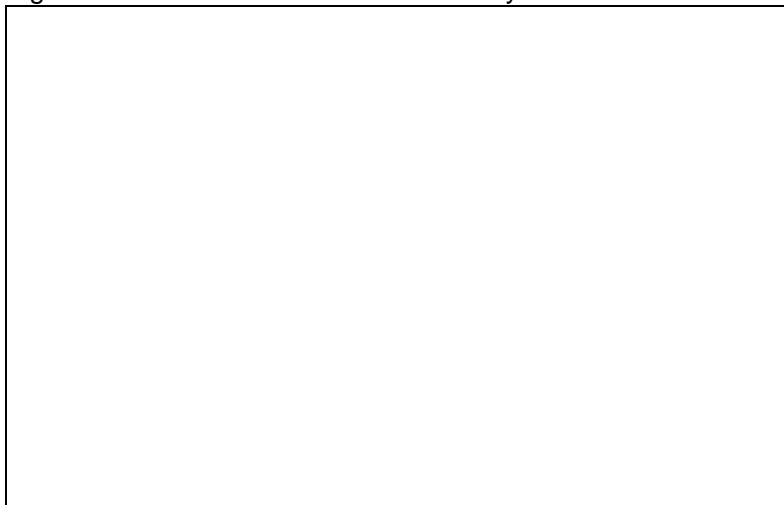
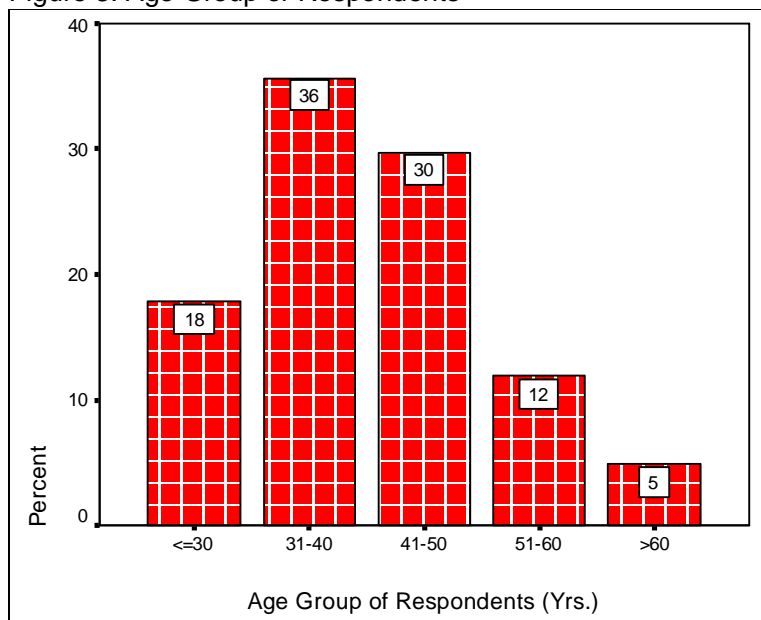


Figure 3: Age Group of Respondents



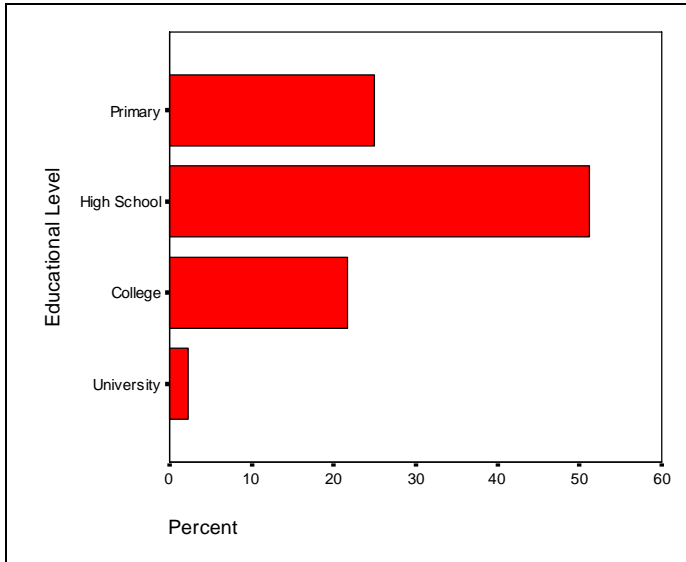
Gender

Gender analysis is vital in any work to improve sanitation and hygiene. The importance of involving both women and men in the management of water and sanitation has been recognized at the global level, starting from the 1977 United Nations Water Conference at Mar del Plata, the International Drinking Water and Sanitation Decade (1981-90) and the International Conference on Water and the Environment in Dublin (January 1992), which explicitly recognize the central role of women in the provision, management and safeguarding of water. Although 52 percent of the respondents were female, less than 15% of the households were headed by a female (Figure 2. Pg 9), a factor which might have implications for the decision-making role of women in relation to water and hygiene.

Education

As with most interventions for disaster risk reduction the role of education in the improvement of hygiene and human health cannot be overstated. Education is vital to helping reduce deaths from poor hygiene and insufficient preventative measures. Level of educational attainment of respondents was varied, ranging from primary through university but as anticipated the modal level of attainment was high school (Figure 4). From the perspective of the relationship between level of educational attainment and sanitation awareness, it is noteworthy that about 92 percent of the sample had at least attained primary level of education. While the extent of reinforcement of sanitation and hygiene principles at the primary level of education for non-nationals cannot be ascertained, the primary school system of Turks Islanders is a major source of related education and awareness promotion for children.

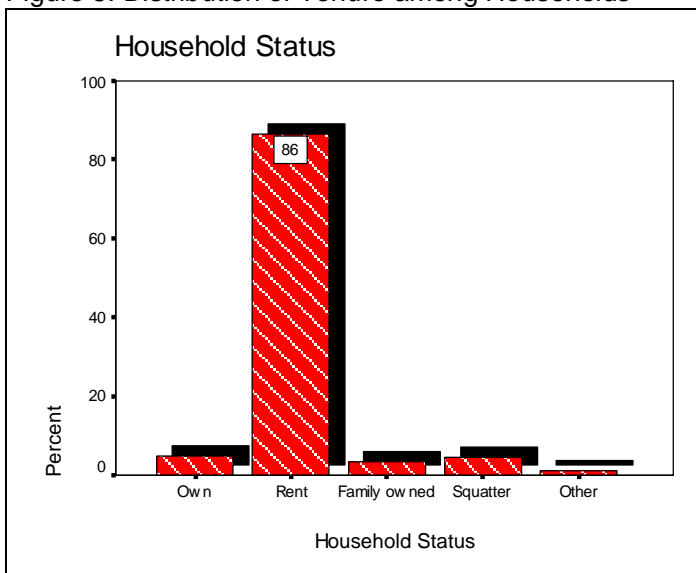
Figure 4: Educational level among respondents



Property Tenure

Ownership of property is commonly used in social research as an indicator of economic well-being. In the context of this research tenure of property determines the sanitation and hygiene modifications that can be undertaken by occupants. When property is legally owned, occupants are at liberty to undertake desirable modifications as long as these conform to the legal requirements of the state. Such liberties are rarely extended to tenants. At 86 percent, the incidence of rental was extremely high among the households surveyed (Figure 5). This pattern of tenure is a reflection of the low economic status of residents that is prevalent throughout the communities as well as the preponderance of migrant workers residing in these areas.

Figure 5: Distribution of Tenure among Households



The low economic status of these residents was aggravated in the aftermath of Hurricane Ike, because damage to the housing stock resulted in an escalation of rent and further marginalisation of the poor. Many of the houses where the survey was conducted are characterised by multiple occupancy and in some cases in excess of four families occupy a single house. Details on the economic status of the residents were not within the scope of this survey.



Picture 8: shack housing

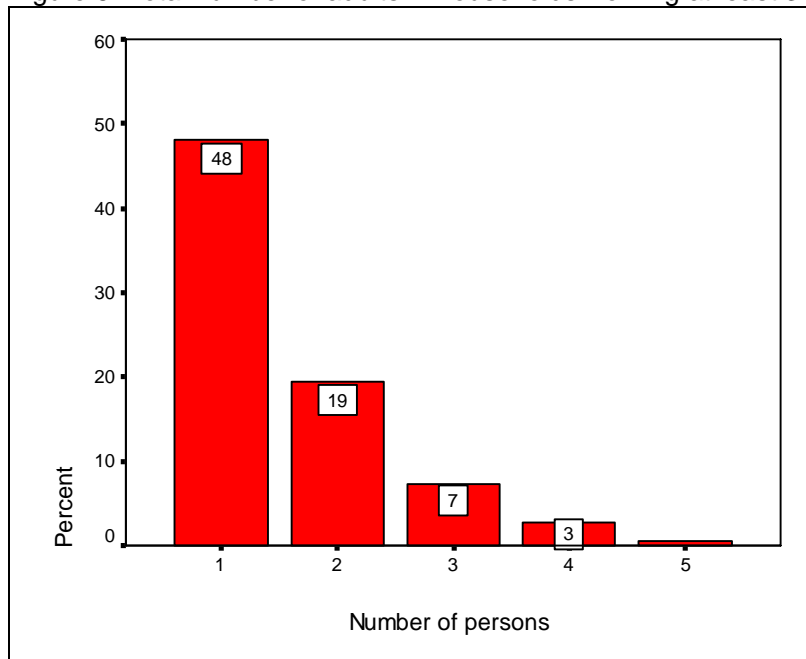


Picture 9: shack housing

Employment

The economic condition in the TCI, the impact of Hurricane Hanna and Ike and the global recession, have resulted in a number of persons being layed off in the TCI and specifically in Grand Turk. This situation has major implications for the development and sustainability of livelihoods of residents since over 80 percent of the workforce are directly or indirectly employed by the Government. According to the survey 48 percent of homes had at least one adult working (Figure 7) and many of these residents complain that sometimes the money was insufficient to make ends meet, as often the type of job was low skill work which innately carried low salary.

Figure 6: Total number of adults in households working at least 3 times per week



WATER

Around 1.1 billion people globally do not have reliable access to improved water supply sources. Supply of safe drinking water is one of the most important contributing factors to improving the health of the people in any country. Distance to the water point and the time taken at the water point are two major factors that determine access to potable water. In that context the discussion of water access issues focuses on household source of water, consumption, water treatment, cost, storage etc.

Sources of Water

The TCI has a variety of water sources. These include:

- i. Public harvesting of rainwater (Government catchment tanks)
- ii. Private harvesting of rainwater (household catchment tanks)
- iii. Bottled water
- iv. Public Reverse Osmosis plant
- v. Brackish and saline water
- vi. Public rainwater harvesting is the gathering and storing of rainwater. It is used to provide water for drinking water and household chores and is one of the most economical water sources in TCI.



Figures 10: Government distribution point

The water from the public harvesting facilities is being distributed from government distribution points and is further included in the results.

ii. Private rainwater harvesting (household catchment tanks)



Picture 11 and 12: Private catchment tank

Private harvesting of rainwater is the cheapest source of water for residents, but this option is not always available to persons who rent. Private harvesting of rainwater is practiced by a minimal number of people targeted in this survey and was excluded from the rest of the results, as no significant data could be collected.

iii. Bottled water (available in stores and vending machines)

Bottled water (mostly imported) is one of the most expensive sources of water in Grand Turk and therefore is primarily used for drinking.



Plate 16: Typical water vending machine

Bottled water and vending machine water can be considered similar, as the quality of the water is practically the same and both are more expensive than water from the government distribution points.

iv. Reverse osmosis (distributed through a public water distribution network)

The water produced in the public reverse osmosis plants is fed into the public water supply network. None of the surveyed households was connected to this network, so this source does not appear further on in these results.

v. Brackish and saline water

Brackish and Saline water were not used by any of the targeted households as they have no means and/ or habit to use this water.

Government tanks

Overall, there are a significant number of homes with no access to piped water (often referred to as 'city water'). As a result, water has to be transported in plastic barrels, water bottles or buckets. During the drought season in Grand Turk, household catchment tanks empty increasing the number of residents reliant on Government catchment tanks for water supply. As such, it is common to see long queues of vehicles (Plate 17-18) or residents (Plate 19-22) waiting to purchase water. The situation is often worsened when mechanical issues with the water pump leaves many houses dependant on piped water without water. This result in increased competition for Government water between residents who normally use this source and residents who are forced to use the Government water supply as a result of reasons mentioned above. (see later).



Pictures 13 and 14: Queuing of vehicles to purchase water from government tank

The functionality of a water point is often denoted by the amount of time taken to obtain water. Oral communication with residents at the Government water tank indicated that many queue for water as early as 3am even though the water tank begins water distribution at 9am. Some indicated that they spend up to 4 hours in line for water. This excessive queuing exceeds the 15 minutes recommended by SPHERE and can indicate malfunctioning water points, an inadequate number of water points or low water levels. Excessive queuing times for water collection can have negative results including increased consumption from unprotected surface sources, reduced per capita water consumption and reduced time available for other essential chores.

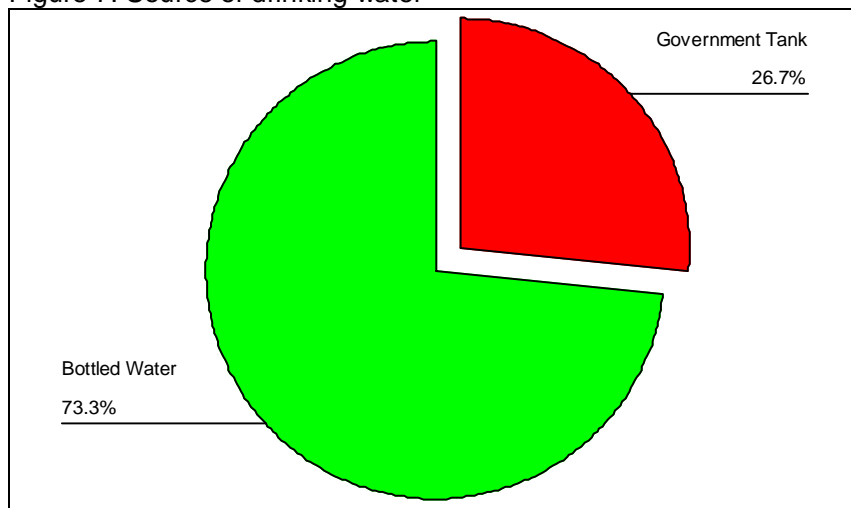


Pictures 15 and 16: Queuing of Residents for water at the Government Tank

Source of water for drinking and household chores

The main source of drinking water among respondents was either bottled water purchased from supermarkets or vending machines (73%). Just 26% of respondents stated that they often drink the water obtained from the Government tank (Figure 6).

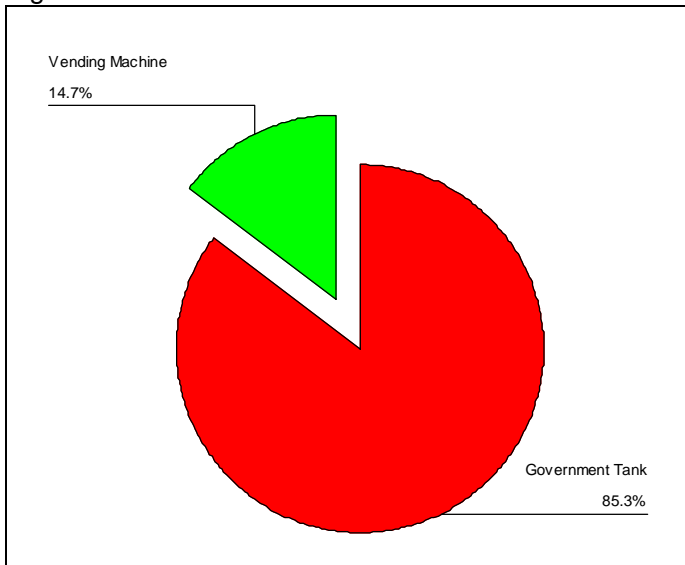
Figure 7: Source of drinking water



Residents of Grand Turk do have access to safe and clean drinking water. However, this access comes at a great cost to those whose funds are already limited living pay check to pay check and those living below the poverty level. This situation is exacerbated by the fact that in the communities sampled less than 50% of the adults were employed.

Government tanks were the primary source of water for non-drinking purposes, although vending machines were frequently used by some for cooking purposes (Figure 8).

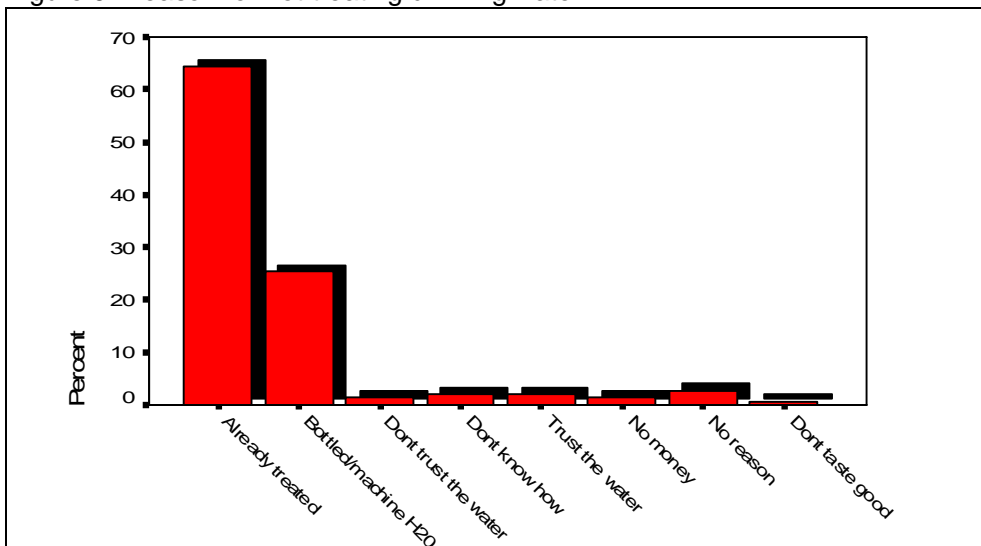
Figure 8: Source of water for household chores



Water Treatment

Residents were reluctant to drink water obtained from the Government tank in spite of the expense related to alternative sources and stated that *'they don't trust it'* or *'it makes them sick'*. Ironically, just 12 percent of persons who used water from the Government tank for drinking purposes treated it. The main reason for not treating drinking water was varied and included: 'water already treated (61%), and water was purchased from store/machine (24%), (Figure 9).

Figure 9: Reason for not treating drinking water



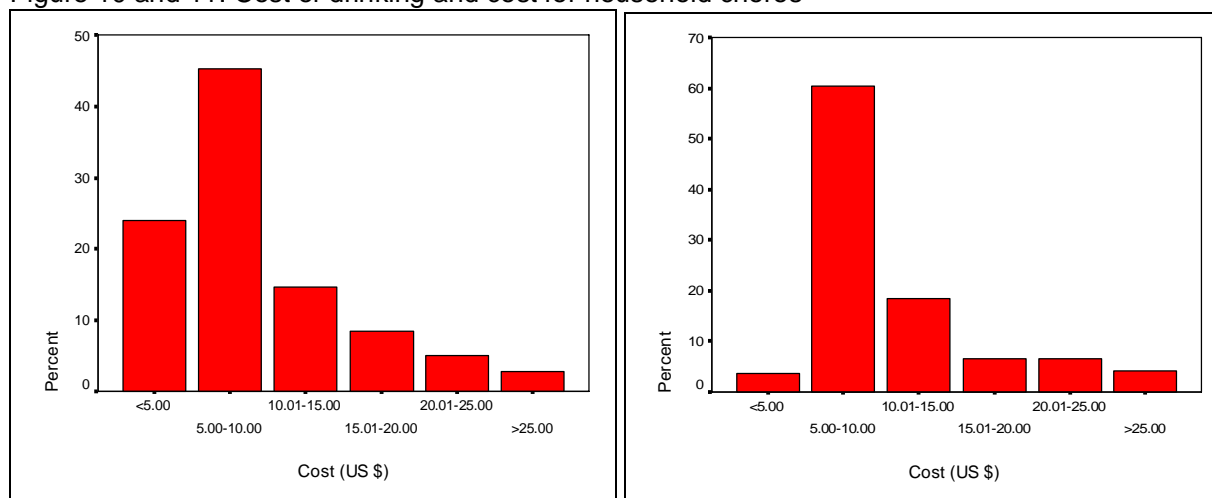
As stated earlier, water obtained from the Government tank was generally used by households for bathing, cleaning and washing (83%), and cooking (80%), although approximately 15 percent of the sample stated that they often used water obtained from the vending machine or bottled water to cook. About 31 percent of the respondents treated water used for purposes other than drinking. Chlorination using bleach was the most popular water treatment method used, accounting for 20

percent of the households. Non-treatment of water was related to its use for non-drinking purposes as well as a general feeling that the water is safe for its intended purpose.

Household cost of water

The data suggests that on average, households spend approximately US\$ 5.00-10.00 on drinking water and the same amount for household chores per week.

Figure 10 and 11: Cost of drinking and cost for household chores



Cost per gallon for water purchased from vending machines and supermarkets is US\$0.75 and \$2.50, respectively, while a 'drum' (50 gallon barrel) of water normally used for household chores costs US\$5.00-7.00, depending on the supplier. Generally, the cost of water in Grand Turk is considered by residents to be inexpensive but some respondents indicated that their households could not afford to purchase water, increasing their vulnerability to sanitation problems related to lack of water.

Water consumption

The Over Back district had the highest water consumption of 69.8 liters, followed closely by West Road. The household size ranged from 3.8 to 4.9 persons which translates into 12 to 17 liters per person per household (Table 1).

Table 1: Mean daily consumption of water in relation to household size in sampled communities

Communities	Household mean daily water consumption (liters)	Mean size	Household	Per capita water consumption (liters)
West Road	67.6	3.84		17
Over Back	69.8	4.04		17
South Back Salina	61.3	4.26		14
North Back Salina	60.3	4.98		12

In many emergency settings, as in these districts, water-borne disease transmission is due to insufficient water for personal and domestic hygiene and the consumption of contaminated water. Moreover, in two of these communities, household access to water falls short of the SPHERE recommended minimum standards of 15 liters of water per day per person for drinking, cooking, and personal hygiene.

Water Storage

Various factors, such as the container used to fetch water and the storage and handling of water at the household level, determine water quality at the household level. This is supported by various studies that indicate that the cleanliness of water at the household level is independent of the use of a protected water source. To prevent contamination of water at the household level, the water containers must be covered and washed. The West Road and Over Back district rated high for cleaning their drinking water containers prior to refilling them, whereas South Back Salina and Over Back residents were more likely to cover their drinking water containers (Table 2).

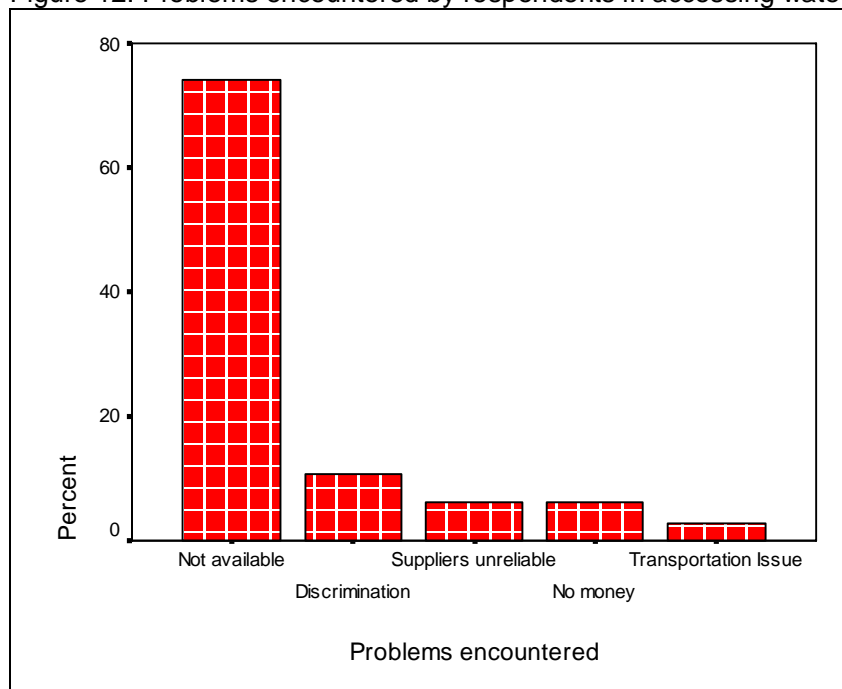
Table 2: Percentages of communities who cover and clean their drinking water containers

Communities	Clean Container %	Cover Container %
North Back Salina	78.0	60.0
South Back Salina	69.8	90.5
West Road	91.3	61.2
Over Back	93.8	74.0

Accessing water

As stated earlier, access to safe drinking water is very important to sustaining a healthy life and as such respondents were asked whether or not they encountered any problems in trying to access water, of which 64 percent of respondents answered in the affirmative. Of those who indicated that they encounter problems in accessing water, 74% stated that this was because water was not available while 11 percent cited discrimination as a factor in water access (Figure 13).

Figure 12: Problems encountered by respondents in accessing water



Respondents who stated that they were discriminated against when trying to obtain water were further probed as to what type of discrimination they encountered. Many reported that they were blatantly denied the option to purchase water especially when a limited amount of water was available or were told they have to wait until Turks Islanders, 'Belongers', were served.

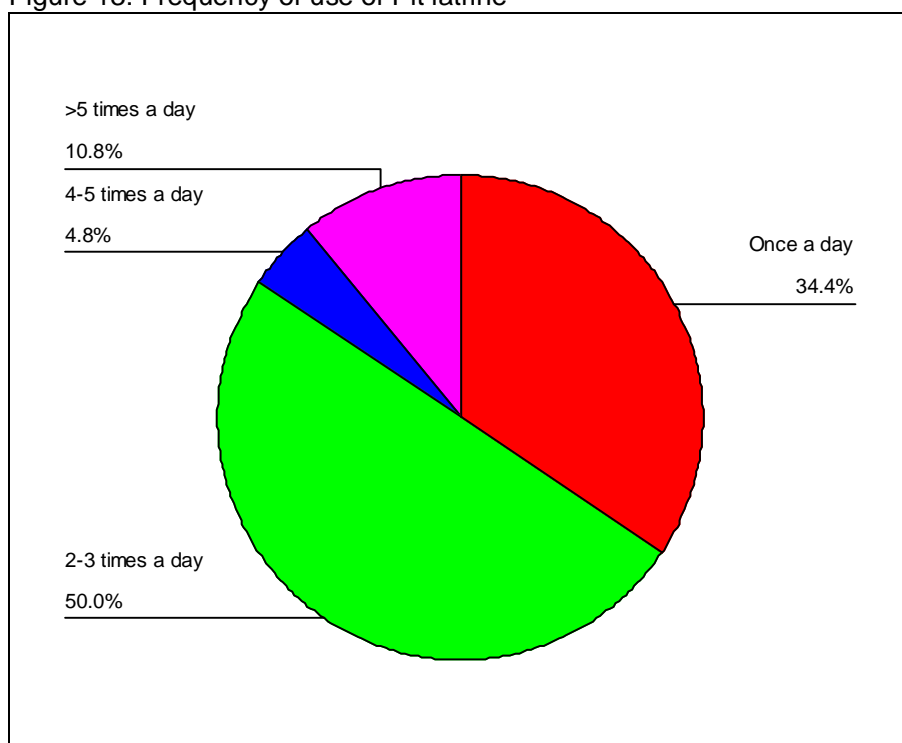
SANITATION

Household sanitation is everyone's responsibility, and everyone benefits from good sanitation. Yet the reality is that women make a disproportionate contribution to good household sanitation, and stand to benefit the most from better sanitation (Carolien van der Voorden & Kathy Eales 2002).

Use of latrines

The majority of sampled households used a pit latrine for the disposal of human excreta and to defecate, but there were a few households that lacked access to a latrine. In such instances, disposal was in a hole dug in the ground and then covered or on the surface in bushy areas that provide some level of privacy. To understand the extent and use of the pit latrines, the number of times per day that households use the latrine was recorded (Figure 14).

Figure 13: Frequency of use of Pit latrine



Child's faeces

Especially important is the safe disposal of a child's faeces given the significant number of households with children less than five years of age (30%). Only 15.5% of the respondents said that they threw baby stool into latrines, 6.6% use a potty, while 12.7% use disposal diapers. The remaining households with children stated that they used a combination of disposal methods including use of a potty which was then emptied into the latrine, nearby bushes/ground etc.

Sanitary condition of latrines

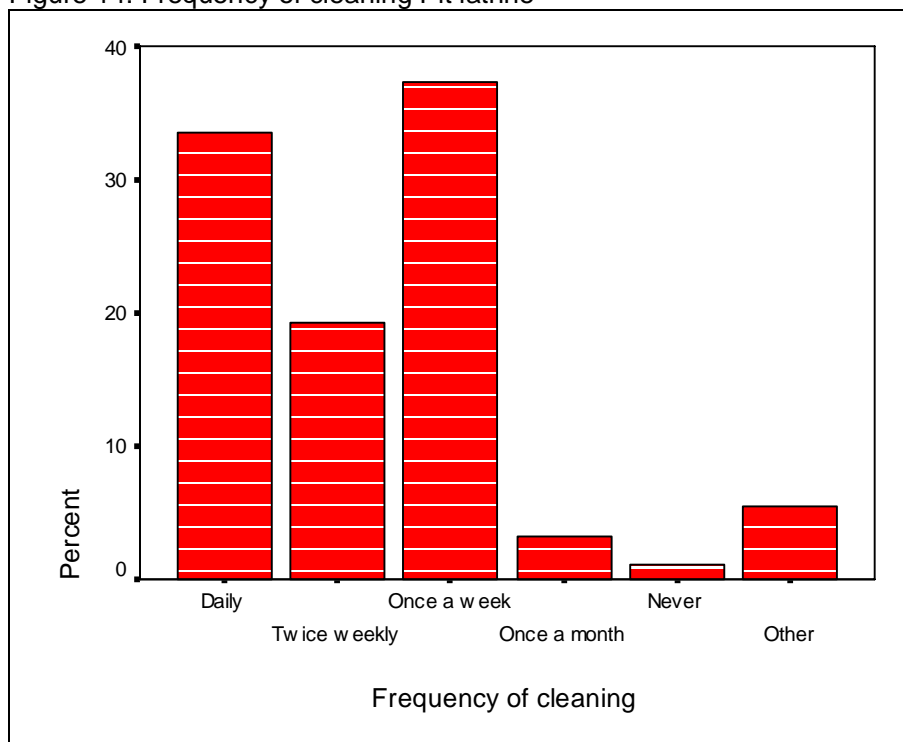
Generally the pit latrines that are being used by households are in a deplorable condition. Many are in need of major repairs or are beyond repair (Plate 23), some are full and need to be emptied and in many cases instead of paying to have them emptied they are simply abandoned and a new one is built. As such in a courtyard it is common to see several pit latrines but only one is deemed useable.



Picture 17: Condition of pit latrines that are being used by households

Although about 33 percent of respondents indicated that they cleaned this facility daily and 37 percent once per week, the adequacy and method of cleaning is questionable given the generally poor conditions of these latrines. However, less than 2 percent of respondents admitted to not cleaning their toilets at all. Structures are also difficult to clean.

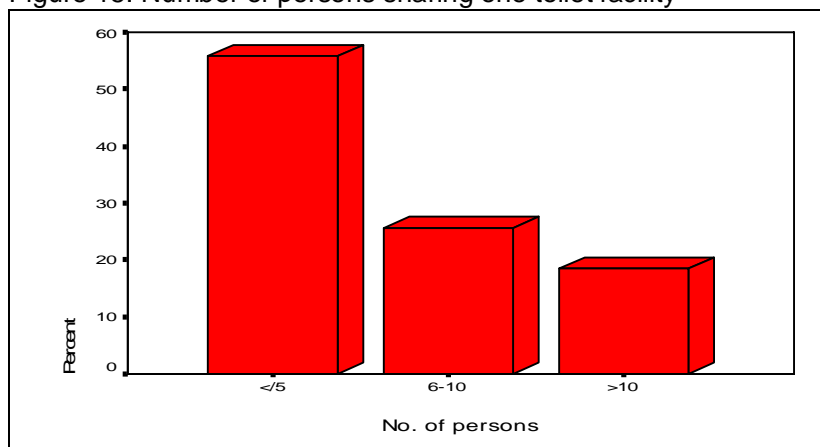
Figure 14: Frequency of cleaning Pit latrine



Number of people sharing sanitation facilities

Results of the survey indicate that the sanitation domain is predominantly a shared one with approximately 59 percent of respondents indicating that they were sharing toilet facilities with at least 1-5 other persons besides their household and in some cases with over 10 persons (Figure 17). Although most facilities were shared, no distinction is being made between male and female.

Figure 15: Number of persons sharing one toilet facility



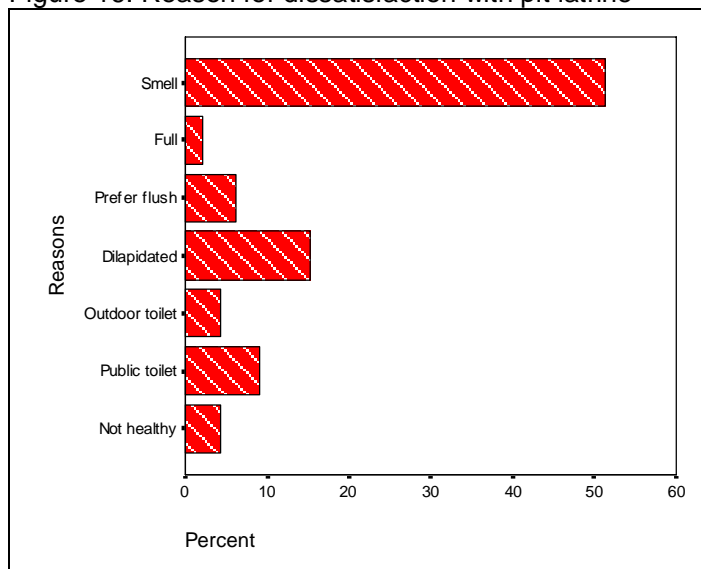
Alien use of pit latrines

In order to gauge current behaviour in terms of what is disposed of in the latrines and thereby identify areas of education that are required to inform appropriate behaviour in the use the new latrines, respondents were provided with a list of items and were asked to indicate which of them they dispose of in the latrines. In the survey, 54 percent of respondents stated that they have thrown sanitary napkins/tampons in the pit latrine, 13 percent have thrown clothes and 8 percent have thrown paper bags. Other items that have been thrown in the pit latrine are plastic items, pampers, paper towels etc.

Level of satisfaction with current sanitation condition

Residents were generally displeased with the latrines to which they have access to (Figure 16). Their discontent resulted from the poor physical condition of the facilities as well as the potential for disease associated with infestation by flies, cockroaches and rodents.

Figure 16: Reason for dissatisfaction with pit latrine



WASTE

Disposal of solid waste has similar implications for human health as sewage. Because there is normally coincidence between inadequate sewage and solid waste disposal in terms of the social groups at risk, issues related to solid waste disposal were addressed in the survey in order to obtain a comprehensive sanitation profile of the sampled communities.

Garbage Disposal

Most of the respondents employed multiple solid waste disposal methods. Approximately 89 percent of respondents in the survey indicated that they dispose of their waste by placing them in a garbage bin/dump (Figure 17). Less than 5 percent of respondents stated that they often throw their garbage in vacant lots or bushes. Another 89 percent stated that before placing their garbage in garbage bins/dump that the garbage is first placed in plastic bags (Figure 18).

Figure 17: Source of garbage disposal

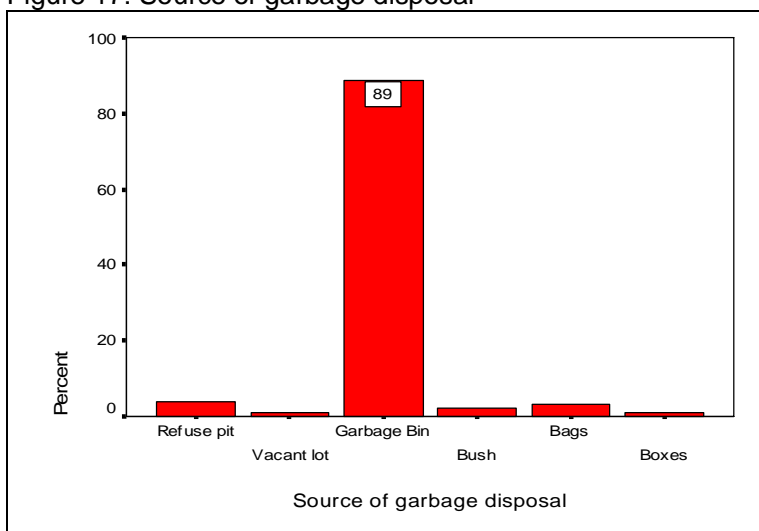
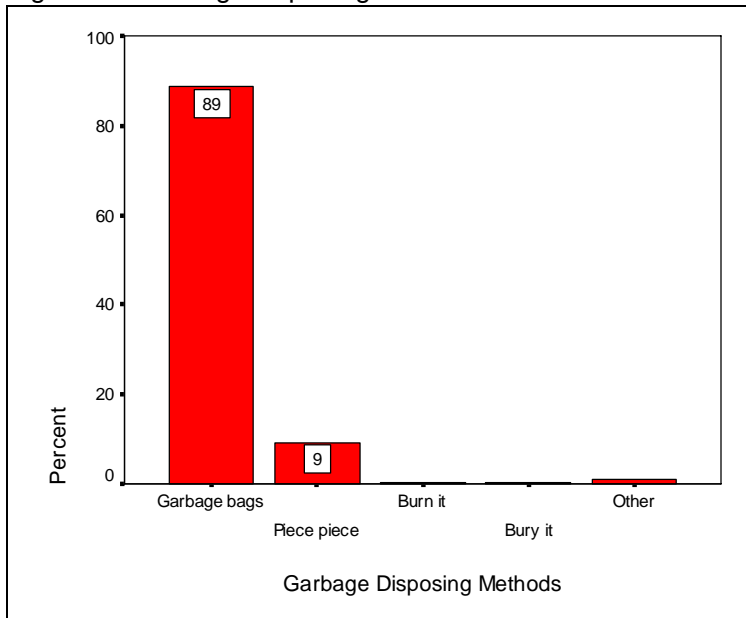


Figure 18: Garbage disposing methods



Garbage storage and collection

Just 34 percent of respondents indicated that a communal waste point was available in their community. However, observation by field assistants indicated that less than 30 percent of the communities visited during the survey had a visible communal garbage point.

The main problem experienced by respondents with regard to garbage disposal is the scattering of garbage set out for collection by animals. There were also complaints about the irregularity of the collection service which aggravated the problem of scattering by animals.

Collection of garbage in Grand Turk is primarily the responsibility of Government. Results of the survey indicated that 97% percent of households are serviced by the public garbage collection system. However, a handful informed that on occasions they had to transport their garbage to the public dump.

Cleanliness of yards and surroundings

The stated practices of respondents contradict observations, as garbage strewn empty lots, abandoned properties and waysides commonly occur throughout Grand Turk. (Plate 24-27 Improper Garbage Disposal). Approximately 33 percent of the surrounding courtyard where many of these surveys were conducted was rated by field assistants as very dirty, 43 percent were in fair to good clean condition and fewer than 25 percent were classified as clean.



Picture 18 and 19: garbage around collection points, yard and on the streets

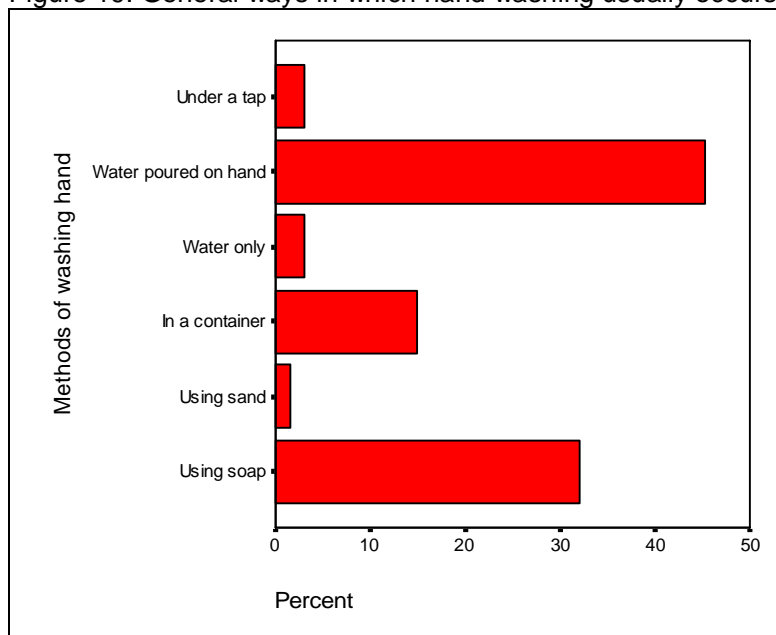
HYGIENE

Hand washing

Hand washing is one of the most effective ways to break the faecal-oral route of disease transmission. Hand washing behaviour is strongly influenced by the presence or absence of a convenient source of water and soap. Studies have shown that in-house water supplies are associated with reduced rates of diarrhoea (Boot and Cairncross 1993). Appropriate hand washing behaviour includes two dimensions: washing at critical times and washing technique. Basic hand washing could potentially reduce diarrhoea episodes by 30 percent in a given population. Respondents were asked to identify the main times that hand washing usually occurs. The most popular time that hand washing occurred was after using the toilet (45 %) followed by before eating (10%). The most common method of washing hands among the sample population was by water poured over hands (45%) and using soap (32%). It is worth pointing out that 15 percent of the

sample indicated that they often wash their hands using a shared container (Figure 19) which can result in recontamination.

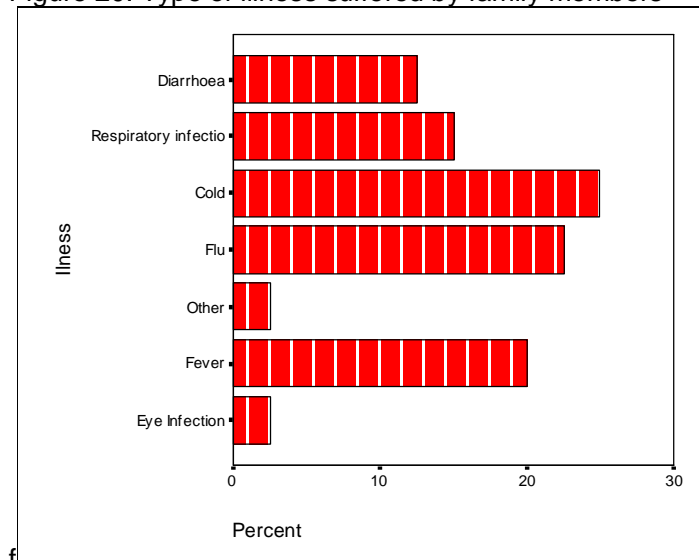
Figure 19: General ways in which hand washing usually occurs



Illness

Since there is a relationship between poor hygienic practice and ill health, residents were asked if anyone in their household has been ill in the past 3 months and the type of illness experienced. Twenty-two percent of respondents responded in the affirmative. The types of illness suffered by members of their household were mostly cold, flu and fever (Figure 20) and clinical evidence and published literature have indicated that there is a link between hygiene (hand washing) and respiratory illnesses (that includes cold & flu) (Elsevier, 2009). Therefore, the very high 25% prevalence of ill health is significant to the general sanitation and hygiene practices of the target population.

Figure 20: Type of illness suffered by family members



In order to investigate respondent's ability to establish a link between hygienic practices and the occurrence of diarrhoea respondents were asked to identify the main cause of diarrhoea from a list provided. Eating dirty food was perceived to be the most common cause (28%), followed by contamination of food by flies (9%).

Hygiene awareness

It is significant that 32 percent were unsure of the causes of diarrhoea as this indicates lack of awareness of the relationship between sanitation issues and intestinal problems such as diarrhoea. In the absence of this awareness it is unlikely that appropriate hygiene will be practiced. Perhaps this is an area that can be further probed and if necessary included in a hygiene promotional campaign. Additionally, respondents were asked if they could improve one hygienic practice what it would be. Thirty nine percent of respondents stated that they would clean their surroundings more often; the second most common response was that they would take a bath more often, perhaps 3 times a day and thirdly, they would wash their hands more often.

PART C: Conclusions and Recommendations

Research has indicated that water and sanitation improvements, in association with hygiene behaviour change, can have significant effects on population and health by reducing a variety of disease conditions. These improvements in health can, in turn, lead to reduced morbidity and mortality and improved nutritional status. The responsibility of improved water, sanitation, waste management and hygiene practices never lies with only one party. On each level of decision making, from the Government to the individual, improvements can be made that impact the well being, not only of the individual but of the larger population. Water, sanitation, waste and hygiene are shared responsibilities: reducing impact on the environment and public health benefits all. These conclusions recapture what could be highlighted based on the information gathered through the survey and try to formulate recommendations specifically for the individual household level as this is the most possible field of intervention for the Red Cross at this stage in time.

WATER

It could be concluded that the biggest concerns regarding water are in the following areas:

- Access to water is of great concern, in terms of waiting time, lack of public networks, distance and even discrimination based on nationality (and/or legal status).
- Access to sufficient water was seen to be a serious problem during the survey. If people have to survive with the bare minimum of water (some even below recommended Sphere standards) it becomes more difficult to expect cleanliness standards to be met.
- Access to suitable water sources: to optimise the use of scarce resources on the island.
- Access to affordable water: the price of water (or price of transport of water) is an important factor in the sufficient and adequate usage of people

Contrary to popular belief health benefits from improved water supply does not only occur through having a guaranteed minimal quality of water quality, but more so through increases in the quantity of water, which allow for better personal and domestic hygiene practices. The results of the survey indicated that a major problem facing many residents in Grand Turk is access to sufficient quantities

of water. Access to water is manifested in terms of shortages in water supply and in some cases the discriminatory prohibition of non-Belonger from purchasing water. In Grand Turk there are only two public water catchment areas which service all persons without personal water catchments or piped water. These catchments rely on harvesting of rainwater, resulting in widespread shortage of supply during the very extended dry season of the TCI. Even residents who are connected to the public distribution system are affected by shortages, owing to the poor maintenance regime of the water distribution network. Alternative water supply sources include commercially bottled water and reverse osmosis, but the relative high cost of access to these sources prohibits widespread access, especially for the poorest in the society. This forces many households to use less than the requisite 15 litres/day by adopting extreme conservation measures, often at the expense of adequate sanitation and appropriate hygiene.

At this point in time, the water situation in Grand Turk is quite critical. TCIG is well aware of that and is directing some of the recovery funds to address this problem. While TCIG however is concentrating on improving the supply of water, work at the individual household level needs to be done as well. While the public network may be expanded to each site that does not mean that each household will have sufficient access to that water. Conditions like cost, possibility to tap into that network, moments of scarcity etc may still occur. To create more resilient communities, in terms of water, other aspects need to be looked into. The individual households can improve their water situation by increasing and improving their storage capacity, keeping their water clean etc. Exclusive reliance on the Government to provide sufficient water for all is a narrow way of looking at the possibilities that exist at the household level. TCIG plays a major role in the provision of water, but a role can also be played by partners of the civil society, for example the Red Cross.

Recommendations:

Increase private rainwater harvesting and open it up for renters of shack areas

Advocate for increased rainwater harvesting for house owners, to reduce their reliance on public water in times of drought or public system break down

Increase the storage facilities at the household level, whatever the source of water may be, so that in times of scarcity, a buffer is built up at the level of the households themselves

Increase awareness around the need for clean handling and storage of water

Decrease discrimination

Increase awareness that the sanitation and cleanliness and health condition can have far greater reach than the households themselves

Increase awareness around need for treatment of water before using it for drinking

SANITATION

It could be concluded that the biggest concerns regarding sanitation are in the following areas:

- Access to sufficient sanitation facilities: sometimes over 20 people share toilets
- Access to adequate sanitation facilities: sanitation facilities should be such that the waste poses no risks to health and environment when it is released into that environment

- Adequate use of sanitation facilities: facilities are not always used for what they are intended
- Cleaning of sanitation facilities: cleaning is not always regular and thorough, the state of the facilities does not always allow for proper cleaning
- Maintenance of sanitation facilities: facilities need to be kept up and running and need to be emptied when full capacity is reached

The importance of improved sanitation in the promotion of better health is previously highlighted. While modest interventions for improved sanitation constructions generate significant value in regard to health improvement, the role of education and awareness promotion in facilitating behavioural changes in sanitation is underscored. The current poor condition of existing latrines, especially in tenement environments is an indication for the need to factor in a management and maintenance structure that will foster sustainability of outcomes through mitigation of the tragedy of the common which characterizes the prevailing situation.

Awareness around cleanliness can be more effective when sufficient and adequate facilities are available. The level of ownership increases the level of responsibility a person will be willing to take. Adequate facilities include neutralisation of the excreta before returning them to the environment. It should be possible to find technical solutions that answer to this context marked by limited access to fresh water, high water table etc. Again, the responsibility of proper sanitation is a shared one.

Recommendations:

Construction or stimulation of construction of closed disposal systems
Construct or stimulate the construction of facilities that treat the waste
Increase level of awareness and responsibility of land owners/ rent collectors to provide facilities
In case of shared toilets, stimulate men/ women separation
Create awareness on not throwing alien objects into facilities
Ensure enough water to clean the facilities
Creation of ownership of toilets to improve maintenance
Improve access to cleaning/ emptying services for the poorer section of society
Increase awareness on the damaging effects of using buckets / plastic bags for defaecation
Increase awareness on the damaging effects of defaecating in the open or emptying buckets in the open

WASTE

It could be concluded that the biggest concerns regarding waste are in the following areas:

- Protection of disposed garbage from animals: once animals get into the garbage bags, the garbage can not be picked up anymore and starts floating around
- Regular pick-up of garbage: irregularity of pick-up increases the previous problem, and is in itself a problem
- Stray garbage: once garbage starts 'floating' around, it is not being picked up anymore
- Awareness: there is not a profound understanding of the effects that garbage and unsanitary situations in yards can have on health, whether it be through animals or direct

The results of the survey on waste are quite interesting and seem contradicting. Almost everyone claimed to dispose of waste in plastic bags and take it to the collection point for pick-up. On the other hand, the survey takers observed that only 25% of the yards were clean. Somewhere in the cycle of garbage production, disposal and collection something is clearly going wrong. While the results of the survey suggested that the sampled communities are well served by the public solid waste disposal system, garbage is still carelessly disposed of by those without or with inadequate access to disposal systems. The survey indicated animals getting into the waste before it got collected and irregular collection times aggravating that problem. When asked which practices the targeted households would change by priority they stated cleaning up their yard more often. On the other hand, the widespread occurrence of improperly disposed solid waste observed throughout the island suggests the need for educational/awareness campaigns to mitigate the problem.

Recommendations:

<p>Construction or stimulation of construction of protected garbage collection points, away from animals</p> <p>Regular emptying of such points</p> <p>Awareness on the need of regular cleaning of such points</p> <p>Awareness on the need of regular cleaning of the yard</p> <p>Introduce methods/ techniques for picking up stray garbage more comfortably/ hygienically</p> <p>Awareness on the serious impacts of waste on health and environment</p> <p>Awareness on the fact that the impact extends beyond the limitations of the individual plot and affects the entire public health and environment of the island</p> <p>Dissuade people from throwing garbage directly into the environment</p> <p>Construction or stimulation of construction of garbage bins in the public terrain, also for people that pass by</p> <p>Reduce the production of garbage on all levels</p>
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HYGIENE

The study has shown that a significant proportion of the respondents (25%) have reported ill health over the last 3 months and 15.6% probably having diarrhoea at the time of the interview and hence the study has proved that the population has a health problem. The situation probably was aggravated due to the shortage of water that was experienced prior and leading to the undertaking of the survey. Additionally, it must be pointed out that some practices were noticed among the population that can be improved. Also, if the situation would become worse in any of its aspects (even less water available, less employment, malnourishment, migrating diseases or others), this situation could change quite quickly so vigilance is in any case due.

Good hygiene is fundamental to health, survival, growth and development. Therefore the key to combating poor hygiene practices should include a combination of both hardware and software. In other words the provision of latrines and garbage disposal bins alone are insufficient to address the sanitation and hygiene practices in the island. Education and knowledge must play a vital role if a behavioural change is desired. It is in this regard that these recommendations are proffered.

Recommendations:

Educate on and articulate the importance and critical times for hand washing
Educate on and promote proper hand washing techniques
Educate on which diseases water / sanitation and waste are related
Start education young
Awareness on the fact that the impact extends beyond the limitations of the individual and affects the entire public health of the island
Educate on and promote proper disposal of children's faeces

OVERALL

Water, sanitation, waste and hygiene form a cycle that needs to be complete to improve the resilience of any community. Many aspects of water, sanitation, waste and hygiene are intertwined, both on the level of the problems as on the level of possible solutions:

To increase the sanitation situation of the island, an increase in available water will be necessary

Some sanitation systems actually produce clean water that can be reused for almost any purpose

For a sanitation system to work well, people need to be aware which 'waste' can be thrown in the system

If waste collection bins are emptied regularly and protected from animals, people might start to use them more consistently

Etc.

It might seem on Grand Turk that only some communities/ individuals cannot keep the circle closed and therefore the cause of the problem and the responsibility of solving it lies only with them. This can be contradicted for at least two reasons.

Improper sanitary practices affect a larger area/ section of society than the individuals that practice those activities, increasing risk of environmental degradation and public health problems. Understanding these risks should be commonly shared knowledge.

Solutions depend on a variety of stakeholders that need to buy into it: households themselves can clean their toilets better, people passing by can stop throwing waste out on the street, the limited available water can be shared more equally between people, land owners/ rent collectors can provide better facilities etc.

To increase the resilience of Grand Turk as one community, there is plenty of work to be done by everyone and on every level of the community. These recommendations might enable an increased awareness on the cycle: water/ sanitation/ waste/ hygiene practices and the necessity of enabling the infrastructure to complete that cycle.

The above recommendations can be translated in actions. Different bodies in the society have different ways of operating, different relationships with the various groups and individuals in the society. Red Cross will attempt to translate some of these recommendations into programmes within their scope and means of operating.

Prepared by Dr. V. Clerveaux and K. Boon, 10th October 2009

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