NATIONAL ENVIRONMENT AND PLANNING AGENCY

A SURVEY OF THE KNOWLEDGE, ATTITUDE, PRACTICES AND BEHAVIOUR OF RESIDENTS IN RELATION TO THE ENVIRONMENT IN JAMAICA

FUNDED BY THE TOURISM ENHANCEMENT FUND

UNDER THE TEF/NEPA-2014-001 PROGRAMME

CONDUTED JULY, 2015 – MARCH 2016

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Document : **A SURVEY OF THE KNOWLEDGE, ATTITUDE, PRACTICES AND BEHAVIOUR OF RESIDENTS IN RELATION TO THE ENVIRONMENT IN JAMAICA**

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Edited by Cynthia Vaughan 17 June 2016

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LIST OF ABBREVIATIONS AND ACRONYMS

CFC	Chlorofluorocarbon
DK	Don't Know
ED	Enumeration District
ENGO	Environmental Non-Government Organization
FGD	Focus Group Discussion
GNI	Greatest Negative Impact
IWCAM	Integrating Watershed and Coastal Areas Management
KAPB	Knowledge, Attitudes, Practices and Behaviour
KMA	Kingston Metropolitan Area
LDUC	Land Development and Utilization Commission
NEPA	National Environment and Planning Agency
NRCA	Natural Resources Conservation Authority
NS	Not Sure
NSWMA	National Solid Waste Management Authority
NWC	National Water Commission
ODPEM	Office of Disaster Preparedness and Emergency Management
OT	Other Towns
OUC	Other Urban Centres
PECCB	Public Education and Corporate Communication Branch
PRO	Public Relations Officer
PSU	Primary Sampling Unit
RA	Rural Areas
RADA	Rural Agricultural Development Authority
SSU	Secondary Sampling Unit
STATIN	Statistical Institute of Jamaica
TCPA	Town and Country Planning Authority
USU	Ultimate Sampling Unit

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EXECUTIVE SUMMARY

The National Environment and Planning Agency (NEPA) was established in April 2001 as an Executive Agency, and has, as part of its public education mandate environmental education; which necessitates the planning and implementation of strategies and programmes to inform the public on the Agency's functions as well as the responsibilities of citizens.

The organization has realized that there is limited national empirical data to evaluate the effectiveness of its educational strategies, which would measure important changes in knowledge, attitudes, practices and behaviour, with respect to environmental (including spatial planning), issues.

This study, a comparison in part with the 1998 "*Attitudes to the Environment in Jamaica"* study, was funded by the Tourism Enhancement Fund, and has as its major objectives, to; determine the public's view of NEPA, determine the current status of the public's knowledge, attitudes, practices and behaviour as it relates to the environment, illustrate any changes over the past 17/18 years in the public's knowledge, attitudes and practices as it relates to the environment, and provide an analysis of the effectiveness of the NEPA in carrying out the public education aspect of its mandate and the extent to which that may have had on any changes in the public's knowledge attitudes, practices and behaviour.

Relevant literature has been reviewed and was fed into the development of the study. From the review of the previous (1998) study gaps relating to the study objectives, other organizational, analytical, structural and developmental aspects were highlighted which explain how this 2015/2016 study would bridge those gaps. In relation to other literature reviewed, relating to NEPA's educational programmes, it was discovered that the organization was involved in a number of educational programmes and activities spanning, person-to-person types, local media (print & electronic), project & programme development. Included in the media platforms were traditional, electronic social and emerging entities – local and international. It was concluded that NEPA was involved in a wide range of educational programmes and activities, almost spanning the entire human life cycle; the 0 - 3 age group was the exception.

Methodology

The study is a cross-sectional analytical one, done to some extent as a comparison with the previous study done in 1998.The quantitative aspect was done using a pre-constructed interviewer-administered questionnaire (a modified instrument from the study cited earlier). This questionnaire was pre-tested with approximately twenty (20) persons from communities in selected parishes, utilizing an urban-rural mix. A focus group discussion guide, (for each group), was used to elicit responses in relation to the qualitative aspect of the study.

The sample for the quantitative aspect of the study was done randomly, using data from STATIN, the Government/State Agency responsible for conducting Censuses and Surveys in Jamaica. A national sample of one thousand four hundred and forty (1,440) persons was selected to participate in the study; covering seventy-two (72) Enumeration Districts (EDs), across the island, and all fourteen (14) parishes.

The three sampling domains for this study were, Kingston Metropolitan Area (KMA), other towns (OTs), and rural areas (RAs)

The design for the survey was a multi-stage cluster probability sample, involving the selection of Enumeration Districts (ED), dwelling units and respondents. Persons were chosen to form two separate homogenous groups of between six to twelve persons each, for the qualitative aspect of the study.

The quantitative aspect of the data was analysed using a Statistical Package for the Social Sciences (SPSS). The qualitative aspect was done using Microsoft Excel for coding; and at another level, it was done manually, utilizing Microsoft Word for more detailed analysis.

Twenty-two (22) interviewers were selected and trained in data collection and interview techniques. This was done with the help of the four (4) supervisors who worked on the study, the Consultant, and a representative from STATIN.

Socio-demographic Information

The weighted estimated population was 10,185. The largest proportion of respondents, was from the parish of St Catherine (15.8%), followed by Clarendon (11.4%), St Andrew (10.9%), St James (10.4%) and Westmoreland (8%). The least proportions of respondents were reported from Kingston (1.9%), Portland (3.1%), St Mary (3.4%), St Thomas (3.7%) and Hanover (4.5%).

Most respondents were female (58.5%), compared to males (41.5%). More than 10% of female respondents were from St Catherine (17.3%), St Andrew (11.4%), and Clarendon (10.9%), while more than 10% of male respondents were from St Catherine (13.8%), Clarendon (12.1%), St James (12.1%) and St Andrew (10.5%).

Slightly more than half of the respondents were from the rural areas (52.7%), compared to 34.5% from other towns and 12.8% from the Kingston Metropolitan Area.

More than two-thirds (64.4%) of the respondents were in the age range 25-54 years, with the remainder being;19.6% (45-54yrs), 22.5% (35-44yrs) and 22.3% (25-34yrs). In addition, approximately 7% were 65 years and over, 13.5% (18-24 years), and about 1% of ages were unknown.

About half of the female respondents were distributed in the age range 25-44 years; 24.6% were in the range 25-34yrs, and 24.4% were in the range 35-44yrs. Males were more likely to be in the 25-54 years age range; 19.2% were in the range 25-34yrs, and 20.5% in the range 35-44yrs.

Of the number of respondents in the study, 77.4% indicated that they had several children while 22.2% said that they had only one. Half of one percent (0.5%) did not respond. The overall mean number of children indicated was 2.96. Males reported a slightly higher number of children than females (males with a mean of 3.12 versus females with a mean of 2.86).

A little more than half of the respondents were presently employed (53.7%). Notably, a high proportion of the respondents (45.9%) were unemployed and 0.4% did not respond. The highest level of employment reported was for the parishes of St Catherine (14.6%), St Andrew (13.7%) and St James (12.3%). With respect to unemployment, high proportions were noted for St Catherine, Clarendon and St James.

Some 64.3% of respondents in the KMA reported that they were employed, compared to 50.8% in the other towns and 53.4% in the rural areas. It was shown however, that 52.3% of all employed persons were in the rural areas, while 32.4% were in other towns and 15.3% were in the Kingston Metropolitan Area.

Seven percent (7%) of the respondents who said "yes" they were employed, were in the 18-24yrs range group. Those who said "no" they were unemployed accounted for 21.6%. Among the various age groups, the highest proportion of employment was reported for the 35-44yrs range (28.1%), followed by the 25-34yrs range (25.8%) and the 45-54yrs range with 23.2%.

Most respondents had completed either the secondary/high or technical level (45.1%) or the primary/all age level (25.9%). A notable proportion had completed the tertiary level (university, college, etc.), (14.6%). In addition, 7.6% had completed community college, and 5.5% had completed other level of schooling. Less than half of one percent indicated that they did not attend school and 0.5% indicated that they only completed the basic level of schooling.

Forty-five (45%) percent of respondents were single (not living with anyone). The other highest proportions were; married (26.6%), followed by common-law (living with a partner), (19%). Some 40% of single respondents were employed, as were 31.9% of married respondents. Just over one-fifth (1/5) of common-law respondents were also employed.

Knowledge of the Environment

For the most part the responses in relation to respondents' understanding of the meaning of environment were very varied. The most prevalent response was the "surroundings", which was indicated by 53.4% of respondents. Ten percent (10%) of the respondents indicated that they did not know, and the other notable proportion (9.4%) said that it was understood to be the community.

Other responses were; “everything around us”; “around you”; “atmosphere”; and “keeping surroundings clean”. Almost all of the varied responses were for the most part indicated by less than one percent of respondents. In other words, less than one percent would have indicated “everything around us”; or “around you”; or “atmosphere”; and “keeping surroundings clean” as examples.

The most prevalent responses in relation to respondents’ thinking of the major issues affecting the environment were, garbage disposal (27.3%), pollution (15.2%), and don’t know (6.3%). Responses here were also varied, since it was an open-ended question and included the following: pesticides, plastics, water/water crisis/water pollution, mosquitoes, greenhouse effects, global warming, burning and roads.

With respect to the aspect of Jamaica’s environment that respondents thought was most threatened, the most prevalent responses were; water and water systems (13.3%), air and atmosphere (8.8%), and land 5.8%. Other important aspects of the environment that were mentioned included; beaches, farming, coastlines, fishing industry, garbage collection, seas/sea shores, communities, marine life, wildlife, forests, Riverton city dump, roads, mining, rivers and reefs.

This explains respondents’ ratings of ten items as having tremendous negative effect on the environment.

1. Approximately 22.6% of respondents ranked household garbage at number 10. 9.6% felt that this item had no effect on the environment and 2.5% did not know or were unfamiliar with its effect.

2. Approximately 19 percent (18.7%) of respondents ranked **automobile exhaust** at number 10. however, 12.1% felt that this item had no effect on the environment, and a small proportion (7.3%) did not know or were unfamiliar with its effect.

3. Another 18% of respondents ranked **sewage pollution** at number 10, while 20.1% felt that this item had no effect on the environment, and a small proportion (6.8%) did not know or were unfamiliar with its effect.

4. About 15.1% of respondents ranked **toxic waste** at number 10. 19.9% felt that this item had no effect on the environment and a notable large proportion (19.1%) did not know or were unfamiliar its effect.

5. Only 13.8% of respondents ranked **manufacturing plants/ factories** at number 10, with 21.7% responding that this item had no effect on the environment. A notably large proportion (15.7%) did not know or were unfamiliar with its effect.

6. Approximately 13.3% of respondents ranked the **individual resident** at number 10; however, 20.3% felt that this item had no effect on the environment, and a notable proportion (9.4%) did not know or were unfamiliar with it.

7. Approximately 12.1% of respondents ranked **agriculture's use of pesticides and herbicides** at number 10; however, 22.1% felt that this item had no effect on the environment and a notable proportion (12%) did not know or were unfamiliar with it.

8. A small number of respondents (10.7%), ranked the **mining industry** at number 10; however, 18.4% felt that this item had no effect on the environment and a notably large proportion (18.7%) did not know or were unfamiliar with its effect.

9. Nine (9%) of respondents ranked the **forestry industry** at number 10, while 22.5% felt that this item had no effect on the environment. A notably large proportion (15.5%) did not know or were unfamiliar with its effect.

10. Five point one percent (5.1%) of respondents ranked the **fishing industry** at number 10; however, 28.5% felt that this item had no effect on the environment and a notably large proportion (17.8%) did not know or were unfamiliar with its effect.

The fishing industry (28.5%) was the most prevalent item having the least negative effect on the environment. More than a quarter of respondents felt that this industry had no negative effect on the environment. A little more than one-fifth (1/5) of respondents indicated the forestry industry (22.5%), agriculture's use of insecticide/or pesticides (22.1%), manufacturing plants/ or factories (21.7%), individual residents (20.3%), sewage pollution (20.1%); and toxic waste (19.9%), as having no negative effect on the environment.

In each of five selected items, more than 15% of respondents indicated that they did not know (were unfamiliar) with the impact of each of the five items on the environment. The items were, the fishing industry (17.8%), the forestry industry (15.5%), mining industry (18>7%), manufacturing plants or factories (15.7%), and toxic waste 19.1%.

In response to a question about the greatest negative impact of items on Jamaica's environment, 33% indicated household garbage. Other notable responses were sewage pollution (14.5%) and automotive exhaust (13.7%).

The items identified by the lowest proportion of respondents as having the greatest impact were the fishing industry (1.3%), agriculture's use of insecticide/or pesticides (4.2%), the forestry industry (4.9%) and the mining industry (5.9%).

Notably, more respondents identified household garage as causing the greatest negative impact on the environment in 2015 compared to 1998 and 1991. Almost twice as many persons indicated this in 2015 over 1991 (33% versus 17.6%); however, about 50% more persons felt this way in 2015 compared to 1998 (33% versus 22.5%).

Persons perceptions of automotive exhaust and manufacturing plants/ industrial plants were the only other items on the list that increased (though slightly); - 2.1 percentage points over 1998 for automobile exhaust and 4.1 percentage points over 1998 for manufacturing plants.

The perception of all other items decreased slightly, except in the case of the forestry industry which decreased by 9 percentage points.

This explains respondents rating of ten items as having major or minor contributions to air pollution, or did not contribute at all.

1. Approximately **60%** of respondents felt that **automobile emissions** were major contributors to air pollution, while a little more than one-fifth (23.2%) felt that it was a minor contributor. 9% did not think it contributed to pollution at all. A notable proportion (12.1%) did not know.

2. Fourteen point four percent (14.4%) of respondents felt that the **fishing industry** was a major contributor to air pollution; more than a third (36.7%) felt that it was a minor contributor and a significant proportion (30.9%) did not think it contributed to air pollution at all. A notable proportion (18%) did not know.

3. About three-quarters (74.9**%)** of respondents felt that **burning refuse/rubbish** was a major contributor to air pollution, while 15.6% felt that it was a minor contributor.5.4% did not think that it contributed at all. A notable proportion (4.1%) did not know.

4. About four out of every ten (4**0%**) of respondents felt that **industrial plants** were major contributors to air pollution, while little more than a quarter (25.9%) felt that they were minor contributors. A notable proportion (16%) did not think they contributed to air pollution at all and another notable proportion (18%) did not know.

5. Only 8**%** of respondents felt that **citrus farms** were major contributors to air pollution, while about one-third (32.4%) felt that they were minor contributors. 36% did not think that they contributed to air pollution at all. A notable proportion (23.4%) did not know.

6. Approximately 31**%** of respondents felt that **power- generating plants** were major contributors to air pollution, while a little more than one-quarter (27.7%) felt that they were minor contributors. 19.9% did not think that they contributed to air pollution at all. A notable proportion (21.5%) did not know.

7. Approximately 35**%** of respondents felt that **aerial crop dusting (spraying)** was a major contributor to air pollution, while three in every ten (31.2%) felt that it was a minor contributor. 16.3% did not think it contributed to air pollution at all. A notable proportion (17.5%) did not know.

8. Approximately 33**%** of respondents felt that **quarrying** was a major contributor to air pollution while more than one-quarter (28.5%) felt that it was a minor contributor. 18.2% did not think it contributed to air pollution at all. A notable proportion (20.9%) did not know.

9. Approximately 41**%** of respondents felt that **sewage treatment plants** were major contributors to air pollution; while little more than one-fifth (23.8%) felt that they were minor contributors. 17.6% did not think that they contributed to air pollution at all, while 17.7% did not know.

10. A large proportion, 52% of respondents felt that **sugar estates (cane burning)** were major contributors to air pollution, while 22.7% felt that they were minor contributors. 12.5% did not think that they contributed to air pollution at all. A notable proportion (13.2%) did not know.

For the most part, those respondents from the KMA felt that the major contributors to air pollution were burning refuse/rubbish (86.2%); automobile emission (71%), sewage treatment plants (57.9% and cane burning (54.2%). This was essentially the same pattern indicated by respondents from the other towns and rural areas. In these areas, the most prevalent responses to the major contributors were also burning of refuse, and automobile emissions.

As in 1998, respondents indicated that the fishing industry and citrus farms were "major" contributors to air pollution; however, the proportions indicating automobile emissions as major contributors decreased from 70.4% in 1998 to 55.9% in 2015. Burning of rubbish showed a notable increase in 2015 compared to 1998 (74.9% versus 56.8%). Quarrying was seen less as a major contributor in 2015 compared to 1998, but cane burning remained about the same. The average proportion of respondents (on all ten items), who did not know, was slightly lower in 2015 (16.7%) compared to 1998 (19.9%).

This explains respondents' rating of ten (10) items as having major or minor contributions to air pollution, or did not contribute at all.

1. Approximately 43% of respondents felt that **carbon dioxide** was a major pollutant in motor vehicle exhaust emissions, while 15.4% felt that it was a minor contributor. 6.8% did not think that it contributed at all. A notable high proportion (35.3%) did not know.

2. Approximately 41.8% of respondents felt that **carbon monoxide** was a major pollutant in motor vehicle exhaust emissions, while 13.4% felt that it was a minor contributor. A small proportion (4.9%) did not think that it contributed at all. A notable high proportion (39.9%) did not know.

3. Approximately one-third (33.2%) of respondents felt that **lead** was a major pollutant in motor vehicle exhaust emissions while 15.8% felt that it was a minor contributor. 7% did not think that it contributed at all, however, a notably high proportion (44%) did not know.

4. Approximately 13% of respondents felt that **oxygen** was a major pollutant in motor vehicle exhaust emissions while little more than one-fifth (21.4%) felt that it was a minor contributor. A notable proportion (21.4%) did not think that it contributed at all and another notably high proportion (44.4%) did not know.

5. Approximately one-fifth (20.8%) of respondents felt that **arsenic** was a major pollutant in motor vehicle exhaust emissions while 14.7% felt that it was a minor contributor. 8.4% did not think that it contributed at all. More than a half (56%) of the respondents did not know.

6. Approximately 16.5% of respondents felt that **small particles** were major pollutants in motor vehicle exhaust emissions while a little more than a-quarter (25.9%) felt that they were minor contributors. 8.9% did not think that they contributed at all. A notably high proportion, almost half, (48.7%) did not know.

7. Approximately 14% of respondents felt that **tin** was a major pollutant in motor vehicle exhaust emissions while one-fifth (20.6%) felt that it was a minor contributor. 10.6% did not think that it contributed at all. More than a half (54.4%) of respondents did not know.

8. Approximately 22% of respondents felt that **sulphur oxides** were major pollutants in motor vehicle exhaust emissions while 14.4% felt that they were minor contributors. 8.8% did not think that they contributed to motor vehicle emissions at all. More than one-half (54.5%) did not know.

9. Approximately 21% of respondents felt that **nitrogen oxides** were major pollutants in motor vehicle exhaust emissions, while 14.8% felt that they were minor contributors 8.1% did not think that they contributed at all. More than one-half (56.3%) of the respondents did not know.

10. Approximately 17% of respondents felt that **iron oxides** were major pollutants in motor vehicle exhaust emissions while 13.9% felt that they were minor contributors. 8.1% did not think that they contributed to motor vehicle emissions at all. Six of every ten respondents (60.9%) did not know.

For the most part, respondents only identified carbon dioxide, carbon monoxide and lead as the major pollutants in motor vehicle exhaust emissions. A significantly high proportion of respondents (40-60%) did not know/could not identify eight of the ten items as being pollutants in motor vehicle exhaust emissions.

An even higher proportion of respondents in 2015 identified the four (4) items that were not pollutants in exhaust emissions, when compared to 1998; however, for those correctly identified as major pollutants, a slightly higher proportion of respondents in 2015 identified carbon dioxide, carbon monoxide, sulphur oxide and nitrogen oxides as major pollutants. When the correct responses only are considered, a considerably high proportion of respondents continue to indicate that they do not know which items are pollutants in motor vehicle exhaust emissions. The average proportion of responses of 'don't know' decreased slightly from 56% in 1998 to 47% in 2015.

Quite notably a number of respondents in each case felt that; littering (75%), lack of rainfall (66.9%), deforestation (54.2%), pit latrine (53,6%), too many housing schemes (28.7), industrial effluent discharge (50%), fish farming (15%), soak-away pits (50%), use of pesticides by farmers (43%), sewage treatment plants (47%), and population increase (36.9%), negatively affected the **quality** of Freshwater for drinking.

Respondents were asked to indicate which items negatively affected the **quantity** of Freshwater for drinking. The responses were, littering (55.5%), lack of rainfall (84.9), deforestation (59.85), pit latrines (35%), too many housing schemes (39.6%), industrial effluent discharge (32.1%), fish farming (14.7%), soak-away pits (33.5%), use of pesticides by farmers (25.6%), sewage treatment plants (32%), population increase (48%) and lack of water storage capacity (67.4%).

About four out of every ten respondents (43.1%) said that they have enough information on actions they could take to help protect the environment, while a little more than a quarter (26.4%) said 'no', and 29.6% were not sure.

Significantly less respondents in 2015 said that they had enough information on actions that they could personally take to help protect the environment.
There was an 18-percentage point decrease compared to 1998 in persons who said "yes", they had enough information.

In 2015, those who said "no" and "not sure" were combined and it showed that some 57% of respondents felt that they did not have enough information. This compared to 52% in 1991 and 35% in 1998.

Attitude to the Environment

Four of every ten respondents (40%) said that they were 'extremely concerned' about the environment about one-fifth (20.9%) were quite concerned, 14.7% had some concern and 4.4% had no concern. Males were not dissimilar to females with respect to their concern for the environment (same pattern as for the overall responses). When cross-tabulated by location, the same pattern emerged. Regardless of location, most respondents were extremely concerned and the proportion decreased as the level of concern decreased

Concern for the environment significantly increased in 2015 compared to the other two periods. The level of unconcern for the environment decreased by 12 percentage points over 1998. Those who were concerned showed less marked decreased in that the decrease was only about 7 percentage points over 1998. The most significant result was the 22-percentage point increase among those who were quite extremely concerned.

In relation to "concern for the environment over the past five years," about four of every ten respondents (39.8%) said that their concern had increased significantly, about 30% of

respondents concerns had increased somewhat/a little, 23% remained the same, 4.9% had decreased somewhat/a little, and 2.6% said that it had decreased significantly

Most males as well as females indicated that their concerns had increased significantly over the past five years, (42.5% for males versus 38.2% females). The number of both males and female decreased proportionally as the level of concerns decreased.

Concerns for the environment over the past five years have increased significantly in 2015 compared to 1998(a 33-percentage point increase). The proportion of respondents who indicated that their concerns remained the same were notably less in 2015 compared to 1998 (23% versus 54.4%), while those who said their concerns decreased, showed a slight increase in 2015 (7.5% versus 5.6 %.)

Slightly more than a third of respondents (34.8%) said that they could have "some effect" on protecting the environment. About a quarter (24.7%) felt that they could have an "extremely large effect", while 23.2% felt that it could be a "large effect". About 13% felt that individuals could have "very little effect" and 4.1% felt that they could have "no effect".

Most males as well as females indicated that an individual would have only some effect in protecting the environment (31% and 37% respectively); however, more males (29.3%) compared to females (21.5%) felt that one could have an extremely large effect. They were not dissimilar for the other categories.

Regardless of the location, most respondents felt that individuals would only have some effect (37.7% for respondents from KMA, 39.1% for respondents from other towns and 31% for respondents from rural areas). The other proportional responses were similar to the pattern for the overall responses.

In 1991, only 7% felt that individuals like themselves could have an extremely large effect in protecting the environment, and only 19% felt that they could have quite a large effect. In 1998

however, this increased to 11.3% for extremely large effect but remained the same for a large effect. In 2015, there was a significant increase in the proportion of respondents who felt that they could have an extremely large effect in protecting the environment (14-percentage point increase over 1998). Those who felt they would have very little effect decreased markedly in 2015 compared to 1998; from 23% to 13%). Overall, significantly more individuals in 2015 felt that they could have some kind of effect in protecting the environment, than individuals did in both 1998 and 1991.

In response to the environment's importance to their quality of life, 58.4% of respondents indicated that they "strongly agreed" that the state of the environment was important to the quality of their lives. About 32% "agreed" and a small proportion (7.5%) were neutral. Only 2.6% "disagreed" with the statement. Males were as likely as females to strongly agree with the statement and a higher proportion of respondents in all three locations strongly agreed with the statement.

Less than three percent of respondents overall or among males and females or within the three locations disagreed (disagree or strongly disagree) with the statement.

In relation to the statements 'willingness to take part in community tree planting'; 83% said "yes", 'willingness to join an organization dedicated to protecting the environment' 79.1% indicated "yes", 'willingness to plant a seedling in the community' 90% responded "yes", 'willingness to care for the young seedlings planted' 92.7% responded "yes", and 'willingness to participate in recycling programmes', 84.5% indicated "yes".

About six of every ten respondents (61.7%) felt that there was something they could do to help protect the environment. A significantly large proportion was unsure (32.4%). This was the same pattern for both male and female respondents.

With respect to changing their lifestyle in any way to help protect the environment, 66.5% said "yes", while a small proportion said no (3.1%); however, more than a quarter (26.3%) said "probably" (yes) and only about 4% said they did not know. This was the same pattern

observed for both male and female respondents; 68.5% of males said “yes” compared to 65.5% of females. Slightly more females said “probably” (27%) however, compared to males (25%).

In 1991, about 62% of the sample said that they were willing to change to a more environmentally friendly lifestyle, 17% said that they might; and 8% flatly said that they were unwilling. In 1998 there was a decrease to 56% in those that were willing, but in 2015 there was an increase to 67%, an 11-percentage point increase.

The percentage of persons who were flatly unwilling notably decreased in 2015 from 7% in 1998 to 3% in 2015.

Practices in the Environment

In relation to environmentally appropriate methods for residents to dispose of their garbage, 33.6% said “none of the above”, - which was either burning, burying, throw in gully or open lot; 33.7% indicated burying; 28.8% said burning while 1.4% said “throw in gully”; and 2.5% said “throw in open lot”. More females (36%) compared to males 30.3%) said burying, but more males opted for “none of the above” and burning. Respondents in the KMA were more likely to indicate “none of the above” (46.7%) or burying (36.1%) as were respondents in the other towns and rural areas.

Significantly fewer respondents indicated that they would burn their household garbage in 2015 compared to 1998, a 25 percentage point decrease. This was also the same pattern for burying garbage, a 32-percentage point decrease. For those who said that they would not burn, bury, throw in gully or throw in open lot, there was a notable shift of 22 percentage points. A larger proportion of respondents in 2015 indicated that they would use “none of the above”.

With respect to the usual method of disposing of household garbage, most respondents overall indicated that they did not separate it, but put it out to be collected by the garbage truck (47.3%). This was followed by burning (27.8%) and separation then putting up to be collected

by the truck (16.7%). About 6% indicated “burying”, 1.2% “throw in the gully” and another 1.2% used some other method. Table 27 refers.

Females were as likely as males to indicate that they did not separate but put up garbage to be collected by the garbage truck (47.3% and 47.5% respectively), or that they burnt their garbage (28.55 and 26.8% respectively). Burning was significantly more likely to be reported by respondents in the rural areas compared to the other two locations; however, respondents in the KMA were significantly more likely to indicate that they did not separate but put up garbage to be collected by the garbage truck.

In relation to personal actions taken to protect the environment, the most prevalent responses of “yes” (greater than 35%) were for; “I try to use less electricity” (64.4%), “I have planted trees (41.1%), “I return glass bottles whenever possible (37.7%). Apart from 22.7% indicating that, “I burn my garbage”, less than 20% of respondents answered “yes” to the remaining items.

Respondents were asked to indicate what they had been involved with or done recently in relation to protecting the environment**.** For the most part, respondents could not identify with any of the options given and indicated “none of the above” (41.6% of the times); however, 22.6% indicated: “I have read an article/s to help me become more environmentally **aware”.** Small proportions indicated joining an organization that was involved with the environment (5.9%), or shared information about the environment on social media (7.7%). About 9% said that they supported an organization involved with the environment.

In relation to actions taken within the past week that were considered helpful to the environment, the most prevalent responses of “yes” greater than 10% were; “I try to use less electricity” (60%), “I have planted trees” (20%), “I return glass bottles whenever possible” (17.9%), and “I burn my garbage” (14.6%). Less than 10% (0.8-9.4%) of respondents answered “yes” to the remaining items.

With respect to actions taken within the past week that were considered **dangerous** to the environment, the most prevalent responses of "yes" greater than 10% were; "I burn my garbage" (30.3%), "I burn cutting and grass from the yard" (19%)," I burn plastic" (2.9), "I do not necessarily use biodegradable products" (11%). Less than 10% (0.5-9.1%) of respondents answered "yes" to the remaining items.

Perception of NEPA

In relation to respondents naming the Government Agency that had the major responsibility for the environment in Jamaica; 58.7% said yes. Those who said yes, 52.4%, identified NEPA as the responsible Agency. With respect to them hearing of NEPA, before the day of the interview, 72.8% said "yes", 16.3% said "no", and 10.8% said they could not remember.

Sixty-eight percent (68%) of the times respondents identified 'protecting the environment' as work done by NEPA. The next most prevalent response was 'pollution prevention and control' (indicated 43.8% if the times). For 39% of the times, respondents said that NEPA's work was to "conduct public education/educate people about the environment'. Females were as likely to indicate protecting the environment as the most prevalent response as did respondents from three locations. More females (9.7% compared to males (5.6%) indicated that they did not know what NEPA did. Comparison by location indicated that respondents from the KMA were least likely to indicate that they did not know what NEPA did, (KMA (7%), other towns (8.3%) and rural areas (8.2%).

With respect to respondents hearing or seeing something about NEPA, 65.8% said yes they had seen or heard about NEPA and its work within the past year; 69% of males versus 63% of females. About 18% said that they had not heard or seen anything and 16% could not remember such. 70.1% of respondents in the KMA had seen or heard something about NEPA compared to 61.8% in other towns and 67.1% in the rural areas. Those respondents, who had heard or seen something about NEPA, were asked to identify as many things from a list indicating what they would have heard or seen. For the most part, what was most often identified were news items on TV (45.6% of the times); advertisements on TV/Radio (19.6%); educational programmes on TV/Radio (16.9%); and public service announcements on TV/Radio (11%).

Respondents were asked to give their impression of NEPA with respect to its role in protecting the environment. Fifty-two point seven percent (52.7%) of respondents felt that NEPA was doing a good job in this regard; 16% said “no” and 31.5% were unsure.

When asked whether NEPA was doing a good job in educating/ or informing the Jamaican public about the environment, only 47% agreed (said “yes”) while more than one-fifth (23.1%) said “no” and 29.9% were unsure. Sixty point eight percent (60.8%) overall felt that NEPA could do more to help protect the environment, 6.5% said “no”, and 32.7% were unsure.

NEPA’s Public Education Programmes and Activities

Respondents were asked if they were aware of (heard of, or knew about) any of the following events, and if so had they ever participated in any of them. For the most part respondents were aware of all events mentioned. More respondents were aware of the International Ozone Day /Clean- Up Day (52.3%) than any other event. The next most prevalent event identified was National Environmental Awareness Week (43.4%), followed by World Wildlife Day (20.3%) and the Annual NEPA Display at Denbigh (21%). Although more than 20% of respondents were aware of the key events mentioned earlier, only 2-6% had ever participated in these events. Very low participation was indicated for these events overall 1.1-6.7%.

Respondents were also asked if they were aware of (**heard of or know about**) any of the indicated media through which NEPA offered educational and other services to the public; and if so had they ever used any of those services. Most respondents were aware of the website (33.0%), Facebook (27.5%) and Library (22.5%, as media through which information was disseminated by NEPA.

The most prevalent media identified by respondents, as being used were Website, Facebook, You Tube and to a lesser extent Twitter and Instagram. The overall usage pattern indicated was very low (2.5-13.5%).

From the focus group findings, participants indicated learning very valuable lessons. For the students at Mico Primary and Junior High School, lessons were learnt from their participation in the recycling aspect of the project, field trip to Port Royal, the vegetable garden and the

compost activity. In relation to the focus group discussion (FGD) in Portland, lessons were learnt in relation to being committee members of the various project committees, the general environment, the team spirit and community wellbeing.

In relation to the usefulness of these projects, schools, individuals, communities and Jamaica on a whole have benefitted socially, educationally/intellectually and economically, among other aspects, from the various exercises undertaken in both groups.

Participants, as a result of the learning which has taken place, have improved their knowledge and skills greatly, and have changed their attitudes and behaviours in a positive way. In both discussions, participants expressed the idea of seeing the continuation of those projects or others of a similar nature.

RECOMMENDATIONS

Knowledge of the Environment

1. In relation to the fact that there are a few grey areas as to the meaning of the environment, NEPA's definition of the environment should be a reinforcing factor and should be looked at in this situation.

2. More sustained focus should be placed on the importance of the varied aspects of the environment as garbage disposal always came out as the most important aspect. For example, the fishing industry was seen as not necessarily that important.

3. In relation to respondents' relatively low knowledge of the role of auto emissions as major air pollutants, it is recommended that work be done with;
   a. Transport-related entities, like the Transport Authority
   b. The Police; especially the Traffic Division
   c. Other important Government Entities (especially the Transport Divisions).
   d. Community/other organizations

4. The role of the main water Agency and related Government Entities/Ministries should be incorporated into educational programmes and activities to improve knowledge re the importance of the quality of our Freshwater for drinking.

5. In relation to respondents' confessions that they had inadequate information on actions they could take to help protect the environment, one recommendation here is to provide more avenues for the population to be recipients of relevant and accurate information, bearing the various age groups in mind.
6. Generally, those with limited or no knowledge of the environment and its related effects/concerns must be targeted with the aim to improve their knowledge. All aspects of the media could be used to reach them; however, the multiplicity of other sources and strategies should not be overlooked.

Attitudes to the Environment

7. The positive attitudes in relation to respondents' concern for the environment, and their beliefs that they could have some kind of effect on the environment, is a significant gain which should be encouraged and continued.

8. One way to instil a sense of pride for the environment in citizens is to allow them to participate in its development & protection. One approach could be to allow them to engage in tree planting/tree maintaining exercises. For this to be effective, it must be done in a sustained & continuous manner; not ad hoc. This could be done in conjunction with agricultural entities; both Governmental & Non-Governmental.

9. For those who are unsure as to what to do to help protect the environment, and for those who are "sitting on the fence", a concerted effort must be made to 'move', (as the educational process can be considered as a "mental movement") that segment of the population. More targeted efforts must be made to change that level of indecision to a more positive outcome. Expert analyses on the issue should be employed to make the desired results positive. To change attitudes is not an easy task and must certainly be borne in mind in the design of any intervention.

Practices in the Environment

10. . People, without adequate resources in relation to garbage disposal, will find some way to get rid of it. Unacceptable means are usually employed. This underscores the need for serious consideration. There is the opportunity for a multi-sectoral approach to solving this enormous problem, by way of the NSWMA, NEPA, and their related Ministry/ies, other related organizations, and communities.

    Positive behavioural change can be a reality with the dedicated and sustained efforts of those partners.

11. The implementation of recycling projects and programmes would encourage citizens to recycle plastic. It should be borne in mind that people will engage in positive behaviours if they see the benefits to them.

12. It is recommended that NEPA in its quest to encourage communities around the island to participate in positive environmental actions, targets those community organizations in more concerted ways.

    One useful strategy could be to allow communities to participate in targeted environmental projects. Another could be to form environmental clubs or streamline environmental programmes/ projects activities through existing community organizations.

Perception of NEPA

13. It may be a useful idea to consider more localized NEPA branches in selected parish capitals or selected towns to help spread the impact of NEPA on the island. On the other hand, it may be more useful and practical to upgrade the resources (man, money, materials & equipment) of existing similar entities towards the same end.

Generally, it is important to note that in effecting changes in relation to knowledge, attitudes, practices and behaviour, the programmes and projects, approaches and strategies used must be looked at from a holistic perspective, and should be comprehensive in nature.

NEPA's Public Education Programmes and Activities

14. The development and implementation of sustained targeted educational programmes utilizing commemorative events as part of the mix is very important. Commemorative events however, that are a part of a larger continuous/ sustained programme will have greater effect on citizens.

15. In relation to the low usage pattern of NEPA's media services, some creative ways have to be found to allow persons to utilize those services, mentioned. A strategy such as special promotions is useful. Additionally, a focus could be designed and disseminated at the annual NEPA's Denbigh display, as well as at other commemorative events. Focus should be on designing programmes and interventions with a view to increasing the usage.

16. It would be useful to target select groups and organizations within communities in order to create greater focus on environmental issues. In a similar way, the focus on educational institutions will prove to be very beneficial.

17. Finally, it is strongly recommended that another study be designed in order to provide more insights into the educational approaches implemented by the PECCB, and the impact of those approaches on particular segments of the population. That study should be dedicated solely to the PECCB's programmes/projects and activities.

SECTION ONE

INTRODUCTION AND BACKGROUND

The National Environment and Planning Agency (NEPA) was established in April 2001 as an Executive Agency under the Executive Agencies Act. NEPA was founded to carry out the technical (functional) and administrative mandate of three statutory bodies, namely, "the Natural Resources & Conservation Authority (NRCA), the Town & Country Planning Authority (TCPA), and the Land Development & Utilization Commission (LDUC)"

Included in its public education mandate is environmental education, which necessitates the planning and implementation of strategies and programmes to inform the public on the Agency's functions as well as the responsibilities of citizens. The strategies support public participation, which is central to achieving sustainable development and have resulted in the implementation of a number of environmental education campaigns.

There is limited national empirical data to evaluate the effectiveness of the campaigns or more importantly changes in knowledge, attitudes, practices and behaviour with respect to environmental, including spatial planning, issues.

This study was funded by the Tourism Enhancement Fund under the **TEF/NEPA-2014 Programme,** as approved by the Ministry of Finance in September 2014.

The management team responsible for the successful implementation of the project was comprised of the following personnel:

Mr. Michael Kington – Consultant, FGD Moderator & Qualitative Data Analyser
Dr. Ken Garfield Douglas – Quantitative Data Analyser
Mrs. Dawn Walters – Co-moderator of FGD, Supervisor, South East Region
Mrs. Diana Johnson – Supervisor, Southern Region
Mr. Gerald Miller- Supervisor, Western Region
Mr. Damion Scott – Supervisor, North East Region

Project Goals and Objectives

The project seeks to carry out an island-wide KAP survey on environmental and spatial planning issues, and on NEPA as an organization. The survey compares the findings with that of the KAP study done in 1998.

The information and analyses will feed into NEPA's future policies, plans, programmes and projects that are geared at improving protection of the natural environment, natural resources management and spatial planning in Jamaica; including public education and corporate communication campaigns with the end goal of improved public knowledge, attitudes and practices regarding environmental issues.

The objectives of the survey were to:

1. Determine the public's view of NEPA.
2. Determine the current status of the public's knowledge, attitudes and practices in relation to the environment.
3. Illustrate any changes over the past seventeen (17) years in the public's knowledge, attitudes and practices as it relates to the environment.
4. Provide an analysis of the effectiveness of the NEPA in carrying out the public education aspect of its mandate and the extent that this may have had on any changes in the public's knowledge, attitudes, practices and behaviour.

Review of Literature

A. The 1998 NEPA KAP Study – Limitations & Gaps

This review is done in response to a proposal by NEPA to do a survey, the major goal of which is to "carry out an island-wide KAP survey on environmental and spatial planning issues, and NEPA as an organization". As is explained in the TOR the survey will compare findings with that of the 1998 KAP survey and this in turn will feed into NEPA's future plans.

The 1998 survey, entitled, "Attitudes to the Environment in Jamaica", was done on behalf of the Natural Resources Conservation Authority (NRCA) and funded by the Environmental Action Programme (ENACT), a joint effort of the Government of Jamaica and Canada. It had as its

objective, "***To design and conduct a survey … to ascertain the current attitudes and perceptions of Jamaicans towards the environment".***

The study has nine (9) major Divisions or Chapters – Introduction, Local Environmental Issues, Global Environmental Issues, The Effectiveness of the Government, Environmentally Friendly Behaviour, Special Topics - Air Pollution, Water Pollution, Garbage Disposal, & the Big Choice, Public Education and the media, and Conclusions and Recommendations.

The first observation that is to be made is that the 1998 survey seemed a bit ambiguous. The five (5) areas tabulated below would seem to suggest that state:

1. The study is entitled, "**Attitudes** to the Environment in Jamaica".
2. The sole objective focused on was, "… to ascertain current **attitudes and perceptions** of Jamaicans towards the environment".
3. The data collection instrument is entitled, "Survey on Environmental **Awareness and Attitudes** in Jamaica 1997".
4. The introductory remarks on the front of the questionnaire in part reads, "… I would like to ask you a few questions on your **knowledge and attitudes** to the environment".
5. A close glance at the analysis, shows, in addition to other areas, that **practices**, to some degree were included but not stated in any objective.

So, attitudes, awareness, perceptions, knowledge and practices were all part of the study but were not accounted for in the objectives at the beginning of the study, which suggests that, specific, measurable, coherent and well-articulated objectives seem to be absent as a basic guiding principle.

One would agree that this situation lends some degree of confusion to the process of understanding the real objectives of the study. These would certainly allow for more specific variables to study. Some of the variables studied had no bearing on knowledge, attitudes or practices in Jamaica.

In light of the above situation, one should note the variables of observation in the study, as tabulated below (not including socio-demographic variables); and that those variables were also, not driven by the objectives:

1. **Local Environmental Issues – Chapter 3**
    - Understanding about the Environment
    - Levels of concern about the environment
    - Changes in the levels of concern about the environment
    - The major issues facing the Jamaican environment
    - Other issues facing the Jamaican environment
    - The full list of issues facing the Jamaican environment
    - Most threatened aspects of Jamaica's environment
    - Sources of negative impact on the Jamaican environment
    - Most negative impacts on the Jamaican environment
    - Index of awareness about the Jamaican environment
    - Environmental concerns compared to other national concerns
    - Awareness of Jamaican Environmental NGO's

2. **Global Environmental Issues – Chapter 4**
    - Major problems facing the world's environment
    - Sources of negative impacts on the world environment
    - Greatest threats to the world environment
    - Awareness index for the world environment

3. **Effectiveness of the Government – Chapter 5**
    - Government effectiveness index
    - Knowledge about the Government

4. **Environmentally-Friendly Behaviour – Chapter 6**
    - The effectiveness of individual actions

- Environmental actions taken by individuals
- Index of individual environmental activity
- The need for environmental education
- Consumer goods and the environment
- Harming the environment
- Willingness to change lifestyles

5. **Special Topics: Air Pollution, Water Pollution, Garbage Disposal, And the Big Choice – Chapter 7**
   - Air pollution
   - Water pollution
   - The disposal of domestic garbage where there is no collection
   - The choice between economic development and the environment

6. **Public Education and the Media – Chapter 8**
   - The print media
   - Television
   - Radio
   - Overall media reach.

Also to be noted in relation to the above, is that the variables are too numerous, and some are in no way related to the original intent of the study. The 1998 study did not measure the effectiveness of any educational initiative in relation to NRCAs public education mandate to effect changes in the public's knowledge, attitudes and practices. It focused on, "…*the habits of the sample with respect to the print media as well as radio and television",* as can be found on page 84 of the study. That aspect of the study focused on media reach. A section of this 2015 study did examine some aspects of NEPA's educational initiatives.

Another area of importance is that the 1998 study did not include any qualitative dimension to its execution, as a separate component, although qualitative responses came out in the

questionnaire. In this 2015 study a separate qualitative aspect and a focus group discussion, will be conducted.

The study instrument is of vital importance in any study; however, it had too many open-ended questions. These can prove laborious to code and analyse, and can be seen in some of the responses recorded on selective tables in the analysis. Some of the large tables are examples of time-consuming efforts to capture every response. Table 6.2, entitled, *"Most Recent Thing You Did Which You Considered Helped to Protect the Environment, Jamaica 1991, 1998",* is an example. Carefully constructed closed ended questions can generate quality information for a study as important as this.

Another concern about the instrument is that some questions could be rearranged/re-constructed. Question 32 for example, which called for persons to rank a series of eight items/concerns, seemed to be unreasonable. Were it a self-administered questionnaire it would be a more reasonable requirement, but very difficult for an interview-administered questionnaire.

In the 1998 survey, each interviewer was instructed to obtain twenty (20) respondents from selected Enumeration Districts (ED) in all parishes, in age groups that could be seen on Table 1.2 of the study report. The writer here is not clear as to how the interviewers randomly selected persons to be interviewed in any particular ED, without adding some kind of bias to their selections. It may have been done, but that information is not included in the study.

The study, of course has very valuable information in relation to expected study objectives. These include; levels of concern for the environment, major issues facing the Jamaican environment, most threatened aspects of the Jamaican environment, most negative impacts on the Jamaican environment, sources of negative impacts on the Jamaican environment, environmental actions taken by individuals, willingness to change lifestyles, and knowledge about special topics. Generally, the study could be better organized in relation to the objectives, variables selected, question construction and the general focus. Table 1 summarises the gaps and explains how they were being closed in this study.

Table 1: Summary of Gaps in the 1998 Study, & how closed in the 2015 Study

Gaps in 1998 Survey	How they were closed in the 2015 Survey
Objectives unclear – All were not explained at the beginning of study; bits and pieces were picked up all over the study.	Clear, concise objectives – a common thread running through the study and this was clearly articulated at the beginning.
One has to search the study to understand that knowledge, attitudes, & practices were being studied.	Precise and clear from the outset of this study. To be found in the relevant sections.
Some variables in this study were not driven by objectives. Two examples are, "*Global Environmental Issues" & "Effectiveness of Government"*	Only variables of concern (*related to knowledge, attitudes, practices/behaviour, perception of NEPA, & effectiveness of NEPA's educational initiatives*) were articulated in this study & were driven by previously stated objectives
No focus on effectiveness of NRCA's educational initiatives was done	Focus on effectiveness of NEPA's educational initiatives was done – *(no comparison could be made between the two in this respect)*
No qualitative aspect to this study	Two focus group discussions were done in this study
Too many open-ended questions on questionnaire	Much fewer open-ended questions were included
Question 32 called for interviewees to rank a series of 8 items, making it hard for them to remember the items in an interviewer-administered questionnaire.	The question was re-arranged for each item to be focused on individually.
Not clear how interviewers randomly selected interviewees in each ED for the study.	Selection of interviewees in the ED was articulated in this study with utilization of STATIN's expertise. ***See Appendix 11 for the complete process.***

B. NEPA's Public Education Programmes & Activities

From the perusal of reports – hard and soft (printed materials, Internet, Compact Disc), spanning from 1998 to 2014, information gleaned revealed that the Public Education and Corporate Communication Branch (PECCB) of NEPA has been engaged in many, varied and sustained educational programmes and activities targeting children, adolescents and adults in various settings. Activities came generally under the following categories:

1. Research – baseline surveys, community & other surveys.

2. Media Communication/Management/Mass Media Ads. – These involved new, old and emerging media apparatus/entities, and covered electronic, print, cell phones, social media/emails.
3. Special calendar events/commemorative events
4. Development of educational materials
5. Community outreach
6. Activities at educational institutions – from kindergarten to tertiary levels of educational institutions
7. Inter-sectoral collaboration
8. Targeted work with Government, Non-Governmental and other organizations
9. Targeted work at documentation centre/unit
10. Other targeted educational activities

Regular commemorative activities that spread across the calendar annually are listed below:

1. Earth Day
2. National Environmental Awareness Week
3. The International Coastal Clean-up Day
4. International Ozone Day
5. World Town Planning Day
6. World Wetlands Day
7. World Water Day
8. International Day for Biodiversity
9. International Coastal Clean-up Day
10. Annual Denbigh Display

Regular programmes and activities have been planned annually in all of the above areas, with special emphasis on the annual Denbigh display. A major focus of this activity has been to showcase/promote the NEPA brand, and to raise environmental awareness and improve knowledge.

The Documentation Centre Unit has been integrally involved in reaching the public. Over the past two years, among other things, it has served 268 clients who visited the library directly,

processed 23,450 clients' needs via emails, and responded to 597 clients in relation to supplying information and dealing with enquiries, via the telephone.

A closer examination of the records at the Unit showed the following in relation to the type of persons who utilized the services there:

1. Primary school users
2. Secondary school users
3. Tertiary users
4. Researchers – tertiary level
5. Consultants
6. Organizations/institutions
7. Other professionals

Four (4) of the number of public education campaigns that have been executed, are listed below:

1. Game Bird Hunting Season Communication Campaign
2. An Anti-pollution Public Awareness Programme/Campaign developed (clean air, clean water, cleaner technologies, marine litter)
3. Crocodile Campaign
4. World Environment Day "It Haffi Legal"

It should be noted that some public education campaigns have been incorporated into the various activities undertaken during the implementation of some of those commemorative events enumerated earlier. In relation to the Social Media, as was reported by the Public Relations Officer, two (2) platforms existed up to June 2012 – Twitter and Facebook.

The level of engagement she reported saw Facebook with 527 followers and Twitter with 800 followers. She further reported the following below:

"NEPA has since increased its reach by adding Instagram to the Social Media mix so as to reach an even wider audience. A strategy was also developed regarding the management of the Agency's social media accounts to ensure that the highest quality of interesting and educational content is uploaded on a regular basis. Steps were taken to equip the Public Relations Officer with a smart phone to enable the updating of the social media pages in real time.

"As at August 20, 2015, NEPA has 1,365 followers on Facebook, 2,156 followers on Twitter and 375 followers on Instagram".

The number of followers for LinkedIn, Flickr, has not been reported; neither has the number of visits to NEPA's website. Below are four (4) listed YouTube features and the number of reviews for each as of August 31, 2015:

1. NEPA's Television Feature – 740 views
2. NEPA's Application Centre – 753 views
3. Ozone depleting Substances – 311 views
4. Beach Access in Jamaica (Parts 1, 2 & 3) – 455 views

The "Pickney Ting' website is another feature of special significance in relation to public education. Below is an excerpt from that website:

"Pickney Ting" *is geared towards improving the environmental knowledge of children between the ages of 4 and 12 years. It represents the combined efforts of the Public Education & Corporate Communication Branch of NEPA which has direct responsibility for educating the Jamaican public about environmental stewardship"*

*"With this in mind, NEPA felt that there was a genuine need to involve children in environment-related activities and issues. We thought that "**Pickney Ting"** would be a good medium through which to get the attention of the youngsters, whose early knowledge of the importance of environmental stewardship/protection is critical to the advancement of sustainable development".*

Visitors to the "Pickney Ting" website from its inception in October 26, 2005 to the present, August 31, 2015 is, 1,402.

It is safe to conclude that NEPA is involved in a wide range of educational programmes and activities, almost spanning the entire human life cycle, except for the 0 -3 age group. This situation may definitely have some implications for the citizens' knowledge, attitudes, practices and behaviour, their perception of NEPA, and may have influenced in varied ways some of the findings in this study.

SECTION TWO

STUDY METHODOLOGY

The assignment in question is a knowledge, attitude, practices and behaviour (KAPB) study that explains the public's perception of NEPA, their knowledge, attitudes, practices and behaviour in relation to the environment, and whether or not NEPA"s public education programmes and activities have had any effect/impact on the public's behaviour. The study also compares the findings, to some extent, with that of the 1998 study entitled, "Attitudes to the Environment in Jamaica 1998".

This study was conducted from July 7, 2015 to March 20, 2016. Data was collected from October 14, 2015 to December 11, 2015.

Research Design

The study is a cross-sectional analytical one, done to some extent as a comparison to the previous study cited earlier. The quantitative aspect, which is larger in terms of numbers of participants, was done using a pre-constructed interviewer-administered questionnaire. In respect of the qualitative aspect of the study, a focus group discussion guide, for each group, was used to elicit responses.

Sampling

The sample for the quantitative aspect of the study was done randomly, using information from STATIN, the Government/State Agency responsible for conducting censuses and surveys in Jamaica (***See Appendix 28 for a complete explanation of the process)***.

A national sample of one thousand four hundred and forty (1,440) was selected to participate in the study, covering 72 divisions called Enumeration Districts (ED), randomly selecting 20 households from each division across the island - covering all fourteen parishes and reflecting a rural/urban mix; however, only 55 of the selected 72 EDs had been surveyed. See explanation on the limitations of the study. The Table that follows explains the sample breakout:

Table 2: Un-weighted Sample

ED	Parish	No.	Percent	ED	Parish	No.	Percent
C 49*	Kingston	-	-	S 19	Trelawny	20	2.0
C 69	"	20	2.0	C 3	St. James	20	2.o
E 2*	"	-	-	S 22	"	20	2.0
E 57	"	20	2.0	WC 57	"	19	1.9
W 25*	"	-	-	E 57	Hanover	20	2.0
W 55*	"	-	-	W 15	"	20	2.0
E 32	St. Andrew	16	1.6	W 77	"	19	1.9
E 34	"	20	2.0	C 45	Westd.	20	2.0
ER 92	"	20	2.0	W 2	"	20	2.0
NC 12*	"	-	-	W 99	"	20	2.0
NC 24*	"	-	-	NE 77	ST. Eliz.	20	2.0
NC 58*	"	-	-	NW 64	"	20	2.0
NE 53	"	20	2.0	SE 8	"	20	2.0
NE 9*	"	-	-	C 79	Manchester	20	2.0
NW 113*	"	-	-	NW 85	"	20	2.0
NW 15	"	20	2.0	S 49	"	20	2.0
S 27*	"	-	-	N 63	Clarendon	20	2.0
S 46	"	20	2.0	SE 45	"	20	2.0
S 5*	"	-	-	SE 53	"	20	2.0
SE 26	"	20	2.0	SE 72	"	20	2.0
SW 61*	"	-	-	SW 35	"	20	2.0
W 34*	"	-	-	C 12	St. Catherine	20	2.0
W 63	"	1	0.1	C 44*	"	-	-
WC 25*	"	-	-	C 45	"	7	0.7

W 102	St. Thomas	20	2.0	C 55	"	20	2.0
W 109	"	20	2.0	E 21	"	20	2.0
E 108	Portland	20	2.0	E 58	"	20	2.0
E 23	"	7	.7	EC 53	"	20	2.0
W 45*	"	-	-	NC 28	"	20	2.0
C 53	St. Mary	10	1.0	NC 35	"	20	2.0
C 73	"	9	0.9	NC 47	"	20	2.0
NE 77	St Ann	20	2.0	NW 55	"	12	1.2
SE 63	"	18	1.8	SC 23	"	20	2.0
SE 71	"	18	1.8	SC 69	"	20	2.0
N 103	Trelawny	20	2.0	SW 75*	"	-	-
N 3	"	20	2.0				
N 9	"	20	2.0				
TOTAL						**1,016**	**100.0**

*** (EDs) that were not done in the survey**.

E – East; W- West; N – North; S – South; C – Central

a. Sample Domains

The sample domains are defined as the analytical subgroups for which equally reliable estimates are required.

The agreed sampling domains for this study are:

1. Kingston Metropolitan Area (KMA)
2. Other towns (OTs)
3. Rural areas (RAs)

b. Target Population

The target population for this survey is usual residents at least 18 years old, who are living in private dwelling units at the time of the survey. Excluded from this and most household surveys in Jamaica are persons living in non-private dwellings such as military camps, mental institutions, hospitals and prisons.

c. Sample Design

The design for this survey is a multi-stage cluster probability sample, with three stages of selection. The sample is selected in stages to maximize its efficiency. The stratification of the sample ensures an adequate spread of the sample within the sampling domain and across the fourteen parishes of Jamaica. The clustering of survey elements in this sample design allows for a reduction in administrative, travel and other data collection costs. The three (3) stages of this sample design are:

1. Stage 1: Selection of Enumeration Districts (ED)
2. Stage 2: Selection of dwelling units
3. Stage 3: Selection of respondents

For the qualitative aspect of the study, persons were chosen randomly to form two separate homogenous groups of between six to twelve persons each. In this selection, one group was from the Mico Practicing Primary and Junior High School in the Kingston and St. Andrew area, and the IWCAM work groups in Portland.

Stratification

Strata are independent and mutually exclusive subsets of the population. Within each stratum, sample elements are selected independently, as each ED in Jamaica is wholly contained in one and only one of the strata identified for this survey. The sample is explicitly stratified by the three domains specified earlier, namely the Kingston Metropolitan Area (KMA), other towns (OTs) and rural areas (RAs). The KMA consists of the parish of Kingston (all urban) and the urban areas of St. Andrew. Other towns consist of the parish capitals and other urban areas not in the KMA, and rural areas consist of all the remaining areas not in KMA or OTs. Within each domain, the sample is implicitly stratified by parish.

Clustering

During the first stage of sampling, clusters of dwellings, i.e. the Enumeration Districts (EDs) are selected. Within each cluster, a fixed number of dwellings are selected systematically to be representative of that ED. This allows for better management of interviewer workload, the sample size and survey costs.

Sample Frame

The sampling frame is based on the data and cartographic materials from the 2011 Population and Housing Census conducted by the Statistical Institute of Jamaica (STATIN). Data from the Census is used to examine the distribution of households, dwellings and the target population across the specified sampling domains. The cartographic materials from the 2011 Population and Housing Census are used to locate the selected dwellings.

The sample frame is organized based on the list of Enumeration Districts (EDs) canvassed by STATIN for the ***2011 Population & Housing Census***. EDs are geographically defined collections of dwelling units used by STATIN specifically for survey purposes. An ED is either urban or rural, with average size of 150 dwellings for urban and 100 dwellings for rural. EDs are defined in such a way to ensure that each ED:

1. Is wholly contained within one of Jamaica's fourteen parishes.
2. Is entirely urban or rural.
3. Contains approximately the same number of dwellings.

Sample Size

The sample size per stratum is determined based on the following key assumptions:

1. The desired level of confidence for key estimates is **95%**. This is represented by the value of the corresponding two-tailed Z-statistic.
2. Among the main survey indicators to be measured is the proportion of the population that is aware of NEPA, which is assumed to be the smallest proportion. In other words, the proportion of persons who are aware of the environment and environmental issues is expected to be at least equal to the proportion of persons who are aware of NEPA. As such, the sample size that suits this indicator will also yield reliable estimates for the other core indicators.
    a. The proportion of persons who are aware of NEPA is conservatively assumed to be at least **50%** of the target population.
3. The anticipated response rate for this survey is **80%**. This is a conservative estimate based on current trends in response rates in household surveys in Jamaica.

4. Based on the 2011 Census, **99.8%** of dwellings are expected to have at least one eligible respondent.
5. The desired margin of error of the estimates is **5%**.

Given that there are three (3) strata, the total sample size is therefore: 480 x 3 = 1,440 dwellings.

Cluster Size and the Number of PSUs

As indicated previously, Enumeration Districts, which are geographical units, are used as the clusters for this survey, therefore, it is anticipated that there will be some degree of homogeneity among the sampled households with respect to certain social and demographic characteristics.

It is to be noted that a smaller number of sample elements selected per ED would increase the precision and efficiency of the survey. This desire for increased precision and efficiency must be balanced against costs however. In order to achieve this balance, it was determined that twenty (20) dwellings should be selected per ED.

Sample Allocation

A number of options may be considered for the distribution of the sample across the sampling domains; the two best-suited options, proportionate allocation and equal sample size allocation, are considered here. All other things being equal, proportionate allocation is the most suitable for producing national estimates and subgroup estimates where the subgroups are evenly distributed. On the other hand, equal sample size allocation is the most suitable for producing regional/subgroup estimates. It is assumed that the precision of regional/subgroup estimates should take precedence over the precision of national estimates.

The proportionate allocation would not yield estimates at the required level of precision in two of the three domains identified in this survey, as the subgroups are not evenly distributed. The equal allocation however, will yield reliable estimates in all three domains, and therefore, this is the method used to distribute the sample.

Sample Selection

Stage 1: Selection of EDS

The first stage involves the selection of Primary Sampling Units (PSUs), which are area units based on census Enumeration Districts. During the first stage of selection, PSUs are selected within each sampling domain with **probability proportionate to size**. The dwelling count, according to the 2011 Census, is used as the measure of size.

Within each stratum, twenty-four (24) EDs are selected. Despite implicit stratification by parish, the resulting sample did not include the parish of Hanover in the other towns' stratum; therefore, for representativeness, one urban ED from Hanover was purposively included in the sample.

Stage 2: Selection of Dwelling Units

Generally, a dwelling unit is any building or separate and independent part of a building in which a person or group of persons are living at the time of the survey, while a household consists of one person who lives alone or a group of persons who, as a unit, jointly occupies the whole or part of a dwelling unit, who have common arrangements for housekeeping, and who generally share at least one meal.

This sample design employs the selection of dwelling units as the Secondary Sampling Units (SSUs). Based on the 2011 Census estimates, there are 1.03 households per dwelling. In most cases, there will be only one household per selected dwelling unit. In cases where there are more than one household in a dwelling unit, the interviewer will be required to select one household to be representative of the selected dwelling. To maintain the probability design of the sample, and its associated benefits, it is important that the selection of households be done randomly.

The selection of households may be done using the following random selection approach:

1. The interviewer assigns a number to each household found in the selected dwelling.
2. The interviewer blindly selects a number between one and the total number of households found.

3. The interviewer interviews the selected household only.
4. The interviewer records all steps taken during the selection process.

Stage 3: Selection of Respondents

The third stage involves the selection of one eligible respondent within each household as the Ultimate Sampling Unit (USU). In cases where there is more than one eligible respondent in a household, the respondent is selected by the interviewer using the **"Next Birthday"** method, which is a random selection method that is generally accepted as appropriate within household selection techniques. This method involves the selection of the eligible respondent with the nearest up-coming birth-date to the date of the interview.

Questionnaire Administration

The pre-constructed interviewer-administered questionnaires were to be administered by carefully selected and well-trained interviewers from all fourteen parishes in the island. Each of the two focus group discussions was facilitated by a trained researcher in the area of qualitative research, along with an able assistant.

Study Instruments

a. Quantitative Instrument

The instrument used for the quantitative aspect of the study (a modified instrument from a previous study), was a pre-constructed interviewer-administered one, and was modified/ constructed with the largest number of the questions being closed-ended. These questions were so constructed for easy coding and time to elicit quality responses at the same. A few of the questions were constructed in such a way so as to get some type of qualitative response – open-ended.

Additionally, the instrument was divided into six areas to collect specific data to be used. Section **one** captured socio-demographic data, which was, among other things, used in cross tabulation for analysis. Section **two** required information on the public's knowledge of specific environmental issues; section **three** required information about respondents' practices and

behaviour towards the environment. Section **four** required data on the attitudes of respondents, while section **five** captured data on how the public perceived NEPA. Finally, section **six** captured data on NEPA's public education campaign and how the campaign/s and activities have influenced respondents' behaviour.

The questionnaire with its various sections, fulfilled the four "survey goals", as indicated in the Terms of Reference (TOR). Section one of the questionnaire provided a crosscutting infusion into all the objectives of the survey, by means of cross tabulating the socio-demographic data with selected variables in the other five sections of the questionnaire. Sections two, three and four were set to fulfil goals/objectives numbers two and three, both of which had to do with the public's knowledge, attitudes, practices and behaviour. Section five of the questionnaire was set to fulfil goal/objective number one, which has to do with the public's perception of NEPA, and section six was set to fulfil goal/objective number four, which has to do with NEPA's public education campaign/s.

Reliability was rigorously sought; so selected questions were strategically repeated to test for reliability. These were not set contiguous to the related question, but placed elsewhere and worded slightly differently from its "sister" question.

To authenticate the veracity of the administration of the questionnaires, a portion of the sample, approximately 25% of the total questionnaires being administered, was used; that is, about **five** from each selected division. Upon filling out the consent forms, interviewers were required to record cell numbers/telephone numbers of the respondents on the consent forms.

A sample of each interviewer's forms was taken out and the respondents were called in order to verify that he or she had participated in the study. While administering the questionnaire, a corresponding code, to that placed on the corresponding consent form, was placed on the questionnaire and if the particular respondent had denied any knowledge of participating in the study, the questionnaire was withdrawn and the interviewer had to re-do the questionnaire with someone else of an exact similar profile – location, age group, and gender.

It must be explained here that the confidentiality of respondents was not breached or compromised, as in the data analysis there would be no relationship with the completed consent form and the questions answered on the instrument. So that, in reality no one would know who answered any particular question.

b. Qualitative Instrument

For the qualitative aspect, two focus group discussions were conducted; one in the Kingston Metropolitan Area at the Mico Practicing Primary and Junior High School and the other in Port Antonio with 'key' persons who participated in the Drivers River Watershed Project in Portland. An interview guide for each of the focus group exercises was constructed and was organized as follows:

1. **Engagement questions**: These were used to introduce participants and to make them comfortable with the topic of discussion. This was the ice-breaking exercise.
2. **Exploration questions**: These were used to get to the critical aspects of the discussion, and they formed the bulk of the discussion. Six questions were used for the Portland aspect of the study, while for the Mico Practicing Primary and Junior High School, seven questions were used. Probing questions came at the end of most responses in both groups.
3. **Exit question**: this was used to determine if anything was omitted during the discussion.

All prepared questions/areas of focus on the interview guide for the focus group discussion (FGD), which was the qualitative instrument, were open-ended. They were so designed as to allow participants to talk and give depths of information that were qualitative. Other questions were asked to clarify points during the probing part of the exercise, and this was done as often as was necessary. Some of the probing questions definitely were close-ended and could not be determined beforehand.

Pre-testing of Quantitative Data Collection Instrument

This questionnaire was pre-tested with about twenty (20) persons from communities in selected parishes; utilizing an urban/rural mix. Some modifications were done as deemed

necessary. These were done in order to render the instrument more useful and to be able to capture as much as possible of the data it was intended to capture.

Data Analysis

The quantitative aspect of the data was analysed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics including cross tabulation, were used to examine differences among variables.

Frequencies were used to measure trends, as well as multivariate/bi-variate analyses, in order to compare knowledge, attitudes, practices and behaviour with socio-demographic data. Tables, Charts and Narratives were used to present the findings. The qualitative aspect was done using Microsoft Excel for coding/selecting themes. At another level, it was done manually for more detailed analysis. In Microsoft, the data was compiled, analysed and synthesized.

In the analysis, the qualitative data was examined at three (3) levels, as explained below:

1. **Raw data** presented statements made by respondents. Aspects of the data were ordered or categorized by natural levels or themes in the topic.
2. **Descriptive statements** summarized respondents' comments and provided illustrative examples using the raw data.
3. **Interpretation** was built on the descriptive process by providing or presenting meaning of the data. This added more depth to the analysis.

SECTION THREE

RESEARCH FINDINGS

A. Quantitative Findings

Socio-demographic Information – Section 1

Population

Table 3 below shows the estimated weighted population and the percentage distribution by parish.

The weighted estimated population was 10,185. The largest proportion of respondents (15.8%) was from the parish of St Catherine followed by Clarendon (11.4%), St Andrew (10.9%), St James (10.4%) and Westmoreland (8%).

The smallest proportions of respondents were reported from Kingston (1.9%), Portland (3.1%), St Mary (3.4%), St Thomas (3.7%) and Hanover (4.5%).

Table 3: Estimated Weighted Population & Responses by Parish

Parish	***Number***	***Percent***
Kingston	*192*	*1.9*
St Andrew	*1,110*	*10.9*
St Thomas	*378*	*3.7*
Portland	*313*	*3.1*
St Mary	*341*	*3.4*
St Ann	*688*	*6.7*
Trelawny	*614*	*6.0*
St James	*1,061*	*10.4*
Hanover	*460*	*4.5*
Westmoreland	*810*	*8.0*
St Elizabeth	*705*	*6.9*
Clarendon	*1,161*	*11.4*
Manchester	*742*	*7.3*
St Catherine	*1,609*	*15.8*
Total	***10,185***	***100.0***

Parish Distribution and Gender

Table 4 below shows the percentage distribution of respondents by parish and gender. Most respondents were female (58.5%) compared to males (41.5%).

More than 10% of female respondents were from the following parishes – St Catherine (17.3%), St Andrew (11.4%), and Clarendon (10.9%). Males greater than 10% were from St Catherine (13.8%), Clarendon (12.1%), St James (12.1%) and St Andrew (10.5%).

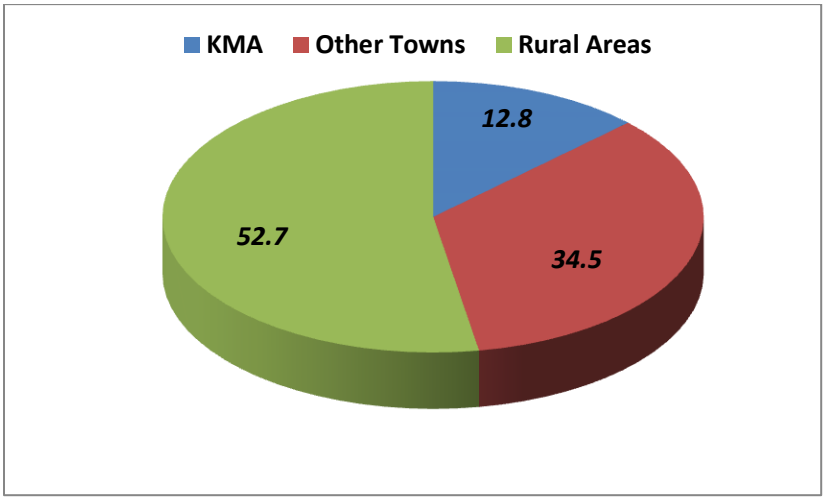
Table 4: Percentage Distribution by Parish and Gender

Parishes	***Male***	***Female***
Kingston	*41(1.0)*	*133(2.3)*
St Andrew	*438(10.5)*	*672(11.4)*
St Thomas	*79(1.9)*	*295(5.0)*
Portland	*85(2.0)*	*228(3.9)*
St Mary	*156(3.7)*	*179(3.0)*
St Ann	*333(8.0)*	*328(5.6)*
Trelawny	*311(7.4)*	*304(5.2)*
St James	*505(12.1)*	*548(9.3)*
Hanover	*150(3.6)*	*492(8.3)*
Westmoreland	*318(7.6)*	*492(8.3)*
St Elizabeth	*323(7.7)*	*383(6.5)*
Clarendon	*505(12.1)*	*640(10.9)*
Manchester	*363(8.7)*	*361(6.1)*
St Catherine	*577(13.8)*	*1022(17.3)*
Total	***4184(41.5)***	***5895(58.5)***

Distribution by Location

Figure 1 shows the percentage distribution of responses by location (Sampling Domains). Slightly more than half of the respondents were from the rural areas (RAs) - 52.7% compared to 34.5% from other towns (OT) and other rural areas not in the Kingston Metropolitan Area; and 12.8% were from the Kingston Metropolitan Area (KMA).

Figure 1: Percentage Distribution of Responses by Location (Sampling Domains)



Socio-demographic Information – Age and Gender

In Table 5 & Figure 2 below are shown the percentage distribution of age groups by gender. More than two-thirds (64.4%) of the respondents were in the age range 25-54 years-19.6% (45-54yrs), 22.5% (35-44yrs) and 22.3% (25-34yrs). In addition, 7% were 65 years and over, 13.5% (18-24 years), and about 1% of ages were unknown.

About half of the female respondents were distributed in the age range 25-44 years; 24.6% were in the range 25-34yrs, 24.4% were in the range 35-44yrs. Males were more likely to be in the 25-54yrs age range; 19.7% were in the range 25-34yrs, and 20.5% in the range 35-44yrs.

Table 5: Percentage Distribution of Age Group by Gender

Age grouping	*Frequency*	*Percent*	*Gender*	
			Male	*Female*
18 – 24	*1,380*	*13.5*	*574(13.8)*	*791(13.6)*
25 – 34	*2,272*	*22.3*	*821(19.7)*	*1,436(24.6)*
35-44	*2,291*	*22.5*	*855(20.5)*	*1,421(24.4)*
45 – 54	*1,996*	*19.6*	*917(22.0)*	*1,064(18.2)*
55 – 64	*1,438*	*14.1*	*676(16.2)*	*7 38(12.7)*
65 and over	*712*	*7.0*	*325(7.8)*	*381(6.5)*
Unknown	*98*	*1.0*		
Total	***10,185***		***4,168(41.7)***	***5,831(58.3)***

Number of Children

Respondents were asked to indicate if they had children—77.4% said, “Yes”, while 22.2% said “no”. Half of one percent (0.5%) did not respond.

From Table 6 below the overall mean number of children indicated was 2.96. Males reported a slightly higher number of children than females (males with a mean of 3.12 versus females with a mean of 2.86.

Table 6: Mean Number of Children

Item	*Mean*	*Std. Dev.*	*95% CI*	*Range*
Overall	*2.96*	*2.163*	*2.91-3.01*	*1-19*
Males	*3.12*	*2.506*	*303-3.21*	*1-19*
Females	*2.86*	*1.910*	*2.81-2.91*	*1-16*

Employment

Table 7 below shows that a little more than half of the respondents were presently employed - (53.7%). A notably high proportion (45.9%) was unemployed and 0.4% did not respond.

The highest level of employment reported was for the parishes of St Catherine (14.6%), St Andrew (13.7%) and St James (12.3%).

With respect to unemployment, high proportions were noted for St Catherine (17.4%), Clarendon (16%), and St James (7.8%).

Table 7: Distribution of Employment by Parishes

Parish	***Yes***	***No***
Kingston	*86(1.6)*	*103(2.2)*
St Andrew	*748(13.7)*	*362(4.7)*
St Thomas	*151(2.8)*	*227(4.9)*
Portland	*127(2.3)*	*186(4.0)*
St Mary	*69(1.3)*	*272(5.8)*
St Ann	*409(7.5)*	*267(5.7)*
Trelawny	*349(6.4)*	*266(5.7)*
St James	*674(12.3)*	*363(7.8)*
Hanover	*270(4.9)*	*190(4.1)*
Westmoreland	*568(10.4)*	*242(6.8)*
St Elizabeth	*383(7.0)*	*316(6.8)*
Clarendon	*414(7.6)*	*747(16.0)*
Manchester	*422(7.7)*	*320(6.8)*
St Catherine	*796(14.6)*	*813(17.4)*
Overall	***5465 (53.7)***	***4674 (45.9)***

Employment and Location/Area

Of all the employed persons represented on Table 8 below, 52.3% were in the rural areas, 32.4% were in the other towns and 15.3% were in the KMA. Rural areas (RAs) have the largest proportion of persons reporting not being employed (53.4%), while KMA has the smallest proportion (9.9%). 36.7% of respondents in other towns (OTs) reported not being employed.

Table 8: Distribution of Employment by Location

Location	***Employed***	
	Yes	***No***
KMA	*835(15.3)*	*464(9.9)*
Other Towns	*1771(32.4)*	*1714(36.7)*
Rural Areas	*2859(52.3)*	*2496(53.4)*

Employment and Age

Table 9 shows that of those who said "yes" they were employed, seven percent (7%) was in the 18-24yrs range compared to 21.6% of those who said that they were unemployed. Among the various age ranges, the highest proportion of employment was reported for the 35-44yrs range (28.1%), followed by the 25-34yrs range (25.8%) and the 45-54yrs range with (23.2%).

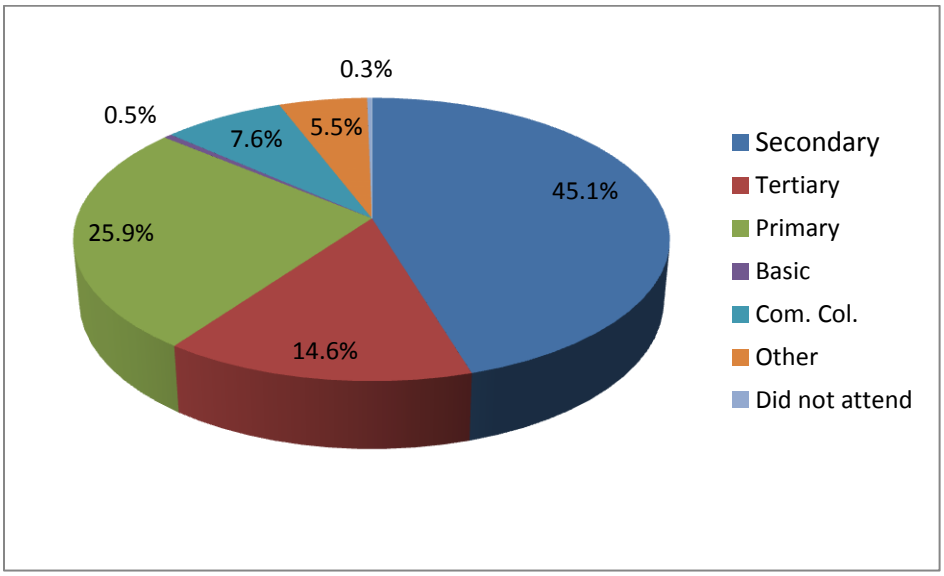
Table 9: Percentage Distribution of Employment by Age Grouping

Age Grouping	***Employment***	
	Yes	***No***
18 – 24	*382 (7.0)*	*998 (21.6)*
25 – 34	*1403 (25.8)*	*866 (18.7)*
35-44	*1525 (28.1)*	*766 (16.6)*
45 – 54	*1259 (23.2)*	*722 (15.6)*
55 – 64	*763 (14.0)*	*666 (14.4)*
65 and over	*102 (1.9)*	*602 (13.0)*

Last Level of Schooling Completed

Figure 2 below shows the last school completed by respondents. Most respondents had completed either the secondary/high or technical level (45.1%) or the primary/all age level (25.9%). A notable proportion had completed the tertiary level (university, college, etc.), (14.6%). In addition, 7.6% had completed community college and 5.5% completed other level of schooling. Less than half of one percent indicated not attending school and 0.5% indicated only completing the basic level of schooling.

Figure 2: Percentage Distribution of Last Level of Schooling Completed



Union Status and Employment

Forty-five point one percent (45.1%) of respondents were single (not living with anyone). The next highest proportion were married persons (26.6%); followed by those in common-law unions (living with a partner), (19%).

Approximately 40% of single respondents were employed, as were 31.9% of married respondents. Just over one-fifth (1/5) of common-law respondents were employed as illustrated in Table 10 below.

Table 10: Distribution of Union Status by Employment

Union Status	*Overall*	*Employment*	
		Yes	*No*
Single	*4598(45.1)*	*2196(40.4)*	*2399(51.5)*
Married	*2705(26.6)*	*1733(31.9)*	*946(20.7)*
Separated	*330(3.2)*	*187(3.4)*	*143(3.1)*
Divorced	*204(2.0)*	*52(1.0)*	*152(3.3)*
Widowed	*348(3.4)*	*92(1.7)*	*248(5.3)*
Common law	*1937(19.0)*	*1180(21.7)*	*749(16.1)*

Knowledge of the Environment – Section 2

Question in relation to Table 11: **"**What do you understand by the term, 'environment*"*?

For the most part, the responses were very varied. The most prevalent response was the "surroundings"; indicated by 53.4% of respondents. Ten percent (10%) indicated that they did not know and the next notable proportion was 9.4% who said it was understood to be the community (Table 11 refers). Some other responses indicated were, "everything around us"; "around you"; "atmosphere"; and "keeping surroundings clean". Most of the varied responses were for the most part indicated by less than one percent of respondents. In other words, less than one percent would have indicated "everything around us"; or "around you"; or "atmosphere"; and "keeping surroundings clean" as examples.

Table A4 in Appendix 20 shows a distribution of all the responses to this question.

Table 11: Most Prevalent Responses re "What is the Environment"?

Surroundings	***53.4 %***
Don't Know	***10.1%***
Community	***9.4%***

Question in relation to Table 12: "At present, what do you personally think is the major issue affecting Jamaica's environment. The most prevalent responses were, "garbage disposal (37.3%), pollution (15.2%), and don't know (6.3%)". Responses here were also varied, since it was an open-ended question and included; pesticides, plastics, water/water crisis/water pollution, mosquitoes, greenhouse effects, global warming, burning and roads. Table A5 in Appendix 21 shows a distribution of all responses to this question.

Table 12: Most Prevalent Responses re Major Issues Affecting the Environment

Garbage Disposal	***37.3 %***
Pollution	***15.2%***
Don't Know	***6.3%***

Question in relation to Table 13: "Which aspect of Jamaica's environment do you think is **mos**t threatened?" The most prevalent responses were, "water and water systems (13.3%), air and atmosphere (8.8%) and land 5.8%".

Importantly, other aspects of the environment were mentioned, which included the following:

- Beaches
- Fishing Industry
- Communities
- Forests
- Mining
- Farming
- Garbage collection
- Marine life
- Riverton City Dump
- Rivers
- Coastlines
- Seas/sea shores
- Wildlife
- Roads
- Reefs

Table 13: Most Prevalent Responses re Most Threatened Aspect of the Environment

Water/Watersheds/Water Systems	***13.3 %***
Air/Atmosphere	***8.8%***
Don't know	***14.8%***
Land	***5.8%***

Negative Impact on the Environment

Question in relation to Tables 14 & 15, & Figures 3 to 6:

a. How would you rate the negative effect of each of the following on Jamaica's environment? Answer on a scale from 1 to 10, with 1 having no effect and 10 having tremendous effect. Kindly indicate **DK (Don't Know)** if you are unfamiliar with the item.

b. Which **one** on the Table below do you think has the greatest negative impact on Jamaica's environment? (**Place a tick in the extreme right column to indicate the answer.)**

Table 14 following shows the percentage distribution of responses to this question.

Table 14: Percentage Distribution of Responses re Rating of Negative Impacts

	Rating (Scale 1-10 with 1 having no effect and 10 having tremendous effect											
Item	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***DK***	****GNI***
Household Garbage	*9.6*	*3.6*	*4.4*	*4.6*	*13.6*	*7.7*	*11.2*	*11.7*	*8.6*	*22.6*	*2.5*	***33.0***
2. Automobile Exhaust	*12.1*	*3.6*	*6.1*	*4.9*	*10.1*	*7.5*	*8.8*	*12.1*	*8.9*	*18.7*	*7.3*	***13.7***
3. Sewage Pollution	*20.1*	*3.5*	*4.0*	*4.7*	*7.8*	*7.5*	*8.3*	*10.4*	*8.0*	*18.0*	*6.8*	***14.5***
4. The Forestry Industry	*22.5*	*4.6*	*7.1*	*6.3*	*9.2*	*7.0*	*7.2*	*6.4*	*5.3*	*9.0*	*15.5*	***4.9***
5. The Fishing Industry	*28.5*	*5.6*	*5.9*	*6.9*	*10.2*	*4.7*	*4.2*	*7.0*	*4.0*	*5.1*	*17.8*	***1.3***
6. The Mining Industry	*18.4*	*3.2*	*4.5*	*5.4*	*10.2*	*6.3*	*7.4*	*9.1*	*6.2*	*10.7*	*18.7*	***5.9***
7. The individual resident	*20.3*	*4.2*	*5.2*	*5.3*	*8.9*	*8.8*	*7.5*	*9.1*	*8.8*	*13.3*	*9.4*	***7.6***
8. Toxic Wastes	*19.9*	*3.2*	*3.7*	*4.6*	*5.3*	*5.5*	*6.2*	*7.3*	*10.2*	*15.1*	*19.1*	***7.4***
9. Manufacturing Plants/ Factories	*21.7*	*3.5*	*3.4*	*4.3*	*7.7*	*6.8*	*7.1*	*8.2*	*7.7*	*13.8*	*15.7*	***7.2***
10. Agriculture's use of pesticides & herbicides	*22.1*	*4.1*	*4.8*	*5.8*	*10.5*	*7.2*	*6.9*	*7.4*	*7.2*	*12.1*	*12.0*	***4.2***

*GNI=greatest negative impact

Tremendous Negative Effect on the Environment

The results are presented with the items deemed as having the most impact in highest rank order.

1. **Household Garbage** – 22.6% of respondents ranked this at number 10 (having tremendous negative effect on the environment). The largest proportion of respondents ranked this item as having the most tremendous negative effect; however, 9.6% felt that this item had no effect on the environment and a small proportion (2.5%) did not know or were unfamiliar with its effect.

2. **Automotive Exhaust** – 18.7% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 12.1% felt this item had no effect on the environment and a small proportion (7.3%) did not know or were unfamiliar with its effect.

3. **Sewage Pollution** - 18% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 20.1% felt that this item had no effect on the environment and a small proportion (6.8%) did not know or were unfamiliar with its effect.

4. **Toxic Waste** – 15.1% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 19.9% felt that this item had no effect on the environment and a notably large proportion (19.1%) did not know or were unfamiliar with its effect.

5 **Manufacturing Plants/Factories** – 13.8% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 21.7% felt that this item had no effect on the environment and a notably large proportion (15.7%) did not know or were unfamiliar with its effect.

6 **The individual resident** – 13.3% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 20.3% felt that this item had no effect on the environment and a notable proportion (9.4%) did not know or were unfamiliar with its.

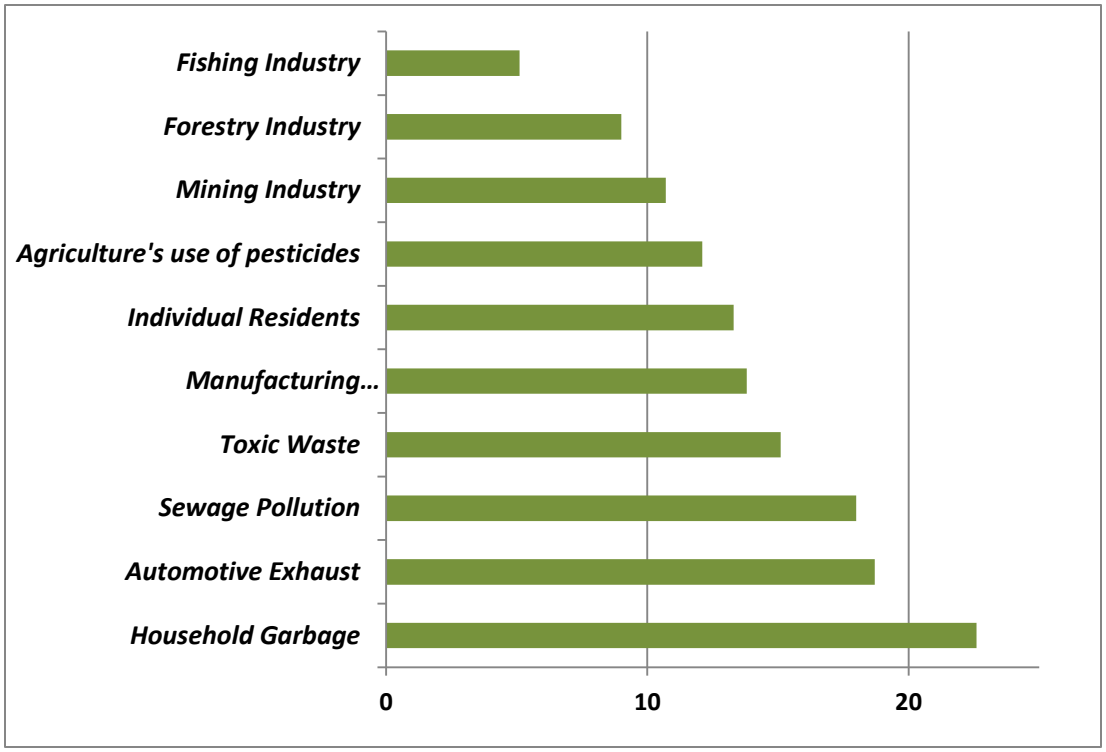
7 **Agriculture's use of pesticides and herbicides** – 12.1% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 22.1% felt that this item had no effect on the environment, and a notable proportion (12%) did not know or were unfamiliar with its effect.

8 **The Mining Industry** – 10.7% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 18.4% felt this item had no effect on the environment and a notably large proportion (18.7%) did not know or were unfamiliar with its effect.

9 **The Forestry Industry** - 9% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 22.5% felt that this item had no effect on the environment and a notably large proportion (15.5%) did not know or were unfamiliar with its effect.

10 **The Fishing Industry** - 5.1% of respondents ranked this at number 10 (having tremendous negative effect on the environment); however, 28.5% felt that this item had no effect on the environment and a notably large proportion (17.8%) did not know or were unfamiliar with tits effect.

Figure 3: Percentage Distribution - Number 10 (having tremendous negative effect on the environment)



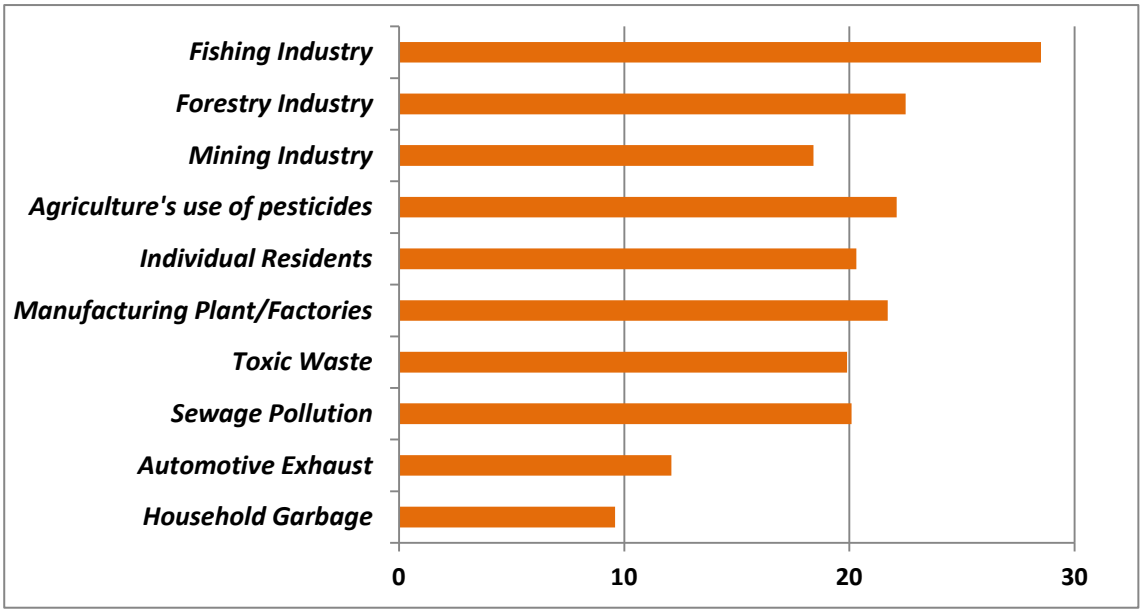
No Negative Effect on the Environment

As shown in Figure 4, the Fishing Industry (28.5%) was the most prevalent item rated as having the least negative effect on the environment.

More than a quarter of the respondents felt that this industry had no negative effect on the environment.

Just about one-fifth (1/5) or a little more than one-fifth (1/%) indicated that the Forestry Industry (22.5%) had the least negative effect on the environment, Agriculture's use of insecticide/or pesticides (22.1%), Manufacturing Plants/ or factories (21.7%), individual residents (20.3%), sewage pollution (20.1%); and toxic waste (19.9%), were other items among the responses indicating the least negative impact on the environment.

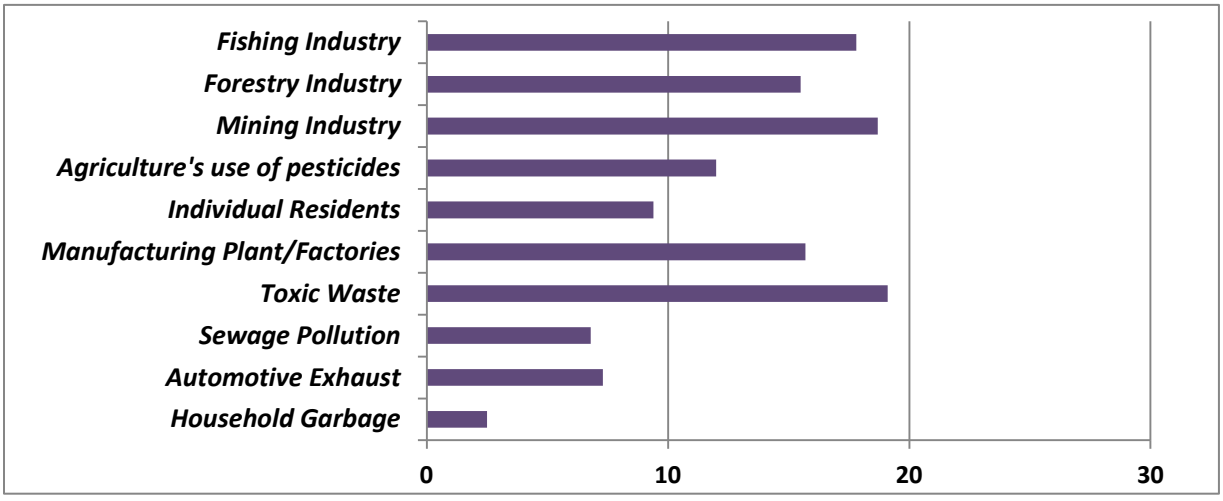
Figure 4: Percentage Distribution - Number 1 (having no negative effect on the environment)



Unfamiliar with the Item's Impact on the Environment

In Figure 5, a notably high proportion (>15%) of respondents indicated that they did not know (were unfamiliar) with the impact of the items on the environment. The five items indicated were, The Fishing Industry, the Forestry Industry, Mining Industry, Manufacturing Plants or factories and toxic waste.

Figure 5: Percentage Distribution - Respondents who were unfamiliar with the items' impact on the environment)



Greatest Negative Impact

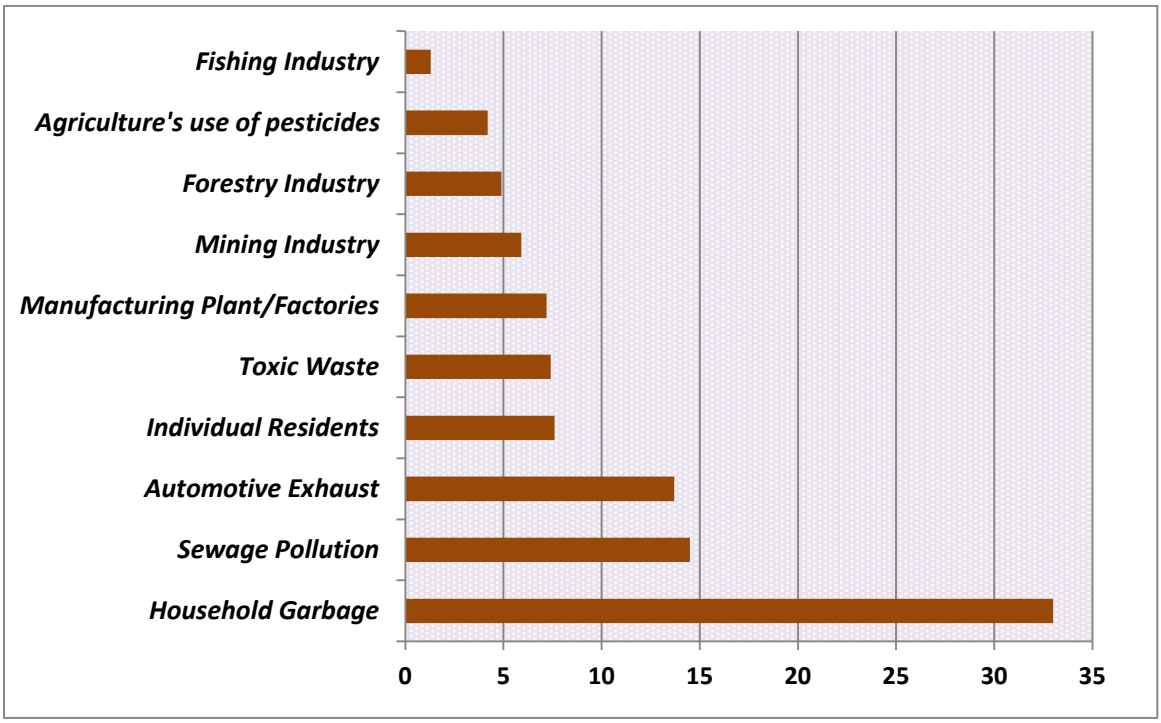
In response to the question: “Which one item has the greatest negative impact on Jamaica’s environment?”

As shown in Figure 6, a reasonably large proportion of respondents (about one-third (33%) indicated “household garbage”.

Of note were the responses for sewage pollution (14.5%) and automotive exhaust (13.7%).

The items identified by the lowest proportion of respondents as having the greatest impact were the Fishing Industry (1.3%), Agriculture’s use of insecticides/or pesticides (4.2%), the Forestry Industry (4.9%) and the Mining Industry (5.9%).

Figure 6: Percentage Distribution – Items with the Greatest Negative Impact on the Environment



Trend Analysis - Greatest negative Impact on the Environment

Table 15 below shows the comparison of greatest negative impact of pollution on the environment by year – 1991, 1998 & 2015.

Table 15: Comparison of Greatest Negative Impacts on the Environment by Year

Item	*1991*	*1998*	*2015*
Household Garbage	*17.6*	*22.5*	*33.0*
2. Automobile Exhaust	*10.2*	*11.6*	*13.7*
3. Sewage Pollution	*18.8*	*14.8*	*14.5*
4. The Forestry Industry	*7.5*	*14.0*	*4.9*
5. The Fishing Industry	*2.9*	*1.5*	*1.3*
6. The Mining Industry	*4.4*	*6.0*	*5.9*
7. The individual resident	*7.1*	*8.6*	*7.6*
8. Toxic Wastes	*7.5*	*7.0*	*7.4*
9 Manufacturing Plants/ Factories*	*4.9*	*3.1*	*7.2*
10. Agriculture's use of pesticides & herbicides	*4.9*	*4.3*	*4.2*

*Industrial Plants between 1991-1998

As can be seen on Table 15, notably more respondents identified household garage as causing the greatest negative impact on the environment in 2015 compared to 1998 and 1991. Almost twice as many persons indicated this in 2015 over 1991 (33% versus 17.6%), however about 50% more persons felt this way in 2015 compared to 1998 (33% versus 22.5%).

Persons perception of automobile exhaust and manufacturing plants/ industrial plants were the only other items on the list that increased (though slightly); 2.1 percentage points over 1998 for automobile exhaust and 4.1 percentage points over 1998 for manufacturing plants. The perception of all other items decreased slightly, except in the case of The Forestry Industry, which decreased by 9.1 percentage points.

Contributors to Air Pollution

Question in relation to Tables 16 to 18, & Figure 7: "Which of the following contribute to air pollution?"

Ten (10) items were indicated and three (3) options given: major contributor, minor contributor, does not contribute at all (not at all) and those who did not know of the items' contribution.

Table 16: Contributions to Air Pollution

Item	***Major***	***Minor***	***Not at all***	***Don't know***
Automobile Emissions	*55.9*	*23.2*	*8.9*	*12.5*
The Fishing Industry	*14.4*	*36.7*	*30.9*	*18.0*
Burning refuse/rubbish	*74.9*	*15.6*	*5.4*	*4.1*
Industrial Plants	*40.0*	*25.9*	*16.0*	*18.0*
Citrus Farms	*8.2*	*32.4*	*36.0*	*23.4*
Power Generating Plants	*30.9*	*27.7*	*19.9*	*21.5*
Aerial crop dusting (spraying)	*35.1*	*31.2*	*16.3*	*17.5*
Quarrying	*32.5*	*28.5*	*18.2*	*20.9*
Sewage Treatment Plants	*40.8*	*23.8*	*17.6*	*17.7*
Sugar Estates (cane burning)	*51.6*	*22.7*	*12.5*	*13.2*

Automobile Emissions – about **60%** of respondents felt that this was a major contributor to air pollution while a little more than one-fifth (23.2%) felt that it was a minor contributor. 9% did not think it contributed at all. A notable proportion (12.1%) did not know of its contribution.

The Fishing Industry – only 14.4% of respondents felt that this was a major contributor to air pollution, while more than a third (36.7%) felt that it was a minor contributor. A significant proportion (30.9%) did not think it contributed at all. A notable proportion (18%) did not know of its contribution.

Burning refuse/rubbish - about three-quarters (74.9**%)** of the respondents felt that this was a major contributor to air pollution, while 15.6% felt that it was a minor contributor. 5.4% did not think that it contributed at all. A notable proportion (4.1%) did not know of its contribution.

Industrial Plants - about four out of every ten (4**0%**) respondent felt that this was a major contributor to air pollution, while little more than a quarter (25.9%) felt that it was a minor contributor. A notable proportion (16%) did not think it contributed at all and another notable proportion (18%) did not know of its contribution.

Citrus Farms – only 8**%** of respondents felt that this was a major contributor to air pollution, while about one-third (32.4%) felt that it was a minor contributor. 36% did not think it contributed at all. A notable proportion (23.4%) did not know of its contribution.

Power Generating Plants –31**%** of respondents felt that this was a major contributor to air pollution, while a little more than a quarter (27.7%) felt that it was a minor contributor. 19.9% did not think it contributed at all. A notable proportion (21.5%) did not know of its contribution.

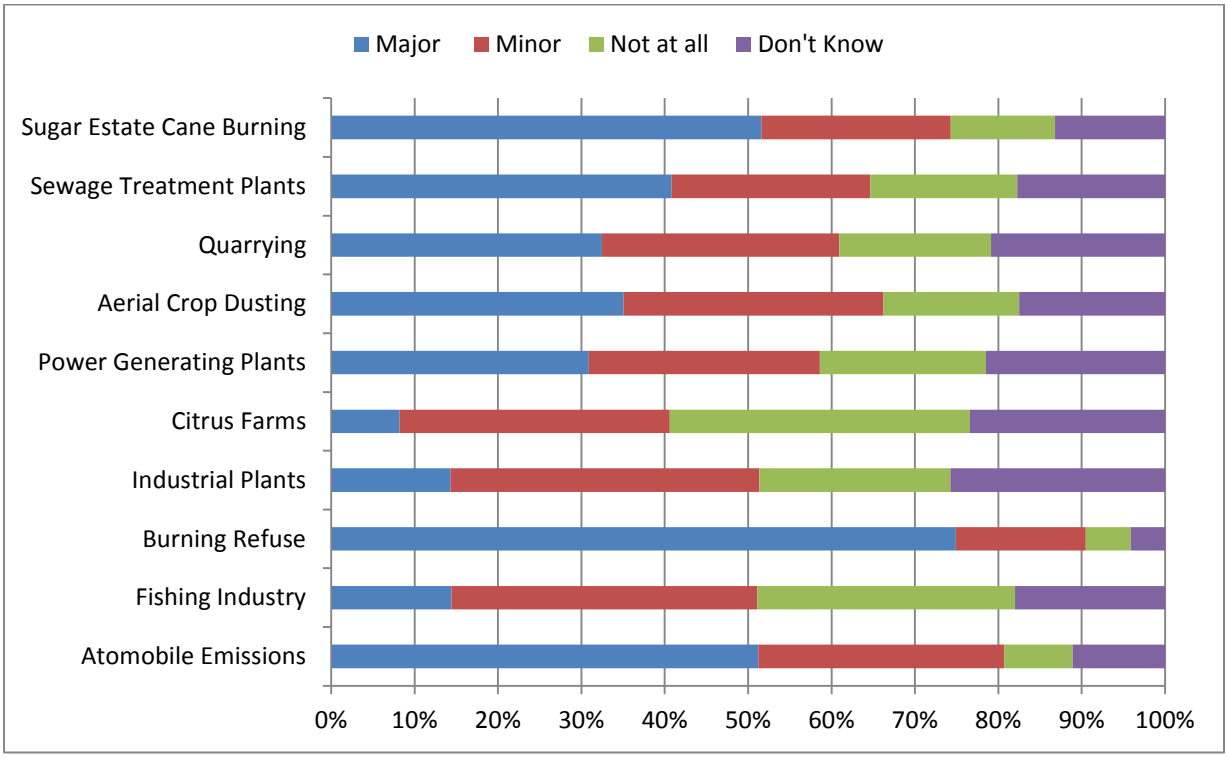
Aerial crop dusting (spraying) - about 35**%** of respondents felt that this was a major contributor to air pollution, while three in every ten (31.2%) respondent felt that it was a minor contributor. 16.3% did not think it contributed at all. A notable proportion (17.5%) did not know of its contribution.

Quarrying - about 33**%** of respondents felt that this was a major contributor to air pollution; while more than a-quarter (28.5%) felt that it was a minor contributor. 18.2% did not think it contributed at all. A notable proportion (20.9%) did not know of its contribution.

Sewage Treatment Plants - about 41**%** of respondents felt that this was a major contributor to air pollution, while a little more than one-fifth (23.8%) felt that it was a minor contributor. 17.6% did not think it contributed at all. A notable proportion (17.7%) did not know of its contribution.

Sugar Estates (cane burning) - about 52% of respondents felt that this was a major contributor to air pollution, while a little more than one-fifth (22.7%) felt that it was a minor contributor. 12.5% did not think it contributed at all. A notable proportion (13.2%) did not know of its contribution.

Figure 7: Percentage Distribution of Contributions to Air Pollution



Summary Contributors to Air Pollution

For the most part, respondents identified burning of rubbish, automobile emission, sugar estate (cane burning), sewage treatment plants and to a lesser extent, industrial plants as the major contributors to air pollution; as seen in Figure 7.

Major Contributions to Air Pollution by Location

Responses to the question on contribution to air pollution were cross-tabulated for respondents by the location (Sampling Domain) they resided in. Table 17 below shows the results. For the most part, those respondents from the KMA felt that the major contributors to air pollution were burning refuse/rubbish (86.2%); automobile emission (71%), sewage treatment plants (57.9% and cane burning (54.2%).

This was essentially the same pattern indicated by respondents from the other towns and rural areas, as depicted in the Table and Chart following. The most prevalent response to the major contributors was also burning of refuse, and automobile emissions.

Table 17: Major Contributions to Air Pollution by Location (Sampling Domain)

Item	***Location ~~Towns~~***		
	KMA	***Other Towns***	***Rural Areas***
Auto mobile emissions	*71.0*	*58.8*	*50.4*
The Fishing Industry	*11.0*	*15.4*	*14.6*
Burning refuse/rubbish	*86.2*	*77.5*	*70.6*
Industrial Plants	*46.2*	*42.1*	*37.1*
Citrus farms	*3.3*	*7.2*	*10.0*
Power Generating Plants	*41.6*	*31.4*	*28.0*
Aerial crop dusting (spraying)	*42.9*	*36.4*	*32.3*
Quarrying	*41.2*	*35.9*	*28.1*
Sewage Treatment Plants	*57.9*	*42.2*	*35.8*
Sugar estates (cane burning)	*54.2*	*53.6*	*49.6*

Trend Analysis – Degree to which Certain Factors Contribute to Air Pollution

Table 18 below shows the trend analysis of contributions to air pollution in 1998 and 2015.

As in 1998, respondents indicated that the fishing industry and citrus farms were "major" contributors to air pollution; however, the proportions indicating automobile emissions as a major contributor decreased from 70.4% in 1998 to 55.9% in 2015. Burning of rubbish showed a notable increase in 2015 compared to 1998 (74.9% versus 56.8%). Quarrying was seen less as a major contributor in 2015 compared to 1998, but cane burning remained about the same. The average proportion of respondents who stated that they' did not know' on all ten items was slightly lower in 2015 (16.7%) compared to 1998 (19.9%).

Table 18: Contributions to Air Pollution – 1998 vs. 2015

	2015 Survey				***1998 Survey***			
Item	*Major*	*Minor*	*Not at all*	*Don't know*	*Major*	*Minor*	*Not at all*	*Don't know*
Automobile Emissions	*55.9*	*23.2*	*8.9*	*12.5*	*70.4*	*8.1*	*1.6*	*19.9*
The Fishing Industry	*14.4*	*36.7*	*30.9*	*18.0*	*13.6*	*13.7*	*33.1*	*22.6*
Burning refuse/rubbish	*74.9*	*15.6*	*5.4*	*4.1*	*56.8*	*31.0*	*4.3*	*8.0*
Industrial Plants	*40.0*	*25.9*	*16.0*	*18.0*	*67.6*	*11.9*	*3.7*	*16.8*
Citrus Farms	*8.2*	*32.4*	*36.0*	*23.4*	*10.1*	*22.8*	*45.4*	*21.7*
Power Generating Plants	*30.9*	*27.7*	*19.9*	*21.5*	*40.4*	*26.2*	*11.0*	*22.4*
Aerial crop dusting (spraying)	*35.1*	*31.2*	*16.3*	*17.5*	*44.5*	*21.1*	*10.7*	*23.7*
Quarrying	*32.5*	*28.5*	*18.2*	*20.9*	*40.0*	*33.5*	*7.3*	*19.3*
Sewage Treatment Plants	*40.8*	*23.8*	*17.6*	*17.7*	*43.8*	*22.7*	*10.7*	*22.8*
Sugar Estates (cane burning)	*51.6*	*22.7*	*12.5*	*13.2*	*51.5*	*30.1*	*4.6*	*13.7*

Pollutants in Motor Vehicle Exhaust Emissions

Question in relation to Tables 19 - 21: "Which of the following are pollutants in motor vehicle exhaust emissions?"

Ten (10) items were indicated and three (3) options given: major contributor, minor contributor, does not contribute at all (not at all) and those who did not know of the item's contribution. The results are shown in Table 19 below.

Table 19: Pollutants in Motor Vehicle Exhaust

Pollutants	***major***	***minor***	***not at all***	***Don't know***
Carbon Dioxide	*42.6*	*15.4*	*6.8*	*35.3*
Carbon Monoxide	*41.8*	*13.4*	*4.9*	*39.9*
Lead	*33.2*	*15.8*	*7.0*	*44.0*
Oxygen	*12.8*	*21.4*	*21.4*	*44.4*
Arsenic	*20.8*	*14.7*	*8.4*	*56.0*
Small particles	*16.5*	*25.9*	*8.9*	*48.7*
Tin	*14.4*	*20.6*	*10.6*	*54.4*
Sulphur Oxides	*22.2*	*14.4*	*8.8*	*54.5*
Nitrogen Oxides	*20.8*	*14.8*	*8.1*	*56.3*
Iron Oxides	*17.0*	*13.9*	*8.1*	*60.9*

Carbon Dioxide – about 43**%** of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 15.4% felt that it was a minor contributor. 6.8% did not think it contributed at all. A notably high proportion (35.3%) did not know of its contribution.

Carbon Monoxide –41.8% of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 13.4% felt that it was a minor contributor. A small proportion (4.9%) did not think it contributed at all. A notably high proportion (39.9%) did not know of its contribution.

Lead - about one-third (33.2**%)** of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 15.8% felt that it was a minor contributor.7% did not think it contributed at all.; however, a notably high proportion (44%) did not know of its contribution.

Oxygen - about 13**%** of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while a little more than one-fifth (21.4%) felt that it was a minor contributor. A notable proportion (21.4%) did not think it contributed at all and another notable high proportion (44.4%) did not know of its contribution.

Arsenic – one-fifth (20.8**%)** of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 14.7% felt that it was a minor contributor. 8.4% did not think it contributed at all. More than one-half (56%) did not know of its contribution.

Small particles –16.5% of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while a little more than one-quarter (25.9%) felt that it was a minor contributor. 8.9% did not think it contributed at all. A notable high proportion, almost half, (48.7%) did not know of its contribution.

Tin - about 14**%** of respondents felt that this was a major **pollutant in motor vehicle exhaust**, while one-fifth (20.6%) felt that it was a minor contributor. 10.6% did not think it contributed at all. More than one-half (54.4%) did not know of its contribution.

Sulphur Oxides - about 22**%** of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 14.4% felt that it was a minor contributor. 8.8% did not think it contributed at all. More than one-half (54.5%) did not know.

Nitrogen Oxides - about 21**%** of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 14.8% felt that it was a minor contributor. 8.1% did not think it contributed at all. More than one-half (56.3%) did not know of its contribution.

Iron Oxides - 17% of respondents felt that this was a major **pollutant in motor vehicle exhaust,** while 13.9% felt that it was a minor contributor. 8.1% did not think it contributed at all. Six of every ten respondents (60.9%) did not know of its contribution.

Summary - Pollutants in Motor Vehicle Exhaust

For the most part, respondents only identified carbon dioxide, carbon monoxide and lead as the major pollutants in motor vehicle exhaust. A significant high proportion of respondents (40-60%) did not know/could not identify eight of the ten items as being pollutants in motor vehicle exhaust.

Pollutants in Motor Vehicle Exhaust by Gender and Location

Responses to the question: "Indicate which of the items in the Table provided were **pollutants in motor vehicle exhaust",** was analysed by gender and location (Sampling Domain) seen in Table 20. Notably, more males compared to females identified the items in the list provided as being major pollutants in motor vehicle exhaust. This was the case in all instances.

With respect to the tabulation by location, for all items, a greater proportion of respondents in the KMA identified items in the list as being major pollutants in motor vehicle exhaust. Respondents in the rural areas were more likely to indicate small particles as a major pollutant in motor vehicle exhaust compared to respondents in the towns, (Table 20).

Table 20: Pollutants in Motor Vehicle Exhaust by Gender and Location (Sampling Domain)

Major	***Male***	***Female***	***KMA***	***Other Towns***	***Rural Areas***
Carbon Dioxide	*49.9*	*37.2*	*61.2*	*42.7*	*38.0*
Carbon Monoxide	*48.5*	*37.2*	*62.2*	*44.9*	*34.8*
Lead	*38.6*	*29.6*	*57.6*	*31.8*	*28.1*
Oxygen	*13.9*	*12.2*	*16.5*	*11.1*	*13.0*
Arsenic	*24.2*	*18.4*	*33.2*	*21.0*	*17.7*
Small particles	*20.6*	*13.6*	*25.3*	*13.5*	*16.4*
Tin	*16.7*	*13.0*	*21.1*	*14.2*	*13.1*
Sulphur Oxides	*26.7*	*19.3*	*45.9*	*23.3*	*15.8*
Nitrogen Oxides	*23.6*	*19.1*	*39.9*	*19.9*	*16.7*
Iron Oxides	*19.4*	*15.7*	*32.5*	*17.1*	*13.3*

Trend Analysis - Pollutants in Motor Vehicle Exhaust

Table 21 below shows the response to the question, "Which of the following are pollutants in motor vehicle exhaust?" It is a comparison between the 1998 and 2015 surveys.

Table 21: Pollutants in Motor Vehicle Exhaust – 1998 vs. 2015

Pollutants	***Correct response***	***2015 Survey***				***1998 Survey***			
		major	*minor*	*not at all*	*Don't know*	*major*	*minor*	*not at all*	*Don't know*
Carbon Dioxide	***Major***	*42.6*	*15.4*	*6.8*	*35.3*	*36.6*	*9.1*	*2.3*	*52.1*
Carbon Monoxide	***Major***	*41.8*	*13.4*	*4.9*	*39.9*	*39.8*	*8.0*	*4.4*	*47.8*
Lead	***Major***	*33.2*	*15.8*	*7.0*	*44.0*	*35.7*	*13.3*	*7.2*	*43.8*
Oxygen	***Not at all***	*12.8*	*21.4*	*21.4*	*44.4*	*7.1*	*10.7*	*37.7*	*44.5*
Arsenic	***Not at all***	*20.8*	*14.7*	*8.4*	*56.0*	*8.0*	*7.8*	*14.4*	*69.8*
Small particles	***Major***	*16.5*	*25.9*	*8.9*	*48.7*	*16.5*	*25.0*	*4.1*	*54.4*
Tin	***Not at all***	*14.4*	*20.6*	*10.6*	*54.4*	*9.1*	*12.0*	*13.5*	*65.4*
Sulphur Oxides	***Major***	*22.2*	*14.4*	*8.8*	*54.5*	*17.7*	*10.2*	*4.9*	*67.1*
Nitrogen Oxides	***Major***	*20.8*	*14.8*	*8.1*	*56.3*	*11.4*	*12.0*	*5.5*	*71.2*
Iron Oxides	***Not at all***	*17.0*	*13.9*	*8.1*	*60.9*	*12.7*	*10.2*	*4.9*	*72.4*

An even higher proportion of respondents in 2015 identified the four items that are not pollutants in exhaust, when compared to 1998; however, for those correctly identified as major pollutants, a slightly higher proportion of respondents in 2015 identified carbon dioxide, carbon monoxide, sulfur oxide and nitrogen oxides as major pollutants. When the correct responses only are considered, a considerably high proportion of respondents continue to indicate that they do not know which items are pollutants in motor vehicle exhaust. The average proportion of responses of "don't know" decreased slightly from 56% in 1998 to 47% in 2015.

What Negatively Affects the Quality of Freshwater for Drinking?

Respondents were asked to indicate which of the items in the Table provided negatively impacted the quality of Freshwater for drinking. Twelve (12) items were indicated and four (4) options were given: major contributor, minor contributor, does not contribute at all (not at all) and those who did not know of the item's negative contribution. The results are shown in Table 22 below:

Question in relation to Tables 21 & 23: "Which of the following do you think negatively affects the **quality** of Freshwater for drinking?"

Table 22: What Negatively Affects the Quality of Freshwater for Drinking?

Item	*major*	*minor*	*not at all*	*Don't know*
Littering	*74.6*	*13.3*	*8.4*	*3.7*
Lack of rainfall	*66.9*	*22.4*	*6.6*	*4.1*
Deforestation	*54.2*	*23.3*	*12.8*	*9.6*
Pit latrines	*53.6*	*24.6*	*13.6*	*8.1*
Too many housing schemes	*28.7*	*32.8*	*28.5*	*10.0*
Industrial effluent discharge	*49.5*	*19.5*	*11.6*	*9.4*
Fish Farming	*14.9*	*34.2*	*31.9*	*18.9*
Soak away pits	*50.0*	*24.8*	*12.9*	*12.3*
Use of pesticides by farmers	*43.0*	*31.2*	*14.5*	*11.3*
Sewage Treatment Plants	*47.2*	*24.7*	*14.9*	*13.2*
Population increase	*36.9*	*27.9*	*23.8*	*11.4*
Lack of water storage capacity	*54.0*	*22.5*	*13.5*	*10.1*

Littering – about 75**%** of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while 13.3% felt that it was a minor contributor. 8.4% did not think it contributed at all. A small proportion (3.7%) did not know of its contribution.

Lack of rainfall –66.9% of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while 22.4% felt that it was a minor contributor. A small proportion (6.6%) did not think it contributed at all, and another small proportion (4.1%) did not know of its contribution.

Deforestation – a little more than half (54.2**%)** of the respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while 23.3% felt that it was a minor contributor. 12.8% did not think it contributed at all. A small proportion (9.6%) did not know of its contribution.

Pit latrine – a little more than half of the respondents (53.6%) felt that this would negatively affect the quality of Freshwater for drinking in a major way while just about a quarter (24.6%) felt that it was a minor contributor. A notable proportion (13.6%) did not think it contributed at all and 8.1% did not know of its contribution.

Too many housing schemes – 28.7**%** of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while about a third (32.8%) felt that it was a minor contributor. A significant proportion (28.5%) did not think it contributed at all. Ten percent (10%) did not know of its contribution.

Industrial effluent discharge – about 50% of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while just about one-fifth (19.5%) felt that it was a minor contributor. 11.6% did not think it contributed at all. A notably high proportion, almost one-fifth (19.4%) did not know of its contribution.

Fish Farming - about 15**%** of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way while one-third (34.2%) felt that it was a minor contributor. 31.9% did not think it contributed at all. A notably high proportion (18.9%) did not know of its contribution.

Soak away pits – half (50%) of the respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while 24.8% felt that it was a minor contributor. 12.9% did not think it contributed at all and 12.3% did not know of its contribution.

Use of pesticides by farmers - 43**%** of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while about one-third (32.1%) felt that it was a minor contributor. 14.5% did not think it contributed at all, and about 11% did not know of its contribution.

Sewage Treatment Plants –47% of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while 24.7% felt that it was a minor contributor. 14.9% did not think it contributed at all. A notably high proportion of respondents (13.2%) did not know of its contribution.

Population increase – over one-third (36.9%) of respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while more than a quarter (27.9%) felt that it was a minor contributor Over one-fifth (23.8%) did not think it contributed at all, and more than ten percent (11.4%) did not know of its contribution.

Lack of water storage capacity – more than half (54%) of the respondents felt that this would negatively affect the quality of Freshwater for drinking in a major way, while 22.5% felt that it was a minor contributor. 13.5% did not think it contributed at all, and ten percent (10%) did not know of its contribution.

Summary – What Negatively Affects the Quality of Freshwater for Drinking.

From Table 16 and Figure 14, for the most part, more than 50% or more (up to 75%) of the respondents identified seven (7) of the twelve (12) items as major factors that would negatively impact the quality of Freshwater for drinking: (See items shown below in rank order)

1. Littering
2. Lack of rainfall
3. Deforestation
4. Lack of water storage capacity
5. Pit privy/latrines
6. Soak away pits
7. Industrial effluent discharge

Trend Analysis - The Degree to which Certain Factors Negatively Affect the Quality of Freshwater for Drinking

Table 23 below shows the responses to the question, "Which of the following do you think negatively affects the quality of Freshwater for drinking?" It is a comparison between the 1998 and 2015 surveys.

Table 23: What Negatively Affects the Quality of Freshwater for Drinking – 1998 & 2015?

Item	*2015 Survey*				*1998 Survey*			
	Major	*Minor*	*Not at all*	*Don't know*	*Major*	*Minor*	*Not at all*	*Don't know*
Littering	*74.6*	*13.3*	*8.4*	*3.7*	*72.6*	*14.9*	*4.4*	*8.2*
Lack of rainfall	*66.9*	*22.4*	*6.6*	*4.1*	*83.9*	*10.8*	*1.0*	*4.3*
Deforestation	*54.2*	*23.3*	*12.8*	*9.6*	*66.1*	*14.4*	*3.9*	*15.6*
Pit latrines	*53.6*	*24.6*	*13.6*	*8.1*	*35.5*	*35.7*	*14.7*	*14.1*
Too many housing schemes	*28.7*	*32.8*	*28.5*	*10.0*	*28.6*	*31.9*	*26.6*	*12.9*
Industrial effluent discharge	*49.5*	*19.5*	*11.6*	*9.4*	*58.6*	*13.8*	*5.7*	*21.9*
Fish farming	*14.9*	*34.2*	*31.9*	*18.9*	*17.5*	*29.7*	*27.9*	*24.8*
Soak away pits	*50.0*	*24.8*	*12.9*	*12.3*	*37.7*	*32.0*	*15.0*	*15.3*
Use of pesticides by farmers	*43.0*	*31.2*	*14.5*	*11.3*	*46.6*	*28.8*	*9.0*	*15.6*
Sewage treatment plants	*47.2*	*24.7*	*14.9*	*13.2*	*47.4*	*21.5*	*16.4*	*20.7*
Population increase	*36.9*	*27.9*	*23.8*	*11.4*	*46.5*	*27.1*	*16.2*	*10.2*
Lack of water storage capacity	*54.0*	*22.5*	*13.5*	*10.1*	*82.9*	*8.7*	*2.1*	*6.3*

In comparison to 1998, the proportion of respondents identifying items such as fish farming as having a negative impact on water quality showed a slight decrease (now 14.9% versus 17.5% then), housing schemes were about the same, pit latrines showed a notable increase (53.6% now versus 35.5% then) and soak away pits increased (50% now versus 37.7% then).

What Negatively Affects the Quantity of Freshwater for Drinking?

Respondents were asked to indicate which of the items in the Table provided negatively impacted the quantity of Freshwater for drinking. The same twelve (12) items presented for

'quality' were indicated and four (4) options given: major contributor, minor contributor, does not contribute at all (not at all) and those who did not know of the item's negative contribution. Table 24 below shows the results:

Question in relation to Table 24: "Which of the following do you think negatively affects the **quantity** of Freshwater for drinking?"

Table 24: What Negatively Affects the Quantity of Freshwater for Drinking?

Item	*major*	*minor*	*not at all*	*Don't know*
Littering	*55.5*	*22.3*	*16.1*	*6.2*
Lack of rainfall	*84.9*	*9.7*	*2.8*	*2.6*
Deforestation	*59.8*	*22.2*	*10.4*	*7.7*
Pit latrines	*35.0*	*30.6*	*23.3*	*11.2*
Too many housing schemes	*39.6*	*29.6*	*21.3*	*9.6*
Industrial effluent discharge	*32.1*	*28.0*	*19.2*	*20.6*
Fish farming	*14.7*	*36.0*	*29.5*	*19.8*
Soak away pits	*33.5*	*29.1*	*23.0*	*14.3*
Use of pesticides by farmers	*25.6*	*34.9*	*26.5*	*12.9*
Sewage Treatment Plants	*32.0*	*28.1*	*25.5*	*14.2*
Population increase	*48.0*	*25.0*	*17.7*	*9.3*
Lack of water storage capacity	*67.4*	*15.2*	*8.7*	*8.7*

Littering – about 56**%** of respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while 22.3% felt that it was a minor contributor. 16.1% did not think it contributed at all, and a small proportion (6.2%) did not know of its contribution.

Lack of rainfall – 85% of respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while 9.7% felt that it was a minor contributor. A small proportion (2.8%) did not think it contributed at all, and another small proportion (2.6%) did not know of its contribution.

Deforestation – Almost six of every ten (59.8**%)** respondent felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while 22.2% felt that it was a minor contributor. 10.4% did not think it contributed at all, and a small proportion (7.7%) did not know of its contribution.

Pit latrine – a little more than one-third of the respondents (35%) felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while just about a quarter (30.6%) felt that it was a minor contributor. A notably high proportion (23.3%) did not think it contributed at all and 11.2% did not know of its contribution.

Too many housing schemes – 39.6**%** of respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while about a third (29.6%) felt that it was a minor contributor. A notably high proportion (21.3%) did not think it contributed at all. About ten percent (9.6%) did not know of its contribution.

Industrial effluent discharge – about 32.1% of respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while more than a quarter (28%) felt that it was a minor contributor. About one-fifth (19.2%) did not think it contributed at all. In addition, a notably high proportion, one-fifth (20.6%) did not know of its contribution.

Fish Farming - about 15**%** of respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way; while more than one-third, (36%) felt that it was a minor contributor. A significantly high proportion (29.5%) did not think it contributed at all, and a notably high proportion (19.8%) did not know of its contribution.

Soak away pits – one-third (33.5%) of the respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while 29.1% felt that it was a minor contributor. 23% did not think it contributed at all and 14.3% did not know of its contribution.

Use of pesticides by farmers – one-quarter of the respondents (25.6%) felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while more than one-third (34.9%) felt that it was a minor contributor. A significantly large proportion (26.5%) did not think it contributed at all, and about 13% did not know of its contribution.

Sewage Treatment Plants – 32% of respondents felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while 28.1% felt that it was a minor contributor. 25.5% did not think it contributed at all, and a notably high proportion of respondents (14.2%) did not know of its contribution.

Population increase – over four in every ten (48%) respondent felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while a quarter (25%) felt that it was a minor contributor. 17.7% did not think it contributed at all, and nine percent (9%) did not know of its contribution.

Lack of water storage capacity – more than six of every ten respondents (67.4%) felt that this would negatively affect the quantity of Freshwater for drinking in a major way, while 15.2% felt that it was a minor contributor. 8.7% did not think it contributed at all, and about nine percent (9%) did not know of its contribution.

Summary – What Negatively Affects the Quantity of Freshwater for Drinking?

From Table 23, for the most part, more than 50% or more (up to 85%) of the respondents identified four (4) of the twelve (12) items as major factors that would negatively impact the quantity of Freshwater for drinking: (See items shown below in rank order)

1. Lack of rainfall
2. Lack of water storage capacity
3. Deforestation
4. Littering

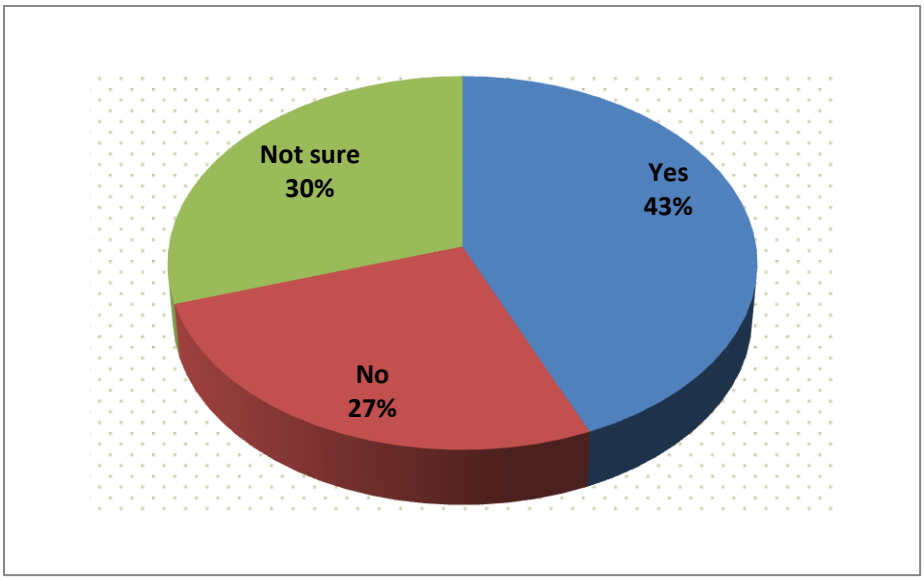
Need for Environmental Education

Question in relation to Figure 8: "Would you say that you have enough information on actions you personally could take to help protect the environment?"

Four out of every ten respondent (43.1%) said "yes", while a little more than a quarter (26.4%) said "no" ,and 29.6% were not sure, as shown in Figure 8.

With respect to the type of information respondents would like to obtain, many varied responses were given and are presented in Table A7 in Appendix 23.

Figure 8: Information to Help Protect the Environment



Trend Analysis - Information to Help Protect the Environment

Significantly, fewer respondents in 2015 said that they had enough information on actions they personally could take to help protect the environment. There was an 18-percentage point decrease compared to 1998, in persons who said, "yes", they had enough information". In 2015, if those who said "no and not sure" were combined it would show that 57% of respondents felt that they did not have enough information. This compared to 52% in 1991 and 35% in 1998.

Attitude to the Environment – Section 3

Concern for the Environment

Question in relation to Tables 25 - 27, and Figure 9: "Generally speaking, which of the following statements best describe your feelings about the environment?"

Table 25 and Figure 9 present the percentage responses. Four of every ten respondents (40%) said that they were 'extremely concerned' about the environment.
About one-fifth (20.9%) were quite concerned, 20.1% had some concern, 14.7% had a few concerns and 4.4% had no concerns about the environment.

Males were not dissimilar to females with respect to their concerns for the environment (same pattern as for the overall responses). When cross-tabulated by location the same pattern emerged as seen in Table 25.

Regardless of location, most respondents were extremely concerned and the proportion decreased as the levels of concern decreased.

Table 25: Percentage Response – Concerns about the Environment by Gender

Item	***Overall***	***Male***	***Female***
I have no concerns about the environment	*4.4*	*3.4*	*5.1*
I have few concerns about the environment	*14.7*	*14.7*	*14.8*
I have some concerns about the environment	*20.1*	*21.5*	*18.9*
I am quite concerned about the environment	*20.9*	*22.4*	*19.9*
I am extremely concerned about the environment	*40.0*	*38.0*	*41.3*

Figure 9: Concerns about the Environment

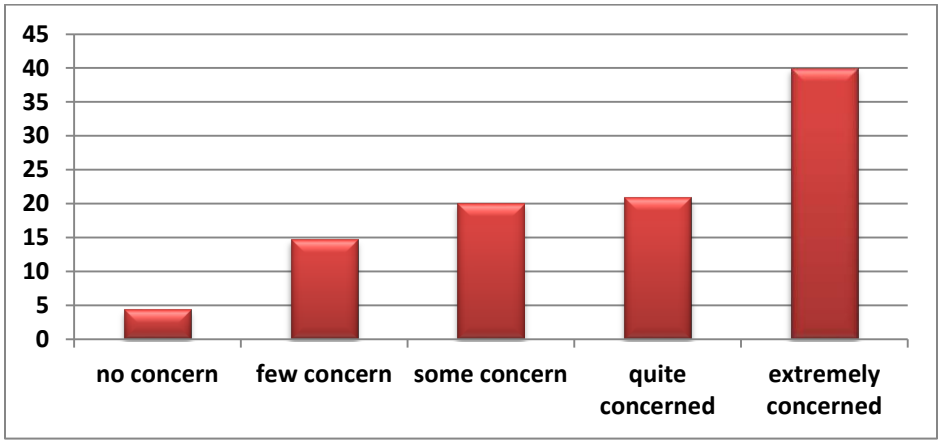


Table 26: Percentage Response – Concerns about the Environment by Location (Sampling Domain)

Item	*Location*		
	KMA	*Other towns*	*Rural areas*
*I have **no concerns** about the environment*	*0.5*	*3.4*	*5.9*
*I have **few concerns** about the environment*	*11.1*	*16.3*	*14.5*
*I have **some concerns** about the environment*	*21.4*	*21.9*	*18.5*
*I am **quite concerned** about the environment*	*19.0*	*19.8*	*22.2*
*I am **extremely concerned** about the environment*	*48.0*	*38.6*	*38.9*

Trend Analysis – Level of Concern about the Environment

Table 27 below shows a comparison of respondents' levels of concern about the environment in 1991, 1998 & 2015.

Concern for the environment significantly increased in 2015 compared to the other two periods. The level of unconcern for the environment decreased by 12 percentage points over 1998. Those who were concerned showed less marked decreased, in that the levels of concern decreased only by about 7 percentage points over 1998. The most significant result was the 22-percentage point increase among those who were concerned (quite extremely concerned).

Table 27: Percentage Response – Concerns about the Environment by Year

Item	*2015 Survey*	*1998 Survey*	*1991 Survey*
I have no concerns about the environment	*4.4*	*12.3*	*19.5*
I have few concerns about the environment	*14.7*	*18.8*	*14.6*
I have some concerns about the environment	*20.1*	*27.3*	*24.4*
I am quite concerned about the environment	*20.9*	*23.7*	*23.3*
I am extremely concerned about the environment	*40.0*	*15.2*	*14.9*
Un-concerned	*19.9*	*31.1*	*34.1*
Some concern	*20.1*	*27.3*	*24.4*
Concerned	*60.9*	*38.9*	*38.2*

Concern for the Environment over the Past Five Years

Question in relation to Tables 28 & 29: "Would you say that over the last five years your concerns for the environment have increased, decreased or remained the same?"

About four of every ten respondents (39.8%) said that their concern had increased significantly. About 30% had increased somewhat/a little, 23% remained the same, 4.9% had decreased somewhat/a little, and 2.6% said it had decreased significantly.

Table 28: Concerns for the Environment over the Past Five Years by Gender & Location (Sampling Domain)

Item	*Overall*	*Gender*		*Location*		
		Male	*Female*	*KMA*	*Other towns*	*Rural areas*
Increased significantly	*39.8*	*42.5*	*38.1*	*51.9*	*38.0*	*38.0*
Increased somewhat/a little	*29.7*	*28.8*	*30.4*	*30.9*	*30.1*	*29.2*
Remained the same	*23.0*	*20.6*	*24.4*	*11.2*	*25.8*	*24.1*
Decreased somewhat/a little	*4.9*	*5.9*	*4.2*	*6.0*	*3.0*	*5.9*
Decreased significantly	*2.6*	*2.2*	*2.8*	*0.0*	*3.1*	*2.9*

A large proportion of males as well as females indicated that their concerns had increased significantly (42.5% for males versus 38.1% females). The number of males and female decreased proportionally as the levels of concern decreased (from somewhat to remaining the

same, to decreasing somewhat and then decreasing significantly). When analysed by location, the same pattern was observed.

Trend Analysis - Concern for the Environment over the Past Five Years

In this trend analysis on Table 29 below, respondents' concerns for the environment over the past five years are shown. Responses are for the years 1998 & 2015.

Table 29: Concerns about the Environment over the Past Five Years

Item	***2015 Survey***	***1998 Survey***
Increased significantly	*39.8*	*16.7*
Increased somewhat/a little	*29.7*	*19.4*
Remained the same	*23.0*	*54.4*
Decreased somewhat/a little	*4.9*	*4.4*
Decreased significantly	*2.6*	*1.2*
Increased	*69.5*	*36.1*
No change	*23.0*	*54.4*
Decreased	*7.5*	*5.6*

Table 28 shows that concerns for the environment over the past five years increased significantly in 2015 compared to 1998 (a 33 percentage point increase). The proportion of respondents who indicated that their concerns remained the same were notable less in 2015 compared to 1998 (23% versus 54.4%), while those who said it decreased showed a slight increase in 2015 (7.5% versus 5.6 %)

Question in relation to Tables 29 &30: "How much effect do you think individuals such as yourself can have on protecting the environment"?

Overall a reasonably large proportion of respondents (34.8%) said that they could have "some effect". About a quarter (24.7%) felt that they could have an "extremely large effect", while 23.2% felt that it could be a "large effect". About 13% felt that individuals could have "very little effect", and 4.1% felt that they could have "no effect".

Table 30: Individual's Effect on Protecting the Environment by Gender and Location (Sampling Domain)

Effect	*Over all*	*Gender*		*Location*		
		Male	*Female*	*KMA*	*Other towns*	*Rural areas*
Can have an extremely large effect	*24.7*	*29.3*	*21.5*	*17.2*	*20.7*	*29.1*
Can have quite a large effect	*23.2*	*21.7*	*24.3*	*26.9*	*23.6*	*22.1*
Can have some effect	*34.8*	*31.1*	*37.4*	*37.7*	*39.1*	*31.2*
Can have very little effect	*13.2*	*14.2*	*12.5*	*15.4*	*14.2*	*12.1*
Can have no effect	*4.1*	*3.7*	*4.3*	*2.8*	*2.4*	*5.6*

Individual's Effect on Protecting the Environment – Gender and Location (Sampling Domain)

As shown in Table 28, most males as well as females indicated that an individual would have only some effect in protecting the environment (31% and 37% respectively); however, more males (29.3%) compared to females (21.5%) felt that one could have an extremely large effect. They were not dissimilar for the other categories.

When analysed by location, the same pattern was observed. Regardless of the location most respondents felt that individuals would only have some effect (37.7% for respondents from KMA, 39.1% for respondents from other towns and 31% for respondents from rural areas).

The other proportional responses were similar to the pattern for the overall responses.

Trend Analysis – Individual's Effect on Protecting the Environment

Below on Table 30 is represented individual's effect on protecting the environment by year - 1991, 1998 & 2015.

Table 31: Individual's Effect on Protecting the Environment by year

Effect	***2015 Survey***	***1998 Survey***	***1991 Survey***
Can have an extremely large effect	*24.7*	*11.3*	*7.5*
Can have quite a large effect	*23.2*	*18.0*	*18.8*
Can have some effect	*34.8*	*38.6*	*30.6*
Can have very little effect	*13.2*	*23.3*	*24.5*
Can have no effect	*4.1*	*8.1*	*18.8*
Large effect	*47.9*	*29.3*	*26.1*
Some effect	*34.8*	*38.6*	*30.6*
Little or no effect	*17.3*	*32.1*	*43.3*

In 1991, only 7% felt that individuals like themselves could have an extremely large effect in protecting the environment, and only 19% felt that they could have quite a large effect. In 1998 however, this increased to 11.3% for extremely large effect but remained the same for a large effect. In 2015, there was a significant increase in the proportion of individuals who felt that they could have an extremely large effect in protecting the environment (a 14-percentage point increase over 1998). Those who felt that they would have very little effect decreased markedly in 2015 compared to 1998; from 23% to 13%). Overall, significantly more individuals in 2015 felt that they could have some kind of an effect on protecting the environment, than individuals did in both 1998 and 1991.

Environment and Quality of Life

Question in relation to Table 32: With respect to the following statement, say whether you agree, strongly agree, are neutral, disagree, or strongly disagree; ***"The state of the environment is important to the quality of my life".***

In response, most (more than half, 58.4%) indicated that they "strongly agreed" that the state of the environment was important to the quality of their lives. About 32% "agreed" and a small proportion (7.5%) were neutral. Only 2.6% "disagreed" with the statement. All responses are shown on Table 32.

Table 32: Environment and Quality of Life by Gender & Location (Sampling Domain)

Item	*Overall*	*Gender*		*Location*		
		Male	*Female*	*KMA*	*Other Towns*	*Rural Areas*
Strongly agree	*58.4*	*57.7*	*58.8*	*70.7*	*59.2*	*54.9*
Agree	*31.6*	*32.2*	*31.2*	*25.0*	*31.3*	*33.4*
Neutral	*7.5*	*7.6*	*7.5*	*3.0*	*7.5*	*8.5*
Disagree	*1.9*	*1.4*	*2.1*	*1.2*	*1.3*	*2.4*
Strongly disagree	*07*	*1.1*	*0.4*	*0.2*	*0.7*	*0.7*

Males were as likely as females to strongly agree with the statement, and a higher proportion of respondents in all three locations strongly agreed with the statement. Less than three percent (3%) of respondents overall or among males and females or within the three locations disagreed (disagree or strongly disagree) with the statement.

Willingness to Participate in Environmental Protection

Questions in relation to Table 33: a. "Would you be willing to pay more money for environmentally friendly/less harmful products?"

b. "Would you be willing to take part in a community tree planting exercise or programme?"

c. "Would you be willing to join an organization dedicated to the protection of the environment?"

d. “If land was available to you, would you be willing to plant a seedling in your community?”

e. “If ‘yes’ to question above, would you be willing to care for that young seedling that you have planted?”

f.. “If you were living in a community which launched a garbage recycling programme, would you be willing to take part even if participation was not compulsory?”

h. “Do you think there is anything you can do to help protect the environment?”

Respondents were asked a series of questions about their willingness to participate in various activities or actions as presented in Table 33 below. The results are presented for the overall (O) responses as well as responses for males (M) and females (F). The categories of responses were “yes, no and not sure”. Table 33 below shows the responses.

Table 33: Willingness to Participate in Environmental Protection

Item	*	*Yes*	*No*	*Not sure*
Would you be willing to pay more money for environmentally friendly/less-harmful products?	*O*	*57.8*	*12.5*	*29.7*
	M	*60.1*	*12.6*	*27.2*
	F	*56.1*	*12.6*	*31.2*
Would you be willing to take part in a community tree planting exercise or programme?	*O*	*83.0*	*5.3*	*11.7*
	M	*84.9*	*5.7*	*9.4*
	F	*81.5*	*4.9*	*13.5*
Would you be willing to join an organization dedicated to the protection of the environment?	*O*	*79.1*	*4.7*	*16.2*
	M	*78.1*	*4.7*	*17.2*
	F	*79.9*	*4.6*	*15.4*
If land was available to you, would you be willing to plant a seedling in your community?	*O*	*90.0*	*3.8*	*6.2*
	M	*90.5*	*4.0*	*5.5*
	F	*89.5*	*3.6*	*6.9*
If “yes” to question above, would you be willing to care for that young seedling that you have planted?	*O*	*92.7*	*1.1*	*6.2*
	M	*93.1*	*0.8*	*6.1*
	F	*92.6*	*1.3*	*6.1*
If you were living in a community, which launched a garbage-recycling programme, would you be willing to take part even if participation was not compulsory?	*O*	*84.5*	*2.8*	*12.7*
	M	*85.0*	*3.2*	*11.8*
	F	*84.8*	*2.5*	*13.1*
Do you think there is anything you can do to help protect the environment?	*O*	*61.7*	*5.9*	*4.1*
	M	*62.7*	*5.9*	*3.7*
	F	*61.1*	*5.8*	*4.3*

O=overall responses M=male responses F=female responses

Would you be willing to pay more money for environmentally friendly/less-harmful products?

- Overall, more than half of all respondents (57.8%) said "yes", while 12.5% said "no". A notably large proportion (29.7%) was not sure if they would pay more for environmentally friendly/less-harmful products.

  More males and females were equally more likely to say "yes, they were would be willing to do this"; however, an equally large proportion was not sure for both groups.

Would you be willing to take part in a community tree planting exercise or programme?

- Eighty-three percent (83%) said, "Yes" (84.4% males and 81.5% females). A small proportion (5.3%) said "no", and 11.7% overall were unsure.

Would you be willing to join an organization dedicated to the protection of the environment?

- Almost eight of every ten respondents (79.1%) said, "Yes, they would be willing to join this type of organization".

  An equally high proportion of both males and female said, "Yes" (78.1% males and 79.9% female). Notably large proportions were unsure: 16.2% overall, 17.2% males and 15.4% females

If land was available to you, would you be willing to plant a seedling in your community?

- Ninety percent (90%) said, "yes" (90.5% males and 89.5% females). A small proportion (3.8%) said "no" and 6.2% overall were unsure.

If "yes" to question above, would you be willing to care for that young seedling that you have planted?

- Equally high proportions said, "Yes, they would be willing to care for the seeding" More than nine of every ten respondents overall (92.7%) with 93.1% of males and 92.6% of females were in support of this as well. About 1% said "no" and 6% overall were unsure.

If you were living in a community which launched a garbage-recycling programme, would you be willing to take part even if participation was not compulsory?

- *Quite a large proportion of respondents overall (84.5%) said "yes", they would participate in the recycling programme, 85% of both males and females.*
  A few said "no" (about 3%), but more than ten percent (12.7%) overall were unsure.

Do you think there is anything you can do to help protect the environment?

- About six of every ten respondents (61.7%) felt that there was something they could do to help protect the environment. A significantly large proportion was unsure (32.4%). This was the same pattern for both male and female respondents.

Change Lifestyle to Help Protect the Environment

Table 34 below shows responses in relation to respondents' change of lifestyles to help protect the environment overall by gender.

Table 34: Change Lifestyle to Help Protect the Environment by Gender

Do you feel that you would change your lifestyle in any way in the future to help protect the environment?			
Item	***Overall***	***Male***	***Female***
Yes	*66.5*	*68.5*	*65.5*
No	*3.1*	*2.4*	*3.6*
Probably	*26.3*	*25.4*	*27.1*
Don't know	*4.1*	*3.7*	*4.3*

Question in relation to Tables 34 & 35: "Do you feel that you would change your lifestyle in any way in the future to help protect the environment?"

Overall, about two-thirds said, "yes" (66.5%), while a small proportion said "no" (3.1%); however, a high proportion, more than a quarter (26.3%) said "probably "[yes] and only about 4% said they did not know.

This was the same pattern observed for both male and female respondents: 68.5% of males said "yes" compared to 65.5% of females. Slightly more females however said "probably" (27%) compared to males (25%).

Trend Analysis - Change Lifestyle to Help Protect the Environment

Respondents were asked the question, "*Do you feel that you would change your lifestyle in any way in the future to help protect the environment?"* Table 35 shows the comparative responses – 1991, 1998 & 2015.

Table 35: Change Lifestyle to Help Protect the Environment

Do you feel that you would change your lifestyle in any way in the future to help protect the environment?			
Item	***2015 Survey***	***1998 Survey***	***1991 Survey***
Yes	*66.5*	*56.4*	*61.7*
Probably	*26.3*	*29.4*	*16.7*
No	*3.1*	*6.8*	*7.5*
Don't know	*4.1*	*6.5*	*6.3*

In 1991, about 62% of the sample said that they were willing to change to a more environmentally friendly lifestyle, 17% said that they might, and 8% flatly said that they were unwilling. In 1998, the number of individuals who were willing to change to a more environmentally friendly lifestyle decreased to 56%, but in 2015, there was an increase to 67% (an 11-percentage point increase). Persons who were flatly unwilling notably decreased in 2015 (from 7% in 1998 to 3% in 2015).

Practices in the Environment – Section 4

Environmentally Appropriate Methods of Disposing of Household Garbage

Question in relation to Tables 36 & 37: "In communities where household garbage is not collected, which of the following methods would be environmentally appropriate for residents to dispose of their household garbage?"

Most respondents said "none of the above" (33.6%) or "burying" (33.7%). More than a quarter (28.8%) said "burning", while small proportions said "throw in gully" (1.4% or "throw in open lot" (2.5%).

More females (36%) compared to males 30.3%) said "burying" but more males opted for "none of the above" and "burning". Respondents in KMA were more likely to indicate "none of the above" (46.7%) or "burying" (36.1%), as were respondents in the other towns and rural areas. The responses are shown in Table 36 below:

Table 36: Environmentally Appropriate Methods of Disposing of Household Garbage by Gender & Location (Sampling Domain)

Methods	*Overall*	*Gender*		*Location*		
		Male	*Female*	*KMA*	*Other Towns*	*Rural Areas*
Burning	*28.8*	*30.5*	*27.4*	*14.4*	*31.3*	*30.7*
Burying	*33.7*	*30.3*	*36.0*	*36.1*	*33.6*	*33.1*
Throw in gully	*1.4*	*0.7*	*1.9*	*1.5*	*0.5*	*1.9*
Throw in open lot	*2.5*	*3.4*	*2.0*	*1.4*	*1.3*	*3.7*
None of the above	*33.6*	*35.1*	*32.8*	*46.7*	*33.3*	*30.6*

Trend Analysis - Environmentally Appropriate Methods of Disposing of Household Garbage

Table 37 below shows a comparison of 1998 & 2015, and explains responses to the question, about environmentally appropriate methods used to dispose of household garbage.

Table 37: Environmentally Appropriate Methods of Disposing of Household Garbage – 1998 &. 2015

Methods	*2015 Survey*			*1998 Survey*		
	Overall	*Male*	*Female*	*Overall*	*Male*	*Female*
Burning	*28.8*	*30.5*	*27.4*	*54.2*	*50.4*	*57.5*
Burying	*33.7*	*30.3*	*36.0*	*65.9*	*67.2*	*64.7*
Throw in gully	*1.4*	*0.7*	*1.9*	*1.8*	*1.8*	*1.7*
Throw in open lot	*2.5*	*3.4*	*2.0*	*2.0*	*1.7*	*2.4*
None of the above	*33.6*	*35.1*	*32.8*	*11.6*	*11.9*	*11.3*

Significantly, fewer respondents indicated that they would burn their household garbage in 2015, compared to 1998 (25-percentage point decrease). This was also the same pattern for burying garbage (32-percentage point decrease). There was also a notable shift (22 percentage points) in those who said they would use "none of the above". A larger proportion of respondents in 2015 indicated that they used "none of the above".

Question in relation to Table 38: "What do you usually do with your household garbage?"

A large proportion of respondents overall indicated that they did not separate their garbage, but put it out to be collected by the garbage truck (47.3%). This was followed by "burning" (27.8%), "separate", and "put out to be collected by the truck" (16.7%). About 6% indicated

"burying", 1.2% "throw in the gully" and another 1.2% "use some other method" (Table 38 refers).

Females were as likely as males to indicate that they did not separate but put out their garbage to be collected by the garbage truck (47.3 and 47.5% respectively), or that they burned their garbage (28.5 and 26.8% respectively).

Burning was significantly more likely to be reported by respondents in the rural areas compared to the other two locations; however, respondents in the KMA were significantly more likely to indicate that they did not separate, but put out their garbage to be collected by the garbage truck.

Table 38: Usual Methods of Disposing of Household Garbage by Gender & Location (Sampling Domain)

Methods	***Overall***	***Gender***		***Location***		
		Male	***Female***	***KMA***	***Other Towns***	***Rural Areas***
Burning	*27.8*	*26.8*	*28.5*	*5.5*	*24.0*	*35.7*
Burying	*5.8*	*7.2*	*4.7*	*0.0*	*5.2*	*7.7*
Throw in nearby gully	*1.2*	*1.3*	*1.0*	*0.0*	*1.4*	*1.3*
Separate and put out to be collected by truck	*16.7*	*15.9*	*17.5*	*23.0*	*15.4*	*16.1*
Don't separate but, put out to be collected by truck	*47.3*	*47.5*	*47.3*	*71.6*	*53.0*	*37.7*
Other	*1.2*	*1.4*	*1.1*	*0.0*	*1.0*	*1.6*

Personal Actions to Protect the Environment

Question in relation to Tables 39 & 40: "Which of the following actions have you personally taken in the last year in order to protect the environment?"

Thirteen (13) items were indicated and persons were asked to choose all that applied. Table 39 presents the respondents' responses of "yes" to the indicated items.

The most prevalent responses of "yes" greater than 35% were for the following three (3) items:

- I try to use less electricity (64.4%)
- I have planted trees (41.1%)
- I return glass bottles whenever possible (37.7%)

Apart from 22.7% indicating that, "I burn my garbage"; less than 20% of respondents answered "yes" to each of the remaining items.

Table 39: Personal Actions to protect the Environment

"Yes" responses to the following items	*Overall*	*Male*	*Female*
I have planted trees	*41.1*	*45.5*	*38.1*
I have spread garlic outside in the yard	*2.0*	*49.2*	*50.8*
I use biodegradable products whenever possible	*15.3*	*44.4*	*55.6*
I buy phosphate-free detergent	*6.5*	*5.5*	*7.2*
I return glass bottles whenever possible	*37.7*	*37.0*	*38.2*
I try to use less electricity	*64.4*	*59.0*	*67.9*
I use fewer chemicals in the garden such as insecticides and herbicides	*17.8*	*18.7*	*17.3*
I do not use aerosols containing CFCs	*11.3*	*11.8*	*10.9*
I do not buy certain products because of packaging concerns	*11.0*	*9.2*	*12.4*
I burn my garbage	*22.7*	*19.5*	*25.1*
I created/maintained a compost heap	*11.6*	*10.6*	*12.3*
I took steps to prevent soil erosion	*10.9*	*12.0*	*10.2*
I do not buy lobster in the closed season	*14.6*	*14.0*	*15.1*
Other	*2.4*	*2.9*	*2.1*

In Table 40 below, the most prevalent actions personally taken to help protect the environment were: I try to use less electricity, I return glass bottles whenever possible, I have planted trees, and to a lesser extent among the respondents from KMA—use of biodegradable products whenever possible, use of fewer chemicals in the garden (such as insecticides and herbicides), and not buying lobster in the closed season.

Table 40: Personal Actions to Protect the Environment by Location (Sampling Domain)

"Yes" responses to the following items	***Location***		
	KMA	*Other Towns*	*Rural Areas*
I have planted trees	*47.3*	*37.0*	*42.3*
I have spread garlic outside in the yard	*2.8*	*2.5*	*1.5*
I use biodegradable products whenever possible	*29.0*	*16.0*	*11.4*
I buy phosphate-free detergent	*9.8*	*7.3*	*5.1*
I return glass bottles whenever possible	*48.5*	*38.9*	*34.2*
I try to use less electricity	*80.7*	*61.9*	*62.0*
I use fewer chemicals in the garden such as insecticides and herbicides	*29.9*	*16.6*	*15.6*
I do not use aerosols containing CFCs	*21.9*	*11.3*	*8.6*
I do not buy certain products because of packaging concerns	*22.2*	*10.2*	*8.9*
I burn my garbage	*14.2*	*21.0*	*25.9*
I created/maintained a compost heap	*20.0*	*11.2*	*9.7*
I took steps to prevent soil erosion	*20.6*	*8.4*	*10.2*
I do not buy lobster in the closed season	*31.5*	*11.4*	*12.6*
Other	*5.4*	*2.3*	*1.8*

Recent Involvement or Action to Protect the Environment

Question in relation to Table 41: "In relation to protecting the environment, which of the following have you been involved with or done recently?"

Results on Table 41 showed that **f**or the most part, respondents could not identify with any of the options given, and indicated "none of the above" (41.6% of the times); however, a little more than one-fifth (22.6%) indicated that they 'had read an article/s to help them become more environmentally aware'. Small proportions indicated that they joined an organization that was involved with the environment (5.9%) or shared information about the environment on social media (7.7%). About 9% said that they supported an organization involved with the environment.

Table 41: Recent Involvements or Actions to Protect the Environment by Gender & Location (Sampling Domain)

Responses of "Yes" to the following items	*Overall*	*Gender*		*Location*		
		Male	*Female*	*KMA*	*Other Towns*	*Rural Areas*
I have joined or I am a member of an organization involved with the environment	*5.9*	*5.7*	*5.8*	*6.5*	*6.1*	*6.3*
I have shared information about the environment on social media	*7.7*	*8.5*	*7.1*	*18.3*	*6.3*	*5.9*
I have read an article/s to help me become more environmentally aware	*22.6*	*21.6*	*23.4*	*54.0*	*23.9*	*14.1*
I have supported environmental actions with money or time	*9.2*	*10.1*	*8.5*	*17.1*	*9.0*	*7.3*
None of the above	*41.6*	*42.2*	*41.5*	*20.4*	*43.2*	*45.8*

Actions within the Past Week Considered Helpful to the Environment

Question in relation to Table 42: "Can you name anything that you did within the **past week** that you think could be considered **helpfu**l to the Jamaican environment?"

Thirteen (13) items were indicated and persons were asked to choose all that applied.

Table 42 below presents the respondents' responses of "yes" to the indicated items.

The most prevalent responses of "yes" greater than 10% were for the following three (3) items:

- I try to use less electricity (60%)
- I have planted trees (20%)
- I return glass bottles whenever possible (17.9%)
- I burn my garbage (14.6%)

Less than 10% (0.8-9.4%) of respondents answered "yes" to the remaining items.

Table 42: Actions within the Past Week Considered Helpful to the Environment

Responses of "yes" to the following items	***Overall***
I have planted trees	*20.0*
I have spread garlic outside in the yard	*0.8*
I use biodegradable products whenever possible	*8.5*
I buy phosphate-free detergent	*3.3*
I return glass bottles whenever possible	*17.9*
I try to use less electricity	*60.0*
I use fewer chemicals in the garden such as insecticides and herbicides	*9.3*
I do not use aerosols containing CFCs	*7.8*
I do not buy certain products because of packaging concerns	*4.6*
I burn my garbage	*14.6*
I created/maintained a compost heap	*7.3*
I took steps to prevent soil erosion	*6.9*
I do not buy lobster in the closed season	*9.4*
Other	*2.2*

Actions within the Past Week Considered Dangerous to the Environment

Question in relation to Table 43: "Can you name anything that you did within the **past week** that you think could be considered **dangerous** to the Jamaican environment?"

Eleven (11) items were indicated and persons were asked to choose all that applied. Table 43 presents the respondents' responses of "yes" to the indicated items.

The most prevalent responses of "yes" greater than 10% were for the following:

- I burn my garbage (30.3%)
- Burn cuttings and grass from the yard (19%)
- Burn plastic (12.9%)
- Do not necessarily use biodegradable products (11%)

Less than 10% (0.5-9.1%) of respondents answered "yes" to the remaining items.

Table 43: Actions within the Past Week Considered Dangerous to the Environment by Location (Sampling Domain)

Responses of "yes" to the following items	*Overall*	*Location*		
		KMA	*Other Towns*	*Rural Areas*
Burn my garbage	*30.3*	*15.4*	*26.3*	*36.5*
Burn cuttings/grass from the yard	*19.0*	*6.9*	*18.1*	*22.5*
Burn plastics – e.g. Plastic bags, plastic bottles.	*12.9*	*9.1*	*14.5*	*12.9*
Cut down trees unnecessarily	*1.2*	*-*	*1.7*	*1.1*
Cut down trees for burning coal	*2.1*	*-*	*2.1*	*2.7*
Do not necessarily use biodegradable products	*11.0*	*38.9*	*8.2*	*6.1*
Dump garbage in gullies	*1.3*	*2.7*	*1.5*	*0.8*
Throw garbage on the streets/litter the streets	*2.1*	*5.0*	*0.7*	*2.3*
Use a lot of chemicals in the home	*9.1*	*25.3*	*5.8*	*7.4*
Use a lot of chemicals in the garden	*1.4*	*1.2*	*0.5*	*2.0*
Other	*0.5*	*1.4*	*0.3*	*0.4*

Perception of NEPA – Section 5

Agency with Major Responsibility for the Environment in Jamaica

Question in relation to Table 44: "Can you name the Government Agency which has the major responsibility for the environment in Jamaica?"

About one in every six respondent said, "Yes" (58.7%). Of those who said "yes", 52.4% identified NEPA as the responsible Agency. The actual results are presented in Table 44 below:

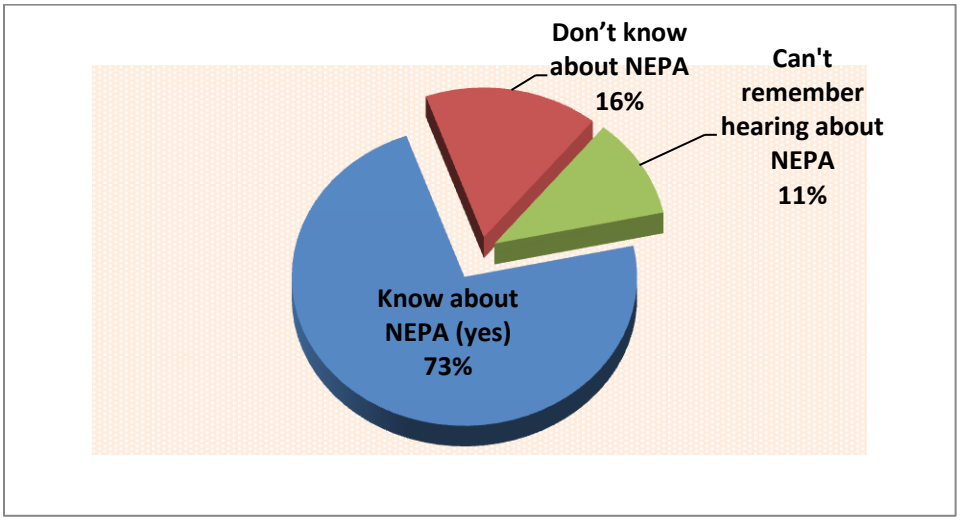
Table 44: Responses: Agency with Major Responsibility for the Environment

Responses	*Frequency*	*Percent*
Environment Agency	*8*	*.1*
Forestry Industry	*7*	*.1*
Jamaica Environment Agency	*7*	*.1*
Land and Environment	*11*	*.1*
Maritime Institute	*7*	*.1*
Ministry of Climate Change	*12*	*.1*
Ministry of Culture	*12*	*.1*
Ministry of Environment	*10*	*.1*
Ministry of Environment & Planning	*7*	*.1*
Ministry of Environment and Water Resources	*8*	*.1*
Ministry of Health	*36*	*.4*
Ministry of Health and Environment	*11*	*.1*
Ministry of Housing Environment & Climate Change	*8*	*.1*
Ministry of Land & Environment	*11*	*.1*
Ministry of Health	*5*	*.0*
National Solid Waste	*11*	*.1*
NEPA	*5,340*	*52.4*
NSWMA	*265*	*2.6*
ODPEM	*6*	*.1*
Parish Council	*19*	*.2*
Prime Minister	*15*	*.1*
RADA	*7*	*.1*
Solid Waste	*39*	*.4*

Question in relation to Figure 10: "Apart from today, have you ever heard of the National Environment & Planning Agency?"

More than seven of every ten respondents (72.8%) said "yes". A notably high proportion (16.3% said "no" and 10.8% said they "could not remember". Results are shown in Figure 10 below.

Figure 10: Ever Heard of the National Environment & Planning Agency?



Work Done by NEPA

'Question in relation to Table 45: "If '**yes'** to Question 39, which of the following work is done by NEPA?"

In Table 45 below, respondents identified 'protecting the environment' as work done by NEPA (68% of the times). The next most prevalent response was 'pollution prevention and control' (indicated 43.8% of the times).

Table 45: Work Done by NEPA by Gender & Location (Sampling Domain)

Work Done by NEPA	***Overall***	***Location***				
		Male	***Female***	***KMA***	***Other towns***	***Rural areas***
Protecting the environment	*68.0*	*68.7*	*67.3*	*70.5*	*68.6*	*66.9*
Prosecuting people who destroy the environment	*32.2*	*33.6*	*31.4*	*40.5*	*34.7*	*28.2*
Natural Resources Management	*30.1*	*26.4*	*32.9*	*41.3*	*33.1*	*25.0*
Land Use & Spatial Planning	*20.3*	*20.2*	*20.6*	*36.8*	*24.7*	*12.7*
Pollution Prevention & Control	*43.8*	*41.2*	*45.8*	*56.8*	*49.5*	*36.3*
Conduct public education/educate people about the environment	*39.1*	*37.9*	*40.0*	*55.3*	*43.9*	*31.2*
Other	*2.8*	*2.3*	*3.1*	*1.5*	*1.6*	*3.9*
Don't know what NEPA does	*8.1*	*5.6*	*9.7*	*7.0*	*8.3*	*8.2*

Thirty-nine percent (39%) of the times respondents said that NEPA's work was to "Conduct public education/educate people about the environment'. Responses are presented in Table 43 and Figure 24. Females were as likely to indicate protecting the environment as the most prevalent response as did respondents from three (3) locations. More females (9.7% compared to males (5.6%) indicated that they did not know what NEPA did. Comparison by location indicated that respondents from the KMA were least likely to indicate that they did not know what NEPA did (KMA (7%), other towns (8.3%) and rural areas (8.2%).

The following is a list of other work identified as being done by NEPA

- Bird shooting regulation
- Clean gully
- Crocodile rescue
- Environmental impact study
- Move garbage receptacles
- Plant trees; give trees to people
- Property inspection
- Protect coastal areas and wetlands
- Protect wildlife
- Remove crocodiles from gullies
- Replanting

Seen or Heard Anything about NEPA in the Past Year

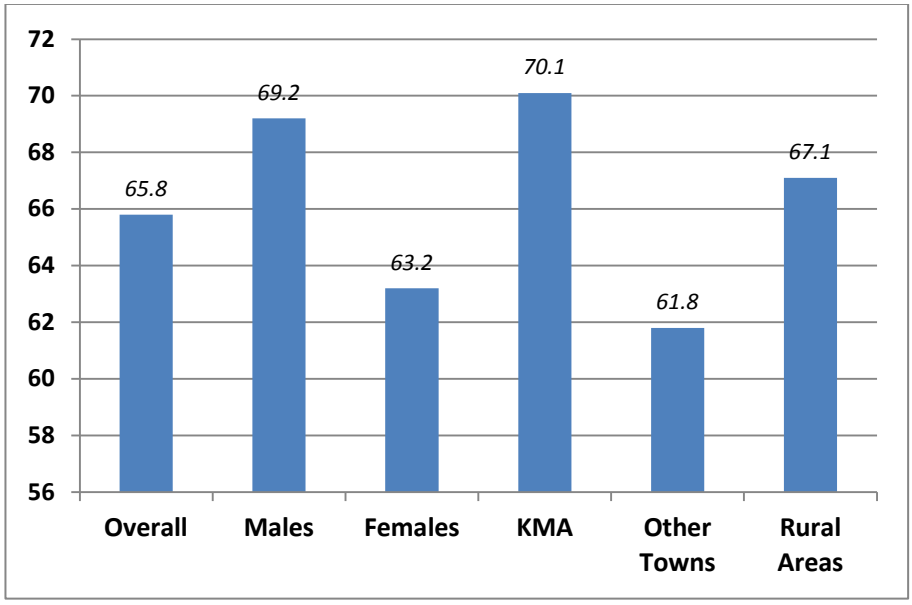
Question in relation to Figure 11: "Within the **past year** have you ever heard or seen anything about NEPA and its work?"

More than six of every ten respondents (65.8%) said "yes", they had seen or heard about NEPA and its work within the past year - (69%) of males versus 63% of females).

About 18% said that they had not heard or seen anything and 16% could not remember such.

Seven of every ten (70.1%) respondent in the KMA had seen or heard something about NEPA compared to 61.8% in other towns and 67.1% in the Rural Areas (Figure 11).

Figure 11: Seen or Heard Anything about NEPA in the Past Year?



Question in relation to Table 46: "If "yes" to **Question 41**: What have you heard or seen about NEPA and its work in the **past year"**?

Those respondents who had heard or seen something about NEPA were then asked to identify as many things from a list indicating what they would have heard or seen.

The things most often identified for the most part were news items on TV (45.6% of the times); advertisements on TV/Radio (19.6%); educational programmes on TV/Radio (16.9%); and public service announcements on TV/Radio (11%).

Most of the substantial situations indicated in which respondents heard/saw NEPA were related to the print or electronic media.

Table 46: NEPA and its Work in the Past Year

Responses of "yes" to the following items	***Overall***
News Items on TV/Radio	*45.6*
Advertisements in Newspaper	*11.3*
Advertisements on TV/Radio	*19.6*
Educational Programmes on TV/Radio	*16.9*
Discussion Programmes on TV/Radio	*12.8*
Newspaper Article	*10.5*
Letters to the Editor in the Newspaper	*1.9*
Postings/Articles on the Internet	*6.4*
Statements from NEPA on TV/Radio	*10.2*
Public Service Announcements on TV/Radio	*11.1*
Heard discussions about NEPA in the community	*5.3*
Other	*2.0*

Impression of NEPA and its Role in Protecting the Environment

Questions in relation to Table 47:

a**. "**Do you think NEPA is doing a good job in protecting the environment in Jamaica?"

b. "Do you think NEPA is doing a good job in educating/informing the Jamaican public about the environment?"

c. "Do you think NEPA can do more to help protect the environment?"

Respondents were asked to give their impression of NEPA with respect to its role in protecting the environment – 52.7% of respondents felt that NEPA was doing a good job in this regards. Sixteen percent (16%) said "no" and more than three in every ten (31.5%) were unsure, (Table 47 refers).

When asked whether NEPA was doing a good job in educating/ or informing the Jamaican public about the environment, only 47% agreed (said "yes"), while more than one-fifth (23.1%) said "no" and 29.9% were unsure.

Most respondents (60.8%) overall felt that NEPA could do more to help protect the environment. 6.5% however said "no", but 32.7% were unsure. Suggestions made by the respondents in this regards are presented in Table A10 in Appendix 26.

Table 47: Impression of NEPA and its Role in Protecting the Environment

Impression of NEPA	***Yes***	***No***	***Not Sure***
Do you think NEPA is doing a good job in protecting the environment in Jamaica?	*52.7*	*15.8*	*31.5*
Do you think NEPA is doing a good job in educating/informing the Jamaican public about the environment?	*47.0*	*23.1*	*29.9*
Do you think NEPA can do more to help protect the environment?	*60.8*	*6.5*	*32.7*

NEPA's Public Education Programmes and Activities – Section 6

Knowledge of and Participation in Events

Question in relation to Table 48: "Are you aware of (**heard of, or know about**) any of the following events, and if so have you ever participated in any of them?"

Responses to those answering "yes" are presented in Table 48 below: Respondents (for the most part), were aware of all events mentioned. More respondents were aware of the International Coastal Clean-Up Day (53.2%) than any other event.

The next most prevalent event identified was National Environmental Awareness Week (43.4%); followed by World Wildlife Day (20.3%) and the Annual NEPA Display at Denbigh

(21%).Even though more than 20% of respondents were aware of the key ones mentioned above, only 2-6% had ever participated in these events.

Very low participation was indicated for these events overall (1.1-6.7%

Table 48: Knowledge of and Participation in Events

Items	***Are you aware of event? (yes)***	***Ever participated in event? (yes)***
1. World Wildlife Day	***20.3***	***2.0***
2. National Environmental Awareness Week	*43.4*	*5.2*
3. International Coastal Clean-up Day	*53.2*	*6.7*
4. International Ozone Day	*11.1*	*1.1*
5. World Town Planning Day	*7.8*	*0.9*
6. World Wetlands Day	*12.6*	*1.4*
7. World Water Day	*12.7*	*1.8*
8. International Day for Biodiversity	*5.7*	*0.6*
9. Annual NEPA Display at Denbigh	*21.0*	*3.1*

Knowledge of and Use of Media

Question in relation to Table 49: "Are you aware of (**heard of or know about**) any of the following media through which NEPA offers educational and other services to the public; and if so have you ever used any of those services"?

Table 49 shows that a fairly large proportion of respondents were aware of Website (33.0%), Facebook (27.5%) and Library (22.5%; as media through which information is disseminated by NEPA.

The most prevalent media identified by respondents, as being used were Website, Facebook, You Tube and to a lesser extent Twitter and Instagram. The overall usage pattern indicated was very low (2.5-13.5%).

Table 49: Knowledge of and Use of Media

Media	***Are you aware of media? (yes)***	***Ever used any of the services? (yes)***
1. Library – Document Centre	*22.5*	*8.7*
2. Website	*33.0*	*13.5*
3. Public Education Department	*14.4*	*3.3*
4. Facebook	*27.5*	*15.3*
5. LinkedIn	*5.7*	*2.5*
6. Twitter	*13.9*	*6.1*
7. Instagram	*13.2*	*5.9*
8. YouTube	*18.8*	*10.5*
9. Flickr	*5.1*	*2.7*

B. Qualitative Findings

Focus Group Findings 1 – Mico Practicing Primary & Junior High, Kingston

A focus group discussion (FGD) was conducted with 5 students from Grades 8 & 9 - 3 males and 2 females from the Mico Practicing Primary and Junior High School in Kingston.
They were all participants in the Environmental Project implemented by NEPA in 2014.

The following excerpt was taken from the final report by NEPA (2015) on the project specified hereunder:

"*The Public Education and Corporate Communications Branch (PECCB) of the National Environment & Planning Agency (NEPA) engaged with representatives of the Primary and Junior High School in July 2014 to select a project that NEPA could partner with them to plan and implement during the 2014-15 school year."*

"The school agreed on the re-establishment of a vegetable garden with a recycle component using organic matter. A rainwater-harvesting component was subsequently incorporated into the project. This was because during a visit rain fell heavily and the idea was formed when water was observed going to waste."

"The Mico environmental project became one of the Key Performance Indicators for the Agency for FY 2014-15. The school administration and NEPA formally established a partnership on September 29, 2014 to undertake the project. The project commenced officially on 8 October 2014 when students of the Environmental Club were formally introduced to the NEPA team."

This focus group discussion, which was conducted on this project, was done in order to obtain information on the effectiveness of NEPA's educational programmes.

A. Lessons learnt from the water recycling aspect of the project

In relation to lessons learnt from recycling water, the responses were as follows:

1. "Do not waste it (water)"
2. "Do not contaminate the water, as others use it and can get sick"
3. "Water is essential for life and if it gets contaminated others can't use it."
4. "Always conserve water and don't pollute it with lots of harmful chemicals."

B. Lessons learnt from the field trip to Port Royal (Only 3 participants in the FGD had gone on the field trip)

1. "It is important to keep animals safe."

2. "It helps us to understand how to help maintain life cycle"

3. "I understand better how we can save the animals' lives"

A. Lessons learnt from the vegetable garden aspect of the project

Participants were able to articulate important lessons learnt from the vegetable garden aspect of the project. Below are enumerated a fairly wide array of responses"

1. (About) plants: "water and care for them by taking off the dead leaves. Spray pesticide on the ones with pests and these will prevent the pests from going onto others.
   The lesson I have learnt is how to give plants the right things."
2. "Do not damage trees. Learn to keep the environment clean"
3. "In the future, put gardens in a safe place from pests. If pesticide is used to kill insects, it won't damage the plants. Pesticide can be sprayed, but you must hold the plant a particular way so that the spray doesn't get onto other plants."
4. "Garlic water can protect plants from pests."
5. The Health and Wellness Teacher gave a different activity in taking care of the vegetable garden and plants; for example, "look for bad leaves (on plants) and remove them."
6. "Do not spray pesticide on plants you are going to eat. Use water and not chemicals at all times on the plants. If insects are on plants use water."

B. Lessons learnt from the compost activity

The lessons from the compost activity are explained by direct quotes from participants below:

1. "Compost is very good for plants. Not everyone throws away everything, but use for compost."
2. "At club time, NEPA came and used banana & mango skin and said compost is good as it helps plant to produce food."
3. "In future life, it shows things to do to fertilize plants that are nutritious. Compost is good; it helps plants to produce food."
4. "I learn to recycle banana skins and use to fertilize to get more food."

C. Usefulness of environmental project to the individual (Student)

1. "When I leave MICO to a different school I can join a project and help others – have the knowledge."
2. "It gives me knowledge, something to share and help people around their garden and prevent them from doing the wrong. For example, if insects are on plants, they can damage the plant, but because I know, I can tell them how to treat plant gently (and get rid of the insects)."
3. "I get some of the food from the garden."
4. "If I go to a different school and they are doing the wrong thing I can show them the right thing, because I have more knowledge."

D. Usefulness of environmental project to the Environmental Club at school

1. "Club members learned new skills, like helping to protect the trees and the environment".
2. "It helps me to work better in groups and as a pair."
3. "Helps us to work and unite together."
4. Helps club members to get breakfast, give chef food so we benefit.
5. "It helps other club members to come and join – even leave their club and join Health and Wellness Club."
6. "Makes the club popular. Gives more students to have impression to join; NEPA come in at devotion and talk and we did not know they were going to give certificates. I was amazed when my name was called; as a result of that visit and other activities, children run come to join the club."

E. Usefulness of environmental project to the school/How it has helped the school

1. "It is good for the breakfast programme"
2. "Some students don't have food at home, so we reap vegetables and take home. Help to provide breakfast for children at school".

3. "Show others when running up and down instead of playing too much, to do something like that."

F. Knowledge gained from participating in the project

1. Some participants expressed the view that they didn't know that banana and yam skin were good to make compost.
2. "When we have plants at home we would just come out and grab the plants, the project helps me to be gentler to the plants."
3. "I learnt that Jamaica has mangroves and that fish can skip on water."
4. "I know everything before; I was in a similar club in another Primary School."

G. What if anything are you doing differently?

1. "When I buy banana I don't throw away the skin but use it and egg shell to fertilize plants."
2. "To have patience when working with plants."
3. All participants reported that they were taking better care of plants in their surroundings
4. Participants committed to tell other students to join the club, and said that they would be willing to answer questions posed by these and other students.

H. Below are the final words participants spoke about the project;

1. "Interesting – learnt from composting"
2. "Encouraging"-
3. "It was useful because it helped me to be gentle and pleasing to plants"
4. "It was fun to work on the project"
5. "It will be helpful in life later"
6. "We want to continue working on other aspects of the project. The teacher gives duties and we like that."

In relation to their general feelings towards the project, it was generally believed that it was good and it helped them to feel more mature and confident. One student said that he/she felt like a leader and was willing to help the younger ones coming into/joining the club or newly coming to the school. Another said, “I am glad I was a part of it.”

Regarding their responses, it should be noted that respondents were not prompted or impelled in any way to give particular responses. They have learnt in some way or the other as their responses have indicated. They explained the usefulness of the project to themselves, other students, the school and wider community; valuable knowledge has been gained to benefit them in their quest for making themselves, the school and others better off; and of course, they have changed their behaviour and outlook towards the environment.

It is therefore safe to conclude that the project was useful to the participants, based on their responses and expressions. They seemed to be genuine in their quest to be honest in their responses, as they were not briefed on the questions to be asked. Additionally, one could venture to say that those valuable lessons were internalized. Additionally, it is important for persons to internalize important messages and experiences to help in the behavioural change that is needed in any educational approach designed to such an end.

Focus Group Findings 2 – IWCAM Portland

A focus group discussion (FGD) was conducted in Port Antonio, Portland with 10 representatives – 6 females and 4 males - from the Drivers’ River Watershed Project, which formed part of a project, started in the Caribbean Small Island Developing States including Jamaica, in 2005.

The following excerpt was taken from the final report by NEPA (n. d.) on the project specified hereunder:

“*The Drivers River Watershed Project is among eight other demonstration projects across the Caribbean. The Watershed, which is rated as one of the least, degraded in the country and was*

chosen to help develop Best Management Practices in environmental habits and activities. These are identified, planned and implemented through a participatory process involving agency and community partnerships. Four committees have been formed to ensure the adaptation and implementation of these practices (Governance & Enforcement, Sanitation and Sustainable Livelihood, Environmental Monitoring and Public Education and Awareness). All Stakeholders are given the opportunity to choose the committee they wish to work with, based on special interest or natural talent. Community members are not allowed to be on more than two committees to ensure maximum participation and to avoid clashes. All of these committees report back to stakeholders at the monthly Stakeholders Meeting."

The Integrating Watershed and Coastal Areas Management Project (IWCAM), the overarching project, which was implemented as an environmental project in selected communities in the Drivers River area of Portland was used in this research to analyse its educational utility in the communities in which it was implemented. So persons who sat on the four (4) Committees - Governance & Enforcement, Sanitation and Sustainable Livelihood, Environmental Monitoring and Public Education and Awareness – were selected to be part of this focus group discussion (FGD).

Participants were generally very expressive in articulating their responses to the questions asked. The enthusiasm (another area that was observed keenly by the moderator), was also seen and could almost be touched.

One would get a sense that, generally, participants took it as a pleasure to work on the IWCAM Project, although they had both negative and positive experiences, with the latter certainly by far, outweighing the former.

This focus group discussion, which was conducted with key participants on this project, was done in order to obtain information on the effectiveness of NEPA's educational programmes.

This of course is interpreted by the author as an educational project, based on its various components, which provide many and varied educational experiences.

A. Lessons learnt from working on the IWCAM Project

In relation to lessons learnt from the project, there was no exception to participants' enthusiasm and expressiveness in voicing their opinions and ideas. The areas selected came from a careful analysis of the responses given. These are enumerated in the themes/subsections below:

1. **Water** – Participants expressed lessons learnt from; training about watershed areas, keeping rivers and gullies clean, not destroying coral reefs (especially by fishermen), where to fish, keeping the mangroves clean, cleaning the rivers and the coasts, and helping to identify the watershed areas,

2. **Land** – In this area, participants expressed lessons learnt from; planting trees in order to preserve the land and for aesthetics; that rocks, trees and everything are good for the environment, not to burn coal, no burning at all on the land, keeping trees to prevent erosion, planting coconut trees on the beach with help from RADA . 300-400 coconut trees were planted and all died from a "yellowing" disease; however, with consultation from RADA, the new ones that were planted are growing fine.

3. **Education** – Great lessons were learnt through educational experiences, and the various trainings conducted. Training was a feature of the project. There was training in water sampling, environmental matters, project development/, and writing a proposal for funding, among others. One participant stated that each community had different educational needs, and that garbage was similar in all communities, but other needs differed and must also be met. Generally, they saw the importance of education and training; and expressed the wish that both education and training could continue. One participant remarked, "Education must be on-going in order to effect lasting change"

4. **Farming** – Some important lessons were also learnt in this area, such as how to engage in proper farming practices, no burning on the land, no spraying, (use of organic fertilizer was best), how to landscape, how to prevent erosion, how to train farmers re - proper planting, and how to do a marketing plan.

5. **Economic** – They learnt that in order to get citizens to engage in behaviours not detrimental to the environment, (particularly of not burning coal); they could give them chickens to raise and a stipend to aid in the activity. Farmers were also, given grants, seedlings, and other crops to farm.

6. **Garbage Disposal** – Participants mentioned important lessons learnt regarding proper garbage disposal and how proper garbage disposal benefitted the environment.

7. **Team Work/Working on the Committees** – Important lessons were learnt from the team concept, such as- the benefit of teamwork/a good sense of teamwork. Participants also formed lasting friendships, which will be beneficial to their commitment to protecting the environment. They referred to that state as, “Friends for life”.

8. **NEPA** – Some lessons learnt were related to NEPA, which was perceived negatively, but which got a lot of praise and respect since the project. One person commented that when persons saw the practical benefits, their concept of NEPA had changed. Participants now separate garbage, prepare it in bags for the truck to collect, use the skips and encouraged its use. “NEPA was now seen as not the enemy.”

9. **Communities**– Comments regarding lessons from working in the communities. Great change can happen and has happened, and people will cooperate when they are organized and can see results.

A. How useful was the Project/How has it helped you, Parish, Community?

The usefulness of the project was expressed generally in terms below:

1. **Generally** – It changed community thinking, opened up the eyes of many persons in the community, cleaned up the community, educated the people, incorporated other community organizations and a benevolent society developed a project for recycling of plastics. Participants were able to develop a plan to complete a trade centre, a post office, and a library in the community. All this happened because of the IWCAM Project. The farmer's market concept also came out of the IWCAM Project.

2. **Economic Activity** – NEPA gave persons chickens to raise and they also got stipend to help in raising the chickens. Those persons would be required however, to stop the coal burning, as it was an economic activity. Farmers were given grants, seedlings, and other crops to farm.
3. **Environmental** – The environment benefitted from clean-up day activities, as there was better awareness of garbage disposal concerns and coal burning ceased. There were fewer "gun-men" in their communities (gunmen in this context meant fishermen with spears). Only two remain in the community. Most of them are now from outside, and that the community is trying to stop.

4. **School Health** – There were debates in high schools, cassava-planting day in schools, and some schools benefitted from bathroom facilities. Two schools were painted, there was an Environmental Expo & Sports Day in one school and an Earth Day celebration was implemented. RADA helped in the schools' health projects re tree planting, how to keep the school garden clean and how to dispose of garbage. During the Summer Camp, school children were taken to the Marine Park in St. Ann & the Green Grotto Caves, at the end of which, each child went home with a gift.

5. **In the Community** –One person, remarked; "RADA has played a vital role in the project". There was a Fair Way Beach function, farmers' training, tree planting (coconut, mangoes, June plum), planting of pineapples, river cleaning and garbage disposal. Participants spoke about community outreach/public education of community members, and benefitted from a visit to a weather station where they were able to read the weather and send information to the Meteorological Office. They also benefitted from RADA, as they got some (farming) tools from the project. Farmers in one community still have group meetings as a result of what was started by RADA.

B. What do you know now that you didn't know before?

The more popular responses to the question were as follows:

1. "Do separation of garbage".
2. "Burning of garbage; not doing it now".
3. "Not to create fires in the community".
4. "How to do compost/mulch".
5. "More aware of the work of other related Agencies such as the Health Department, RADA, the Police and Community Organizations".
6. "The compost thing: I tried it before and it never worked, but now I know the correct way to do it."
7. "I am now able to speak to people about their garbage and other things.
8. "I encourage them to take on an environmentally friendly approach to dispose of garbage."
9. "Learnt composting from NEPA/to use organic fertilizer, not to burn trees or plants, learnt to use leaves around plants as fertilizer".

C. Attitudes & behavioural change: what are you now doing differently?

"In the two communities I worked with, you can now see differences", remarked one participant. "People stop throwing garbage through the window while driving, they put

it in bag and take it with them, and people think about the environment. They would think about planting trees."

2. Another remarked, "people don't dump as before, they put them in bins now".

3. "I too separate my garbage.

4. We belong to a Benevolent Society and we have an Environmental Health Committee within that organization.

5. We have members that work with us as far as the environment is concerned, so we are really into trying to keep the environment clean"

6. "I encourage them (citizens) to take an environmentally friendly approach to dispose of garbage."
7. "Report people to the Health Department".
8. "Report people who dirty the river with their faeces".

The lessons learnt that were expressed by participants, were deep and important to the participants themselves; such as lessons from educational to economic, to environmental, to social and other aspects of life. They were enthusiastic in enumerating those lessons, not only for themselves, but also for the communities and other geographical areas not within their confines.

Likewise, the usefulness of the project was seen to be far and wide in its effects. Individuals, Communities, Community Organizations, and the Parish in general were all included in its usefulness. One important aspect was what they called, "...a change (in) community thinking" and, "opening up of the eyes of many persons in the community". That was very important in the process of change and positive community engagement.

Finally, a change in knowledge, attitudes, and practices are major keys to changing (generally), any behaviour. This, of course can be applied more specifically to behaviour in this environmental project. The participants themselves will be better for it, as well as the Communities, Community Organizations and the Environment.

SECTION FOUR

DISCUSSION

Study Limitations

1. **Length of Questionnaire:** Respondents complained about the length of the questionnaires, as a result of which, time spent on the questionnaire might have worn out many of the respondents and contribute to mental fatigue during the process of answering the questions. The questionnaire was estimated to take about half an hour to complete, but took longer in many instances.

2. **The exclusion of school age children, (6 to 17 years old), from the survey:** Valuable data could have been had from this age cohort, but it was excluded from the quantitative aspect of the exercise.

3. **Incompletion of exercise at 17 (EDs)**: These EDs were not completed owing to illnesses of interviewers, death and illnesses of loved ones, and volatility of (especially), inner city areas, i.e. both violence and politics contributed to the scenario.

4. **Length of time for the entire exercise:** The study was originally intended to be conducted in ten (10) calendar months, but was limited to eight (8) months. The interview period was from October 13, 2015 to December 11, 2015(approximately two months), a very short period, which was originally slated for about three to four months. This of course necessitated rapid speed in completing the process, and subsequently had negative implications for the entire process. Of the 17 EDs that were not completed, with time constraint being an important and major contributor, more could have been completed had that not been in the picture.

5. **Response rate:** STATIN estimated the response rate to be somewhere in the region of 80%, however, it was about 75%. This to a small extent may/could have negatively affected the generalizability of the study.

6. **Inclement weather** on the north east coast to a limited extent hampered the process on that side of the island.

7. **Call-backs** - Several residents who indicated a willingness to participate in the survey requested interviewer call-backs; however, due to the time constraints especially, and limitations in relation to many interviewers having to traverse extremely wide expanses, some call-backs were missed. Additionally, a few could not be carried out.

8. **Data from the focus group discussion** (FGD) at Mico Primary and Junior High School was partially compromised owing to the non-functionality of the mini tape recorder during the retrieval process. This posed great difficulties for retrieval, even after expert help. The physical/hard recorded script used by the co-moderator was the sole source of retrieving the data for this aspect of the study. Some valuable details were therefore left out as a result of the malfunction of that piece of equipment. In order to prevent a repeat this, the recording of the FGD at Portland was done by a digital recorder and saved to a lap top computer.

Socio-demographic Information

Twenty-four (24) of the 72 EDs that were selected, (i.e. 17.3%), were from the KMA (Table 1), and of that 24, only 42% was covered in the survey. Some of the reasons for this are explained in the limitations. Political volatility and violence, two of the major contributing factors for the non-completion of the survey in some of those areas, are serious concerns to be addressed if the country is to move forward in addressing the environment agenda. The views of those selected in the sample are not a part of this survey. It would seem to have implications for

NEPA's programmes and activities if accessibility is going to be sacrificed due to no fault of their own.

In the 1998 study, 70.4% (Table 2.1 of the 1998 study) of the sample was in the childbearing age group, while in this study it is 58.3% (Table 5). This of course is saying that the responses in this study are more evenly spread among the child bearing and non- childbearing age groups.

It is significant to note that the distribution of responses by location (sampling domain), was close to 53% (Fig. 1) in the rural areas. Therefore, there is the possibility that the responses may reflect slightly more rural views, more so than the other rural towns and the Kingston Metropolitan Area combined.

A majority of the respondents had exposure to formal education. One can assume that their exposure to formal education would expose them to basic environmental concepts such as; don't litter, among other things. This is not for one moment excluding those who did not attend school from that exposure, because parents instil in their children, values of the cleanliness of the environment at home. Other Agencies and organizations in the society perform that role also.

Knowledge of the Environment

It is to be noted that on Table 11, 10.1% of respondents could not express their understanding of the term 'environment'; or to be more accurate, they said that they did not know. Some attention must be paid to this segment of the population whose understanding of the environment seems to be vague. It can be assumed to a limited extent that a better understanding of the environment may lead to more protection of it; however, knowledge does not always convert into practice in many instances. This does not however rule out the importance of knowledge. On the other hand, not understanding or knowing the meaning of the term could be indicating that they did not understand the word itself. If that is the case, then some work still needs to be done in that area.

In addition, their lack of understanding of its meaning would certainly affect their responses to other related questions, which require some kind of understanding about the environment. For

example, a question such as, *"What do you personally think is the major issue affecting Jamaica's environment?"* For those whose understanding of the term environment meant the community, this interpretation naturally would go into the responses in relation to issues affecting the environment to mean issues affecting the community. Of course, one could stretch ones' imagination to interpret, in a similar way, other responses to questions, which speak about the environment.

In a similar vein, responses of "don't know" in other aspects of the knowledge section of the questionnaire may have similar implication; that of respondents probably not having the basic intellectual tools to help in protecting the environment. "Don't Know" features heavily, in relation to the weight of the responses, and the fact that ignorance to some extent is implicated in other responses. These and responses in relation to the most threatened aspect of Jamaica's environment (Table A4 in Appendix 22), the impact of selected items on the environment (Figure 5), contribution to air pollution (Table 16), pollutants in motor vehicle exhaust (Table 21), and other questions about the environment reflect some form of limited knowledge of the issues raised.

In response to the question about the major issue affecting the environment, as reflected in Table 12, the most prevalent response, "*garbage disposal*", seems to suggest that respondents really and truly have some kind of experience with the perennial problem of garbage disposal. Table 14 in which is seen "household garbage" as having the greatest negative impact on the environment, seems to cement this position, and the proportion of those with that view has increased since 1998 (Table 15). It is a feature of the country's environmental landscape; (that of improper garbage disposal on many levels), which figures prominently in respondents' day-to-day experiences. One can hope that the powers that be are committed to designing a better solution to the problem by taking a more focused approach to that end. It's not an easy problem to solve; it's a worldwide one, but careful scrutiny of the solutions elsewhere would be instructive.

Automobile emissions came up as a major contributor to air pollution (Tables 16 & 17); but the proportion decreased in 2015 versus 1998 (Table 18). This certainly is a negative trend. One can assume that the fact that more persons are owners and operators of motor vehicles in 2015 as opposed to 1998 seems to "blind" them to the reality of this phenomenon as a huge problem. The contiguity to a problem can have a blinding effect, especially if it means that the cost of that effect may have to be borne by the individuals implicated. Further analysis of this situation is needed.

In the same vein, knowledge of the pollutants in motor vehicle exhausts has decreased somewhat in 2015 in relation to 1998; although, in some instances there were slight increases (Table 21). In an age when more persons own motor vehicles and greater access to information is available (information on the Internet, more discussions in the media, among others), this is a very worrying trend. Much more needs to be put into this area of environmental education, and of course, more analysis of the situation is necessary.

The low level of knowledge with respect to what negatively affects the quality and quantity of Freshwater for drinking (Tables 23 & 24) is significant in relation to what an individual can do to minimize some of those effects. In relation to the quality of Freshwater for drinking, (littering, deforestation, and the use of pesticides by farmers), there are things that the ordinary man can correct in his/her day-to-day actions. With respect to the quantity of Freshwater for drinking, efforts will have to be made to make persons more aware of contributing factors within their grasp, such as the relationship between the lack of adequate rainfall caused by deforestation, as a result of his/her actions. Deforestation is caused by citizens cutting down trees for the burning of coal and other uses, especially agricultural use (in many instances).

Attitude to the Environment

Concern for the environment is an important factor in behavioural change and certainly has improved in a real way (Tables 25 -29 & Figure 9). The seventeen (17) year comparison – 1998 versus 2015, is a real eye-opener in favour of 2015, with a significant increase in behavioural

change. This is a positive trend that needs to be encouraged in no uncertain way. More work still needs to be done however, as the negative attitudes, which also showed a minutely small change in favour of 2015 (Table 27), still exist and need to be worked on (by those who have no concerns for the environment and those who have few concerns). In the 2015 survey, these two areas no concern for the environment and few concerns), combined, show 19.1%, a negligible decrease over 1998 figures of 21.1%. The level of concern is critically important, because if one has that real concern, one will be predisposed to seek to act on that concern for the better.

With respect to the data on Table 28 that suggests that, "concerns… have increased significantly over the last five years" in favour of the KMA, as opposed to those of other towns and rural areas. One would think that if the head office of the NEPA is situated in the metropolitan area, then its proximity to its citizens would be an important factor to consider in this particular scenario. More importantly however, is the fact that probably more and larger environmental aberrations have been experienced or exposed in the area, and therefore the citizens are more concerned. It is important to understand what transpired during that period which would spark that level of concern in its citizens.

Similarly, the individual's effect on protecting the environment shows a positive trend over the years (Table 30) as well as the importance of the environment to the quality of life (Table 32). These are all positive and must be focused on when designing any educational intervention. Much effort though must be put into that design; for those who believe that they have minimal or no effect on the environment, and the few who believe, and who express neutrality that the environment is not important to their quality of life.

Respondents' attitudes with respect to practical things that they are willing to engage in to help protect the environment are commendable, based on as the "yes" responses indicates in Table 33. The "no" responses are worthy of note however. Although in smaller proportions, for persons who are not sure, attempts must be made to "take them off the fence". Interventions must therefore be designed to such an end. The attempts at practical approaches will to a large

extent influence their attitudes. It is to be noted that persons in this category may not necessarily be as obstinate to engage in environmental protection as those in the “no” category.

The above-suggested solution may be relevant to respondents’ willingness to change their lifestyle to help protect the environment. In comparing the years, the trend is positive and that “willingness” may just be the rallying point in the entire process of behavioural change. It’s a difficult process, that of behavioural change, but it has rewards for future benefits.

Practices in the Environment

Burning of garbage is a poor practice and an inappropriate one to be engaged in as it is dangerous to the environment and its protection. It is indicated as a prominent method of disposing of household garbage in this study (Tables 36 - 38). It is the number one method, especially in rural areas as seen on Table 38, and it features prominently as is indicated on Tables 40 - 43. Collection of household garbage is less sustained and less organized in these areas, as compared to other towns and the Kingston Metropolitan Area (KMA). In many instances, people burn garbage because it is the better option available to them, as there is no organized collection available and no collection in many cases. It is to be noted also that people engage in this practice not necessarily to destroy the environment, but as a result of expediency and ignorance. Expediency, because people do it to preserve the aesthetics of their environment, to get rid of rodents, roaches, flies and other vectors of various diseases; ignorance, because many persons are unaware of the dangers that burning garbage may cause to the environment. In all of this, a way has to be found to influence the powers that be to organize a more rigorous garbage collection programme for the entire country.

Personal actions like planting of trees, using biodegradable products, creating compost heaps, sharing environmental information, and becoming part of Environmental Clubs and Associations among other similar actions explored in this study, are all positive ways to be engaged in environmental protection. Some respondents have expressed themselves as

engaging in these actions and some to the contrary. A good focus on the negative practices will have to be looked at (burning of garbage, burying of dangerous items in the environment, throwing of garbage in gullies or open lots), among other actions. On the other hand, there needs to be sustained education of the public on; CFC's role in environmental pollution, use of aerosols, role of Phosphate-free detergents, and the role of the community in environmental protection, as can be seen in becoming part of environmental groups; or for existing organizations to adopt an environmental protection agenda.

Perception of NEPA

Generally, the overall perception of NEPA is positive, as shown in Tables 44 - 49 and Figures 10 &11. Most persons know that NEPA exists and has major responsibility for the environment and they generally know what it does; but the views of the minority are also important; their answers to many of the questions were negative. Some have never heard of NEPA, some felt that NEPA was not doing a good job in protecting the environment, and others felt that the organization should be involved in cleaning gullies.

Print and electronic media featured heavily in the knowledge/perception of the NEPA. Here, there is room for improvement, e.g. some face-to-face interventions can do more to bring NEPA closer to the people in the community.

Generally, it may be necessary to establish more localized NEPA offices, in at least parish capitals or in "regional capitals", in order to cater to more localized community needs and interventions in these areas.

NEPA's Public Education Programmes and Activities

Knowledge of the events mentioned in Table 48 was high, but participation in these events was very low. These events must have been organized from a level where there was good publicity; however, the important part of the equation is the involvement of the populace in these activities.

In order for environmental responsibility to be encouraged and for it to be a part of the lives of individuals, persons have to be involved in meaningful ways. This is one area for improved involvement of citizens. These commemorative occasions must be more localized and must form part of a more sustained programme and be implemented in the community or other organizations, and be owned by them.

In relation to the knowledge and use of NEPA's media, the awareness versus the use was similar to the commemorative events mentioned above, as a larger proportion of persons were aware of these resources than those who had used them.

Much work has to done in this area, to get more persons to use the available media. It should be noted also that the Website, Facebook and YouTube were mostly used. This situation may not be a surprise, as persons always utilize the most popular mediums to get information they need, and to be entertained. It is an indication that more effort needs be placed on that aspect of NEPA's educational programmes and activities. It certainly will be more rewarding.

Conclusions

Knowledge of the Environment

To a great extent, a predominant proportion of respondents had a fair knowledge of what the environment was. The most prevalent response was "the surroundings", given by 53.4% of respondents. Among the other prevalent responses were; "everything around us, around you, atmosphere, and keeping the surroundings clean".

The most prevalent responses among the varied ones, in relation to respondents' thinking about the ***major issues affecting the environment*** were "garbage disposal" given by 27.3% of the respondents, "pollution" given by 15.2% and "don't know" given by 6.3%. In another question, respondents also indicated that "household garbage" had the ***greatest negative impact on the environment***. This response was given by a reasonably large proportion of those

respondents (33%). Garbage disposal was the number one response, probably because residents had more intimate dealings with this aspect of the environment.

Water and water systems, air/atmosphere and land, altogether formed 27.9% of the responses, the most prevalent ones, in relation to the most threatened aspect of the Jamaican environment.

With respect to the rating of the ten (10) items which were to be ranked as having the ***most tremendous negative effect on the environmen***t; again, household garbage (22.6%) came out on top as the highest ranked item. The fishing industry got the smallest ranking at 5.1%. Conversely, the data showed that 28.5% of respondents indicated that the fishing industry had the least negative effect on the environment. One can venture to assume that many respondents were not too acquainted with environmental problems experienced and caused by workers/fisher folks in that industry.

With respect to the rating of the ten (10) items which were to be ranked as contributing to air pollution ,the question saw 74.9% of respondents indicating that 'burning refuse/ rubbish' was the major contributor. The second most prevalent item to this was 'automobile emissions', which saw 60% of respondents indicating that it was a major contributor to air pollution. These, of course are two important elements to be considered/emphasized and cemented among the population; however, persons who felt that those two issues and the other issues indicated were of minor importance, or those who did not know, must be focused on, as the real problem lies there.

The proportion of respondents who indicated 'automobile emissions' as a major contributor to air pollution decreased from 70.4% in 1998 to 55.9% in 2015. With the availability of the internet, in the information era, and more cars being on sale and available on the Jamaican market, one would assume that people are more interested in and by extension more knowledgeable about the dangers posed by auto emissions.

A higher proportion of respondents in 2015 identified four (4) items that were not pollutants in automobile exhaust emissions when compared to 1998. They were; oxygen, arsenic, tin and iron oxides; however, for those correctly identified as major pollutants, a slightly higher proportion of respondents in 2015 identified carbon dioxide, carbon monoxide, sulphur oxide and nitrogen oxides as major pollutants. When the correct responses only are considered, a considerably high proportion of respondents continue to indicate that they did not know which items were pollutants in motor vehicle exhaust emissions. The average proportion of responses of 'don't know' decreased slightly from 56% in 1998 to 47% in 2015; a generally mixed trend overall, but more on the positive side.

In relation to what negatively affects the ***quality*** of Freshwater for drinking, for the most part, more than 50% or more (up to 75%) of the respondents identified seven (7) of the twelve (12) items as major factors that would negatively impact the quality of Freshwater for drinking. Written in rank order were; littering, lack of rainfall, deforestation, lack of water storage capacity, pit latrines, soak-away pits and industrial effluent discharge. In relation to what negatively affects the ***quantity*** of Freshwater for drinking, more than 50% or more (up to 85%) of the respondents identified 4 of the 12 items as major factors that would negatively impact the quantity of Freshwater for drinking. Written in rank order were; lack of rainfall, lack of water storage capacity, deforestation, and littering. Littering, lack of rainfall, pit latrines, industrial effluent discharge, fish farming, soak-away pits, use of pesticides by farmers and sewage treatment plants were said to affect the quality of Freshwater for drinking. On the other hand, deforestation, too many housing schemes and population increase affected the quantity of Freshwater for drinking.

Significantly fewer respondents in 2015 said that they had enough information on actions they personally could take to help protect the environment. There was an 18-percentage point decrease compared to 1998 in persons who said "yes" they had enough information. In 2015, if those who said "no" and "not sure" were combined it would show that some 57% of

respondents felt that they did not have enough information. This compared to 52% in 1991 and 35% in 1998.

In relation to knowledge about the environment, it was said that it has changed minimally for the better, and has retrogressed in some instances. It could be said that the populace is a little behind, based on the access to information. It would naturally follow that because of the preponderance of technological devices/apparatuses and the exposure to more information, our people would be more informed about these issues, but that's not the case. An extremely large ground needs to be covered to bring our population up to speed with important environmental issues.

Attitude to the Environment

General concern for the environment significantly increased in 2015 compared to 1998, while the level of unconcern for the environment decreased by 12 percentage points over 1998. Those who were concerned showed less marked decrease, in that the decrease was only by about 7 percentage points over 1998. The most significant result was the 22-percentage point increase among those who were quite extremely concerned.

Concerns for the environment ***over the past five years*** increased significantly in 2015 compared to 1998 (a 33 percentage point increase). The proportion of respondents who indicated that their concerns remained the same was notably less in 2015 compared to 1998(23% versus 54.4%). The positive attitudes in relation to respondents' concern for the environment, is a significant gain which should be encouraged, because, to change attitudes is not an easy task and must certainly be borne in mind in the design of any intervention.

Overall, significantly more individuals in 2015 felt that they could have some kind of effect on protecting the environment than individuals in 1998 did. This is another positive trend in relation to attitudes, and must be reinforced in any educational intervention.

Respondents expressed certainty that the environment was important to the quality of their lives. 58.4% indicated that they "strongly agreed" that the state of the environment was important to the quality of their lives, about 32% "agreed", and a small proportion (7.5%) were neutral. Only 2.6% "disagreed" with the statement. It can safely be concluded based on the data, that 90.4% of respondents agreed that the environment was important to the quality of their lives.

There was a general willingness to participate in the protection of the environment. To take part in community tree planting 83% said yes, willingness to join an organization dedicated to protecting the environment 79.1% indicated "yes", willingness to plant a seedling in the community 90% responded "yes", willingness to care for the young seedlings planted 92.7% responded "yes", and willingness to participate in recycling programmes 84.5% indicated "yes".

Many respondents felt sure that there was something they could do to help to protect the environment. About six out of every ten respondents (61.7%), felt that there was something they could do to help to protect the environment; however, a significantly large proportion, (32.4%), was unsure.

In 1998, about 56% of respondents expressed a willingness to change to a more environmentally friendly lifestyle, but in 2015, there was an increase to 67% (an 11-percentage point increase). Those who said "probably" (29.4% in 1998 vs. 26.3% in 2015), could be considered as "sitting on the fence'. This is a 3.1% difference in favour of the results of 2015.

Practices in the Environment

Significantly fewer respondents indicated that they would burn their household garbage in 2015 compared to 1998. This was a 25-percentage point decrease. This was also the same pattern for burying garbage (– a 32 percentage point decrease). There was a notable shift in those who said they would not burn, bury, throw in gully or open lot, and also, a large proportion in respect of 2015 (a 22 percentage point increase).

Although respondents, to a large extent engaged in positive practices in relation to the usual methods of disposing of garbage, there were some who were engaged in negative and possibly destructive practices. Forty-seven point three percent (47.3%) of respondents indicated that they did not separate and put out garbage to be collected by the truck, while 16.7% separated and put out their garbage to be collected by truck. On the other hand, 27.8% indicated burning, 6% indicated burying, and 1.2% each indicated throwing in gullies and other methods. It is recommended that the issue be studied further and peoples' cultural practices/real situations be better understood. People, without adequate resources for positive behaviour change will be at a disadvantage when it comes to exhibiting acceptable behaviour in these circumstances.

By the same token, in relation to **personal actions taken in the last year** to protect the environment, the responses were mixed, i.e. both negatives and positives came out. Among the positives were a good proportion who indicated planting trees (41.1%), try to use less electricity (64.4), and return glass bottles whenever possible (37.7%). Among the negatives was burning garbage (a reasonably large 22.7%). On the other hand, the response to, personal **actions taken within the last week** to help protect the environment were a bit different in proportion but were largely in the top 4. They were; try to use less electricity (60%), have planted trees (20%), return glass bottles whenever possible (17.9%) and burn garbage (14.6%). It has been noted and has been observed over time however, that persons, in many instances who burn garbage do so for hygiene and aesthetic purposes (and not necessarily to create problems), because there is no other alternative available, for example, that of a truck collecting garbage, so they engage in burning.

For the most part, respondents could not identify with any of the options given in respect of recent involvement or action to protect the environment (41.6% of the times). Those actions were; "I have joined or I am a member of an organization involved with the environment", "I have shared information about the environment on social media", "I have read an article/s to help me become more environmentally aware", "I have supported environmental actions with

money or time". A little more than one-fifth (22.6%) indicated that they 'had read an article/s to help them become more environmentally aware'. Small proportions indicated joining an organization that was involved with the environment (5.9%) or shared information about the environment on social media (7.7%). About 9% said they supported an organization involved with the environment.

Perception of NEPA

With regards to the Government Agency with major responsibility responsible for the environment in Jamaica, the perception of NEPA was generally positive, but negative to some degree. A little over fifty-two percent (52.4%) of respondents named NEPA as the responsible Government Agency; 58.7% had indicated that they knew, but 6.3% of that proportion had other answers; they gave other Agencies/Ministries of Government. Approximately seventy three percent (72.8%) of respondents also said that they had heard of NEPA prior to the day of the interview; 16.3% indicated "no", while 10.8% said that they could not remember.

The work done by NEPA was reasonably well understood by respondents. 68% of the time respondents identified 'protecting the environment' as work done by NEPA. The next most prevalent response was 'pollution prevention and control' (indicated 43.8% of the times). 39% of the time respondents said that NEPA's work was to "conduct public education/educate people about the environment'.

It is important to note that more than six of every ten respondents (65.8%) said "yes", they had seen or heard about NEPA and its work within the past year. About 18% said that they had not heard or seen anything and 16% could not remember such.

Those respondents who had heard or seen something about NEPA were asked to identify as many things from a list indicating what they would have heard or seen. Most of the substantial situations indicated in which respondents heard/saw NEPA were related to the print or electronic media (news items on TV (45.6% of the times); advertisement on TV/Radio (19.6%);

educational programmes on TV/Radio (16.9%); and public service announcements on TV/Radio (11%).

In relation to protecting the environment 52.7% of respondents felt that NEPA was doing a good job in this regard, and. 47% agreed that NEPA was doing a good job in educating the public about the Jamaican environment. Most respondents (60.8%) overall felt that NEPA could do more to help protect the environment.

On the other hand, 16% of respondents said “no” and 31.5% was unsure if NEPA was doing a good job. 23.1% said “no” and 29.9% were unsure if NEPA was doing a good job of educating the public about the environment 6.5% said “no”, and 32.7% was unsure as to whether NEPA could do more to help protect the environment.

NEPA’s Public Education Programmes and Activities

It should be noted that in relation to respondents’ awareness of the various events, for the most part they were aware of all events mentioned. More respondents were aware of the International Coastal Clean-up Day (52.3%) than any other event.

It should be pointed out that although more than 20% of the respondents were aware of four (4) ‘key ‘events; International Coastal Clean-up Day (52.3%), National Environmental Awareness Week (43.4%), World Wildlife Day (20.3%) and the Annual NEPA Display at Denbigh (21%); only 2-6% had ever participated in these events. Very low participation was indicated for these events overall (1.1% - 6.7%). It is incumbent on the PECCB to engage the population on important issues affecting the environment.

In respect of knowledge of the various media services available for educational purposes, most respondents were aware of Website (33.0%), Facebook (27.5%) and library (22.5% as media through which information is disseminated by NEPA. With respect to their use, the most prevalent media identified by respondents as being used were Website (13.5%), Facebook

(15.3%), You Tube (10.55), and to a lesser extent Twitter and Instagram (12% combined). The overall usage pattern indicated was very low at 2.5% -13.5%.

From the focus group findings, participants indicated learning very valuable lessons in relation to individuals involved, such as other persons, schools, communities, and Jamaica as a whole. Participants, as a result of the learning which had taken place, had improved their knowledge and skills greatly, and had changed their attitudes and behaviours in positive ways. In both discussions, participants expressed the idea of seeing the continuation of those projects or others of a similar nature. The programmes/projects that were centres of focus in the two (2) focus group discussions showed that interventions like those made a positive impact not only on those directly involved, but also on many others who were indirectly involved. Interventions like those were of a more lasting effect when carefully planned and implemented. Those sustained targeted interventions however, must be in any planning for positive changes in knowledge, attitudes, practices and behaviour of the people envisaged for such responses.

Recommendations

Knowledge of the Environment

1. In relation to the fact that there are a few grey areas as to the meaning of the environment, NEPA's definition of the environment should be a reinforcing factor and should be looked at in this situation.
2. More sustained focus should be placed on the importance of the varied aspects of the environment, as garbage disposal always came out as the most important aspect. For example, the fishing industry was seen as not necessarily that important.
3. In relation to respondents' relatively low knowledge of the role of auto emissions as major air pollutants, it is recommended that work be done with;
    a. Transport-related entities, like the Transport Authority
    b. The Police, especially the Traffic Division
    c. Other important Government Entities (especially the Transport Divisions).
    d. Community/other organizations

4. The role of the main water Agency and related Government Entities/Ministries should be incorporated into educational programmes and activities to improve knowledge on the importance of the quality of our Freshwater for drinking.
5. In relation to respondents' confessions that they had inadequate information on actions they could take to help to protect the environment, one recommendation here is to provide more avenues for the population to be recipients of relevant and accurate information, bearing the various age groups in mind.
6. Generally, those with limited or no knowledge of the environment and its related effects/concerns must be targeted, with the aim of improving their knowledge. All aspects of the media could be used to reach them; there is a multiplicity of other sources and strategies that should not be overlooked.

Attitude to the Environment

7. The positive attitudes in relation to respondents' concerns for the environment and their belief that they could have some kind of effect on the environment, is a significant gain which should be ***encouraged and continued***. To change attitudes is not an easy task and must certainly be borne in mind in the design of any intervention. Carefully and well-designed interventions must be looked at.
8. One way to instil a sense of pride in citizens for the environment is to allow them to participate in its development & protection. For example, one approach could be to allow them to engage in tree planting/tree maintaining exercises; however, or this to be effective, it must be done in a sustained & continuous manner; not ad hoc. This could be done in conjunction with agricultural entities (Governmental & Non-Governmental), in the country.
9. A concerted effort must be made to 'move', (as the educational process can be considered as a "mental movement") that segment of the population which is unsure as to what to do to help to protect the environment, as well as those who are "sitting on the fence". More targeted efforts must be made to change that level of indecision

to a more positive outcome. Expert analysis on the issue should be employed to make the desired results positive.

Practices in the Environment

10. People, without adequate resources in relation to garbage disposal, will find some way to get rid of it. Unacceptable means are therefore usually employed. This underscores the need for serious consideration. There is the opportunity for a multi-sectoral approach to solving this enormous problem (the NSWMA, NEPA, the related Ministry/ies, other related organizations, and Communities). Positive behavioural change can be a reality with the dedicated and sustained efforts of those partners.
11. The implementation of recycling projects and programmes would encourage citizens to recycle plastic. It should be borne in mind that people will engage in positive behaviours if they see the benefits to them.
12. It is recommended that NEPA in its quest encourage communities around the island to participate in positive environmental actions, and that community organizations be targeted in more concerted ways. One useful strategy could be to allow communities to participate in targeted environmental projects. Another could be to form Environmental Clubs or streamline environmental programmes/projects activities through existing community organizations. This latter approach augurs well for continuity.

A similar approach was suggested in Peter Espeut's 1998 study recommendations; "*already existing organizations – e.g. church organizations, citizens' associations and youth clubs should be encouraged to adopt an environmental agenda. Establishing this network of organizations with an environmental focus should be the work of both the NRCA (**now NEPA**) and the more established ENGOs*."

Perception of NEPA

13. It may be a useful idea to consider more localized NEPA branches in selected parish capitals or selected towns to help spread the impact of NEPA on the island. On the

other hand, it may be more useful and practical to upgrade the resources (man, money, materials & equipment) of existing similar entities towards the same end.

Generally, it is important to note that in effecting changes in relation to knowledge, attitudes, practices and behaviour, the programmes and projects, approaches and strategies used must be looked at from a holistic perspective, and must be comprehensive in nature.

NEPA's Public Education Programmes and Activities

14. The development and implementation of sustained targeted educational programmes utilizing those commemorative events as part of the mix is very important. Commemorative events however, that are a part of a larger continuous/ sustained programme will have greater effects on citizens. Focus on designing programmes and interventions in order to increase usage.
15. In relation to stem the low usage pattern of NEPA's media services, creative ways have to be found to allow persons to utilize those services, mentioned. A strategy such as special promotions is useful. Additionally, a focus could be designed and disseminated at the Annual NEPA's Denbigh display, as well as during other commemorative events. Focus should be on designing programmes and interventions with a view to increasing the usage of NEPA's media services. The twinning of promotions with other entities/ organizations could be a worthwhile venture.
16. It will be useful to target select groups and organizations with selected projects, within communities, in order to create greater focus on environmental issues. In a similar way, the focus on educational institutions will prove to be very beneficial. This will certainly impact, knowledge, attitudes, practices and eventually behaviour, positively.
17. Finally, it is strongly recommended that another study be designed in order to provide more insights into the educational approaches implemented by the PECCB, and the impact of those approaches on particular segments of the population. That study should be dedicated solely to the PECCB's programmes/projects and activities.

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Appendix 1

Questionnaire no: _____

1. Date of questionnaire administration:
/dd /mnth. /yr.
2. Parish _____
3. Town/com. in which questionnaire is done;
[ ] KMA [ ] OUC/OT [ ] Rural Area (RA)

NEPA National KAPB Study Questionnaire – 2015/2016

Good day. I am ----------. **The National Environment and Planning Agency – NEPA,** is seeking your participation in an island wide survey to ascertain knowledge, attitudes, practices & behaviour (KAPB) about the environment and how people perceive the organization itself - NEPA. This information is needed to enable the organization to plan programmes to benefit the country. The information you share will be kept confidential and will only be used for planning purposes, and the development of educational programmes and activities. Thanks for your participation.

Socio-demographic Information – Section 1

1. Are you [ ] Male [ ] Female?

2. Indicate the age group to which you belong;
   a. [ ] 18 – 24 b. [ ] 25 – 34 c. [ ] 35 – 44 d. [ ] 45 – 54 e. [ ] 55 – 64
   f. [ ] 65 and over

3. Do you have any children? [ ] Yes [ ] No

4. If "yes" to question 3, how many children do you have?
   _____

5. Are you presently employed? [ ] Yes [ ] No

6. What kind of work do you do for a living? (***If more than one name the major one***)

   _____

7. What was the last school you completed?

   a. [ ] Basic b. [ ] Primary/All Age c. [ ] Secondary/High/Technical d. [ ] Community College

   e. [ ] Tertiary (University, College etc.) f. [ ] Other , specify

      _____

   g. [ ] Didn't attend any school

8. What is the highest examination you have passed:_____ [ ] Didn't pass any

9. What is your marital status?

   a. [ ] Single/not living with a partner b. [ ] Married c. [ ] Separated d. [ ] Divorced

   e. [ ] Widowed f. [ ] Common law/living with partner.

Knowledge of the Environment – Section 2

10. What do you understand by the term, "Environment"?

    _____

    _____ [ ] Don't know

11. At present, what do you personally think is the **major issue** affecting Jamaica's environment? **(One answer)**

    _____

12. Which aspect of Jamaica's environment do you think is **most** threatened? **(Only one answer)**

_____

13. a. How would you rate the negative effect of each of the following on Jamaica's environment? Answer on a scale from 1 to 10, with 1 having no effect and 10 having tremendous effect. Kindly indicate **DK (Don't Know)** if you are unfamiliar with the item.

b. Which **<u>one</u>** on the table below do you think has the greatest negative impact on Jamaica's environment? (**Place a tick in the extreme right column to indicate the answer. Please read aloud all, again.)**

Item	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**DK**	**Greatest negative impact**
1. Household garbage												
2. Automobile exhaust												
3. Sewage pollution												
4. The Forestry Industry												
5. The Fishing Industry												
6. The Mining Industry												
7. The individual resident												
8. Toxic wastes												
9. Manufacturing Plants/ factories												
10. Agriculture's use of pesticides & herbicides												

14. Which of the following contribute to A**ir Pollution**:

a. Automobile Emissions	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
b. The Fishing Industry	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
c. Burning refuse/rubbish	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
d. Industrial Plants	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
e. Citrus Farms	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
f. Power Generating Plants	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
g. Aerial Crop Dusting (spraying)	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
h. Quarrying	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
i. Sewage Treatment Plants	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
j. Sugar estates (cane burning)	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK

15. Which of the following are pollutants in M**otor Vehicle Exhaust**:

a. Carbon Dioxide	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
b. Carbon Monoxide	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
c. Lead	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
d. Oxygen	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
e. Arsenic	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
f. Small particles	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
g. Tin	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
h. Sulphur Oxides	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
i. Nitrogen Oxides	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
j. Iron Oxides	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK

16. Which of the following do you think negatively affect the **quality** of Freshwater for drinking?

a. Littering	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
b. Lack of rainfall	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
c. Deforestation	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK

d. Pit latrines	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
e. Too many housing schemes	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
f. Industrial effluent discharge	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
g. Fish farming	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
h. Soak away pits	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
i. Use of pesticides by farmers	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
j. Sewage Treatment plants	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
k. Population increase	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
l. Lack of water storage capacity	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK

17. Which of the following do you think negatively affect the **quantity** of Freshwater for drinking?

a. Littering	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
b. Lack of rainfall	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
c. Deforestation	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
d. Pit latrines	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
e. Too many housing schemes	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
f. Industrial effluent discharge	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
g. Fish farming	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK
h. Soak away pits	1. [ ] Major	2. [ ] Minor	3. [ ] Not at all	4. [ ] DK

i. Use of pesticides by farmers 1. [ ] Major 2. [ ] Minor 3. [ ] Not at all 4. [ ] DK

j. Sewage Treatment Plants 1. [ ] Major 2. [ ] Minor 3. [ ] Not at all 4. [ ] DK

k. Population increase 1. [ ] Major 2. [ ] Minor 3. [ ] Not at all 4. [ ] DK

l. Lack of water storage capacity 1. [ ] Major 2. [ ] Minor 3. [ ] Not at all 4. [ ] DK

18. Would you say that you have enough information on actions you personally could take to help protect the environment? [ ] Yes [ ] No [ ] Not sure

19. If "no" to question 18, what type of information would you like to obtain? (**Probe**)

_____

Attitude to the Environment – Section3

20. Generally speaking, which of the following statements best describes your feelings about the environment? **(Read all options for them to choose only one).**
    1. [ ] I have **no concerns** about the environment
    2. [ ] I have **few concerns** about the environment
    3. [ ] I have **some concerns** about the environment
    4. [ ] I am **quite concerned** about the environment
    5. [ ] I am **extremely concerned** about the environment

21. Would you say that over the last five years your concerns for the environment have … (**Read all options**)
    1. [ ] increased significantly 2. [ ] increased somewhat/a little 3. [ ] remained the same
    4. [ ] decreased somewhat/a little 5. [ ] decreased significantly

22. How much effect do you think individuals such as yourself can have on protecting the environment? (**Read all options**)

1. [ ] Can have an **extremely large** effect 2. [ ] Can have **quite a large** effect
2. [ ] Can have **some** effect 4. [ ] Can have **very little** effect 5. [ ] Can have **no** effect

23. With respect to the following statement, say whether you agree, strongly agree, are neutral, disagree, or strongly disagree; ***"The state of the environment is important to the quality of my life". (*****Read all options*****)**

1. [ ] Strongly Agree 2. [ ] Agree 3. [ ] Neutral 4. [ ] Disagree 5. [ ] Strongly disagree

24. a. Would you be willing to pay more money for environmentally friendly/less harmful products?

[ ] Yes [ ] No [ ] Not sure

b. Would you be willing to take part in a community tree planting exercise or programme?

[ ] Yes [ ] No [ ] Not sure

c. Would you be willing to join an organization dedicated to the protection of the environment?

[ ] Yes [ ] No [ ] Not sure

25. If land was available to you, would you be willing to plant a seedling in your community? [ ] Yes [ ] No [ ] Not sure

26. If "yes" to question 25, would you be willing to care for that young seedling that you have planted?

[ ] Yes [ ] No [ ] Not sure

27. If you were living in a community which launched a garbage-recycling programme, would you be willing to take part even if participation was not compulsory? [ ] Yes [ ] No [ ] Not sure

28. Do you feel that you would change your lifestyle in any way in the future to help protect the environment?
[ ] Yes [ ] No [ ] Probably [ ] Don't know

29. Do you think there is anything you can do to help protect the environment?
[ ] Yes [ ] No [ ] Not sure

30. If "yes" to question 29, what can you do to help protect the environment
_____

Practices in the Environment – Section 4

31. In communities where household garbage is not collected, which of the following methods would be environmentally appropriate for residents to dispose of their household garbage? **Choose all that apply!**
1. [ ] Burning 2. [ ] Burying 3. [ ] Throw in gully 4. [ ] Throw in open lot
2. [ ] None of the above **(Do not prompt this)**

32. What do you usually do with your household garbage? **Record all answers** (**Don't prompt**)
1. [ ] Burn 2. [ ] Bury 3. [ ] Throw into nearby gully 4. [ ] Separate and put up to be collected by truck 5. [ ] Don't separate but, put up to be collected by truck
6. [ ] Other (specify) _____

33. Which of the following actions have you personally taken in the last year in order to protect the environment? **(Choose all that apply)**

    1. [ ] I have planted trees
    2. [ ] I have spread garlic outside in the yard
    3. [ ] I use biodegradable products whenever possible (products that decompose naturally)
    4. [ ] I buy phosphate-free detergent
    5. [ ] I return glass bottles whenever possible
    6. [ ] I try to use less electricity
    7. [ ] I use fewer chemicals in the garden such as insecticides and herbicides
    8. [ ] I do not use aerosols containing CFCs
    9. [ ] I do not buy certain products because of packaging concerns
    10. [ ] I burn my garbage
    11. [ ] I created/maintained a compost heap
    12. [ ] I took steps to prevent soil erosion
    13. [ ] I do not buy lobster in the closed season
    14. [ ] Other (specify) _____

34. In relation to protecting the environment, which of the following have you been involved with or done recently: **(Choose all that apply)**

    1. [ ] I have joined or I am a member of an organization involved with the environment. **Which organization? _____**
    2. [ ] I have shared information about the environment on social media. **Which social media?** _____
    3. [ ] I have read an article/s to help me become more environmentally aware. **What media? _____**
    4. [ ] I have supported environmental actions with money or time. **How much per year? $_____ Time_____**

5. [ ] None of the above

35. Can you name anything that you did within the **past week** that you think could be considered **helpfu**l to the Jamaican environment? **(Choose all that apply)**
    1. [ ] I have planted trees
    2. [ ] I have spread garlic outside in the yard
    3. [ ] I use biodegradable products whenever possible (**products that decompose naturally**)
    4. [ ] I buy phosphate-free detergent
    5. [ ] I return glass bottles whenever possible
    6. [ ] I try to use less electricity
    7. [ ] I use fewer chemicals in the garden such as insecticides and herbicides
    8. [ ] I do not use aerosols containing CFCs
    9. [ ] I do not buy certain products because of packaging concerns
    10. [ ] I burn my garbage
    11. [ ] I created/maintained a compost heap
    12. [ ] I took steps to prevent soil erosion
    13. [ ] I do not buy lobster in the closed season
    14. [ ] Other (specify) _____
36. Can you name anything that you did within the **past week** that you think could be considered **dangerous** to the Jamaican environment;**(Choose all that apply)**
    1. [ ] Burn my garbage
    2. [ ] Burn cuttings/grass from the yard
    3. [ ] Burn plastics – e.g. Plastic bags, plastic bottles.
    4. [ ] Cut down trees unnecessarily
    5. [ ] Cut down trees for burning coal
    6. [ ] Do not necessarily use biodegradable products (**products that decompose naturally**)
    7. [ ] Dump garbage in gullies

8. [ ] Throw garbage on the streets/litter the streets
9. [ ] Use a lot of chemicals in the home
10. [ ] Use a lot of chemicals in the garden
11. [ ] Other (Specify)

_____

Perception of NEPA – Section 5

37. Can you name the government agency which has the major responsibility for the environment in Jamaica? [ ] Yes [ ] No ***(If "no" go to question 39)***
38. If "**yes**" to question 37, please name the agency.

_____

39. Apart from today, have you ever heard of the National Environment & Planning Agency - NEPA?

[ ] Yes [ ] No [ ] Can't remember (***If "No" or "Can't remember", go to question 47***)

40. If **"yes**" to question 39, which of the following work is done by NEPA? (**Read out all responses. More than one can be recorded)**

1. [ ] Protecting the environment 2. [ ] Prosecuting people who destroy the environment
3. [ ] Natural resources management 4. [ ] Land use & spatial planning 5. [ ] Pollution prevention & control 6. [ ] Conduct public education/educate people about the environment
7. [ ] Other (Specify)

_____

8. [ ] Don't know what NEPA does **(If don't know move to question 47**)

41. Within the **past year** have you ever heard or seen anything about NEPA and its work?

[ ] Yes [ ] No [ ] Can't remember

42. If “yes” to **Q 41**, what have you heard or seen about NEPA and its work in the **past year**? (**Choose all that apply)**

1. [ ] News item on TV/Radio 2. [ ] Advertisement in Newspaper 3. [ ] Advertisement on TV/Radio
4. [ ] Educational programme on TV/Radio 5. [ ] Discussion programme on TV/Radio
6. [ ] Newspaper article 7. [ ] Letter to the editor in the newspaper 8. [ ] Posting/article on the internet 9. [ ] Statement from NEPA on TV/Radio 10. [ ] Public service announcement on TV/Radio 11. [ ] Heard discussions about NEPA in the community 12. [ ] Other (specify)

_____

43. Do you think NEPA is doing a good job in protecting the environment in Jamaica?
[ ] Yes [ ] No [ ] Not sure

44. Do you think NEPA is doing a good job in educating/informing the Jamaican public about the environment?
[ ] Yes [ ] No [ ] Not sure

45. Do you think NEPA can do more to help protect the environment? [ ] Yes [ ] No [ ] Not sure

46. If “yes” to question 45, what suggestion/s do you have as to what more can NEPA do to help protect the environment?

_____

NEPA's Public Education Programmes and Activities – Section 6

47. Are you aware of (**heard of, or know about**) any of the following events, and if so have you ever participated in any of them? **(Read out each one aloud).**

	Are you aware of event?		**Ever participated in event?**	
	Yes	**No**	**Yes**	**No**
1. World Wildlife Day				
2. National Environmental Awareness Week				
3. International Coastal Clean-up Day				
4. International Ozone Day				
5. World Town Planning Day				
6. World Wetlands Day				
7. World Water Day				
8. International Day for Biodiversity				
9. Annual NEPA Display at Denbigh				

48. If you have ever participated in any of those events mentioned above could you select any **one** and say how it has benefitted you personally; **(Read aloud from list if participated in any event).**_____

49. Are you aware of (**heard of or know about**) any of the following media through which NEPA offers educational and other services to the public; and if so have you ever used any of those services? **(Read out all aloud).**

Item	Are you aware of services?		Ever used any of the services?	
	Yes	No	Yes	No
1. Library – Document centre				
2. Website				
3. Public education department				
4. Face book				
5. LinkedIn				
6. Twitter				
7. Instagram				
8. YouTube				
9. Flickr				

Interviewer: _____

Checked by: _____

Appendix 2

Focus Group Discussion Guide – Mico Practicing Primary & Junior High School

November 11, 2015

A. Introduction

1. Introduce facilitator & assistant
2. Introduction of participants
3. Purpose of discussion
4. Ground Rules -
5. Encourage participation, other aspects

B. Warm –up – Informal discussion/ icebreaker, to get the group relaxed. Focus on some current event/s – Sports etc.

C. Areas of Focus for Discussion

1. Lessons learnt from; **(Probe each item)**
    a. Recycling water and organic matter,
    b. Field trip to Port Royal Palisadoes Protected Area,

c. Growing vegetable garden,

d. Process of composting.

2. How useful do you think the project was…? **(Probe each item)**

   a. to you, (How has it helped you?)

   b. to the club (How has it helped the club?)

   c. to the school? (How has it helped the school?)

3. What is it that you now know that you didn't know before? **Probe re field trip, recycling, the garden exercise, process of composting.**
4. How has it helped you, being a part of the environmental programme? **Probe**
5. What are you now doing differently? **Probe**
6. Generally, how has it helped the club of which you are a part? **Probe**
7. How has it helped the school? **Probe**
8.

D. Summary & Conclusion

Appendix 3

Focus Group Discussion Guide – Portland Drivers River Watershed Project

December 10, 2015

E. Introduction

1. Introduce facilitator & assistant

2. Introduction of participants

3. Purpose of discussion

4. Ground Rules -

5. Encourage participation, other aspects

F. Warm –up – Informal discussion/ icebreaker, to get the group relaxed. Focus on some current event/s – Sports etc.

G. Areas of Focus for Discussion

1. Lessons learnt from; **(Probe each item)**

   e. Working on the committee
   f. With NEPA
   g. The Community/ties
   h. Various groups

2. How useful do you think the project was…? **(Probe each item)**

   a. to you,
   b. the parish & community/ties
   c. participants

3. How useful do you think each of the following was to the participants...?

   c. The competitions – essay, poster, debate;
   d. Community outreach meetings
   e. Programme on local cable stations
   f. Expos (with sports component)
   g. International days
   h. Summer Camp
   g. Fliers/Brochures

4. What is it that you/the communities now know that you didn't know before?

5. How has it helped you, being a part of this watershed project? **Probe**

6. What are you/the people now doing differently? **Probe**

7. Generally, how has it helped the parish or community of which you are a part? **Probe**

H. Summary & Conclusion

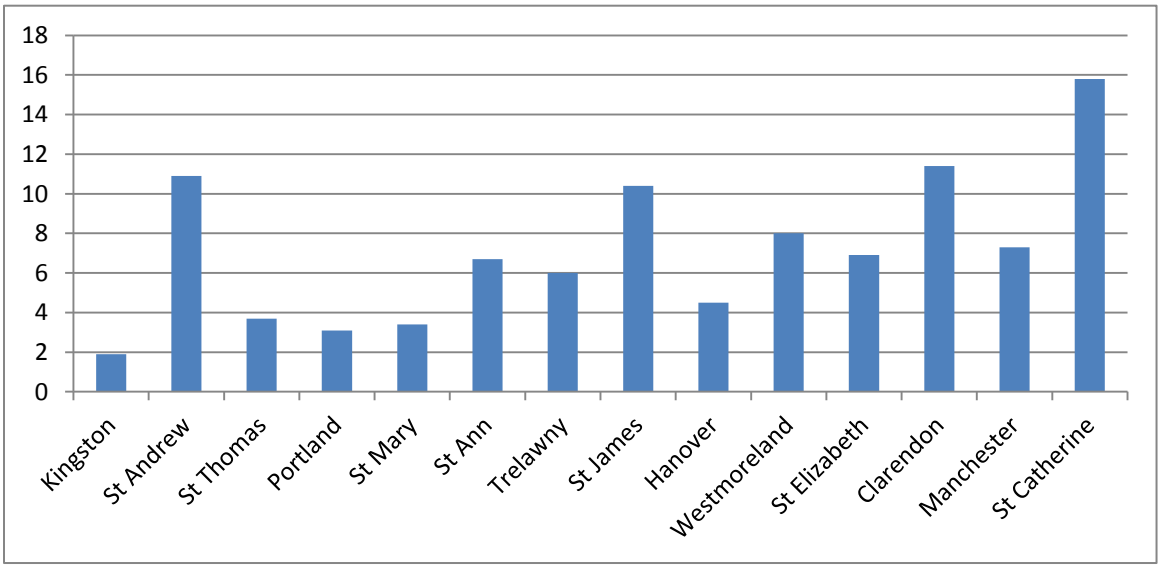
Appendix 4

Table A1: Distribution of Respondents by Parish and Location (Sampling Domains)

	KMA	*Other Towns*	*Rural Areas*	*Total*
Kingston	*119*	*-*	*-*	*192*
St Andrew	*1110*	*-*	*-*	*1110*
St Thomas	*-*	*77*	*301*	*378*
Portland	*-*	*57*	*256*	*313*
St Mary	*-*	*52*	*289*	*341*
St Ann	*-*	*379*	*409*	*688*
Trelawny	*-*	*108*	*506*	*614*
St James	*-*	*529*	*532*	*1061*
Hanover	*-*	*71*	*389*	*460*
Westmoreland	*-*	*336*	*474*	*810*
St Elizabeth	*-*	*141*	*564*	*705*
Clarendon	*-*	*425*	*736*	*1161*
Manchester	*-*	*175*	*567*	*742*
St Catherine	*-*	*1266*	*344*	*1610*
Total	*1302 (12.8%)*	*3516 (34.5%)*	*5367 (52.7%)*	*10185*

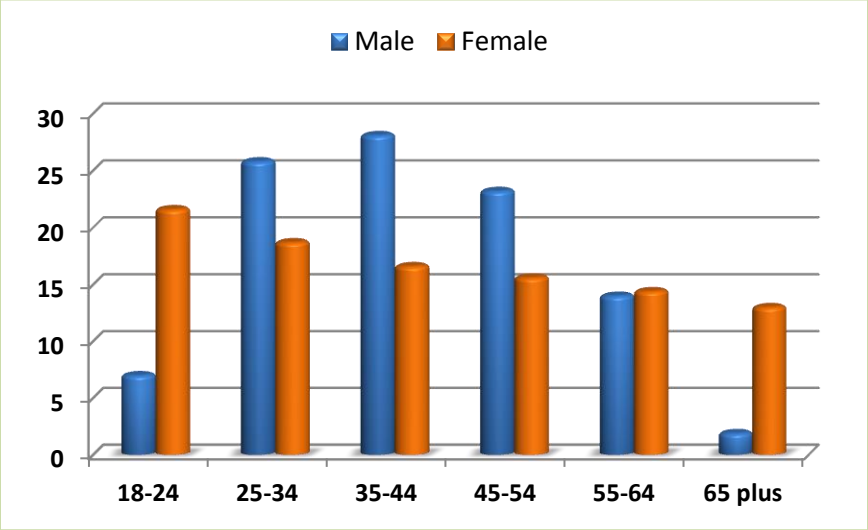
Appendix 5

Figure A1: Percentage Distribution of Responses by Parishes



Appendix 6

Figure A2: Employment Responses by Age Grouping – Related to questions 2 & 5



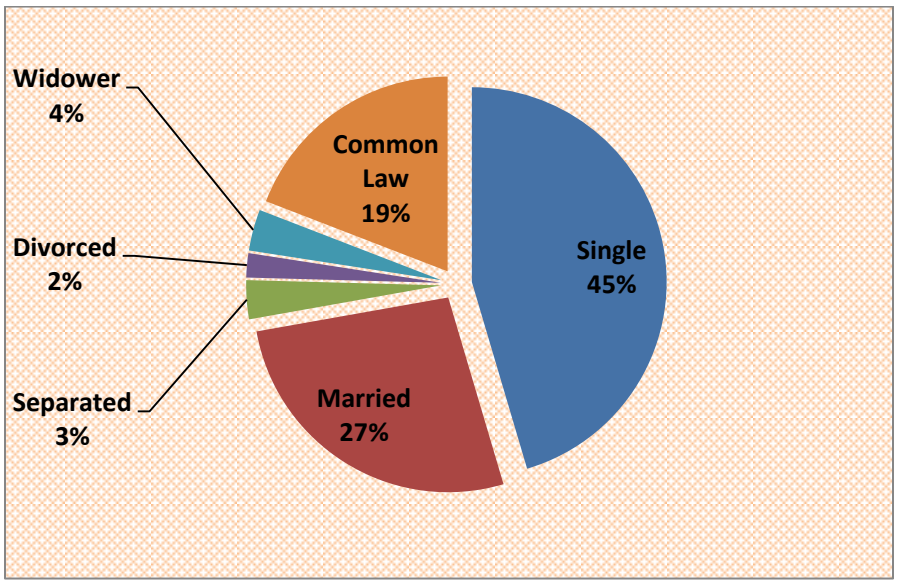
Appendix 7

Table A2: Last Level of Schooling Completed by Gender – Question 7

	Overall	***Male***	***Female***
Basic	*51(0.5)*	*13(0.3)*	*37(0.6)*
Primary/All Age	*2637(25.9)*	*1271(30.5)*	*1323(22.6)*
Secondary/High/Technical	*4590(45.1)*	*1821(43.7)*	*2724(46.5)*
Community College	*772(7.6)*	*272(6.5)*	*500(8.5)*
Tertiary (university, College etc.)	*1489(14.6)*	*568(13.6)*	*919(15.7)*
Other	*562(5.5)*	*214(5.1)*	*342(5.8)*
Didn't attend any school	*29(0.3)*	*214(0.3)*	*18(0.3)*

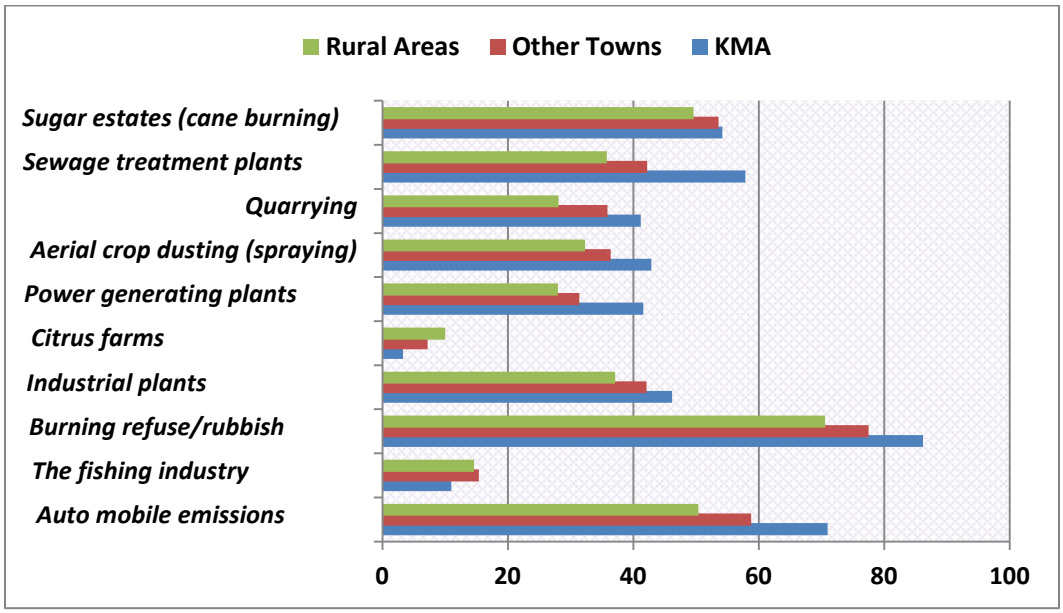
Appendix 8

Figure A3: Percentage Distribution of Responses by Union Status – Question 9



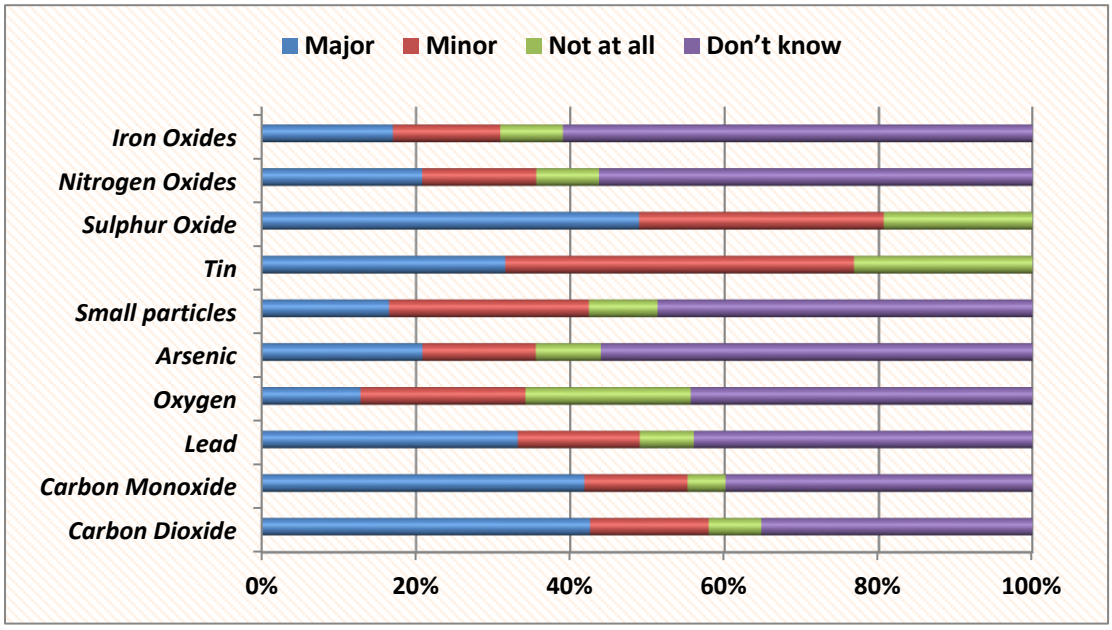
Appendix 9

Figure A4: Percentage of Major Contributors to Air Pollution by Location – Question 14



Appendix 10

Figure A5: Pollutants in Motor Vehicle Exhaust – Question 15



Appendix 11

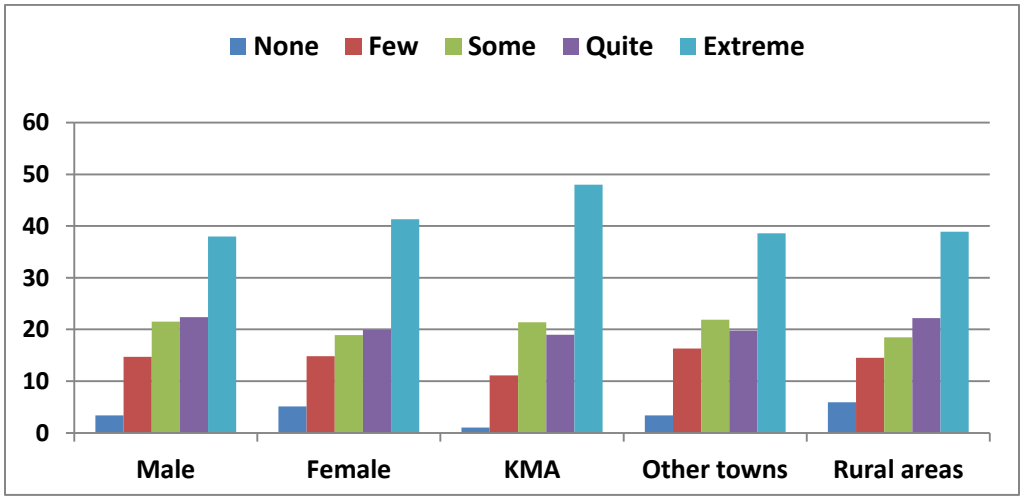
Table A3: Percentage Response: What Negatively Affects the Quality and Quantity of Freshwater for Drinking? – Questions 16 & 17

Item	*Percentage Responses*					
	Major		*Minor*		*Not at All*	
	Quality	*Quantity*	*Quality*	*Quantity*	*Quality*	*Quantity*
Littering	*74.6*	*55.5*	*13.3*	*22.3*	*8.4*	*16.1*
Lack of rainfall	*66.9*	*84.9*	*22.4*	*9.7*	*6.6*	*2.8*
Deforestation	*54.2*	*59.8*	*23.3*	*22.2*	*12.8*	*10.4*
Pit latrines	*53.6*	*35.0*	*24.6*	*30.6*	*13.6*	*23.3*

Too many housing schemes	*28.7*	*39.6*	*32.8*	*29.6*	*28.5*	*21.3*
Industrial effluent discharge	*49.5*	*32.1*	*19.5*	*28.0*	*11.6*	*19.2*
Fish farming	*14.9*	*14.7*	*34.2*	*36.0*	*31.9*	*29.5*
Soak away pits	*50.0*	*33.5*	*24.8*	*29.1*	*12.9*	*23.0*
Use of pesticides by farmers	*43.0*	*25.6*	*31.2*	*34.9*	*14.5*	*26.5*
Sewage treatment plants	*47.2*	*32.0*	*24.7*	*28.1*	*14.9*	*25.5*
Population increase	*36.9*	*48.0*	*27.9*	*25.0*	*23.8*	*17.7*
Lack of water storage capacity	*54.0*	*67.4*	*22.5*	*15.2*	*13.5*	*8.7*

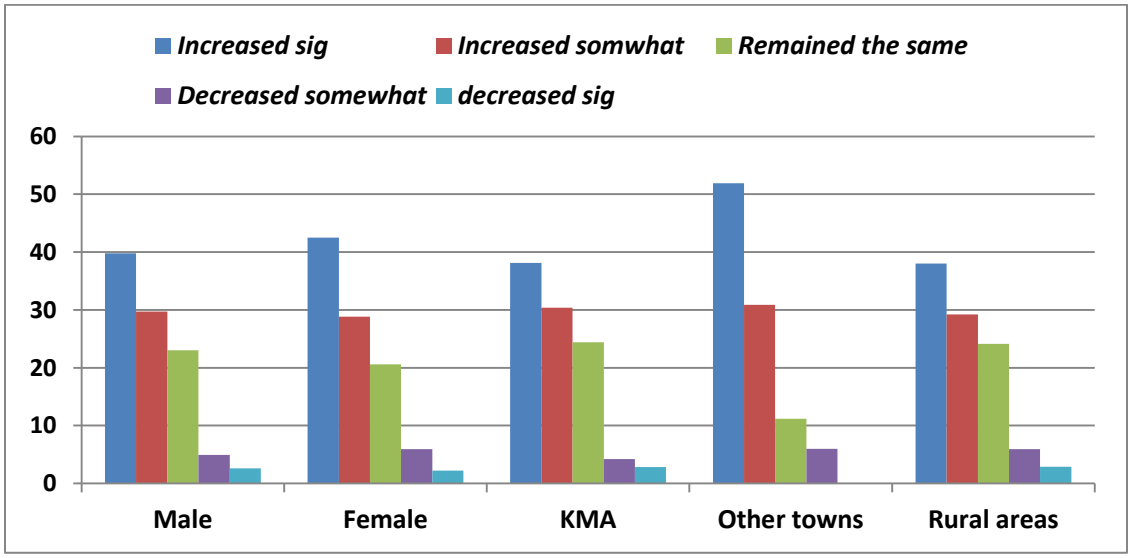
Appendix 12

Figure A6: Concerns about the Environment by Gender and Location – Question 20



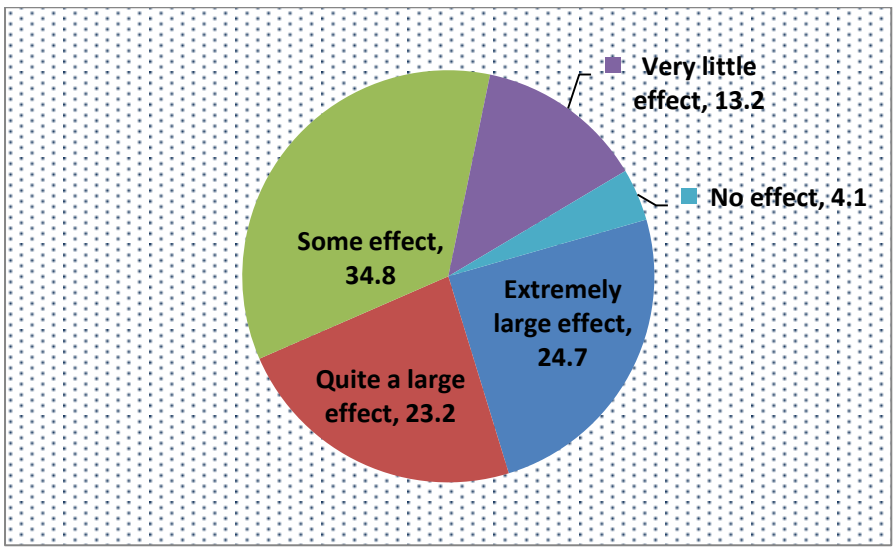
Appendix 13

Figure A7: Concerns for the Environment over the Past Five Years – Question 13



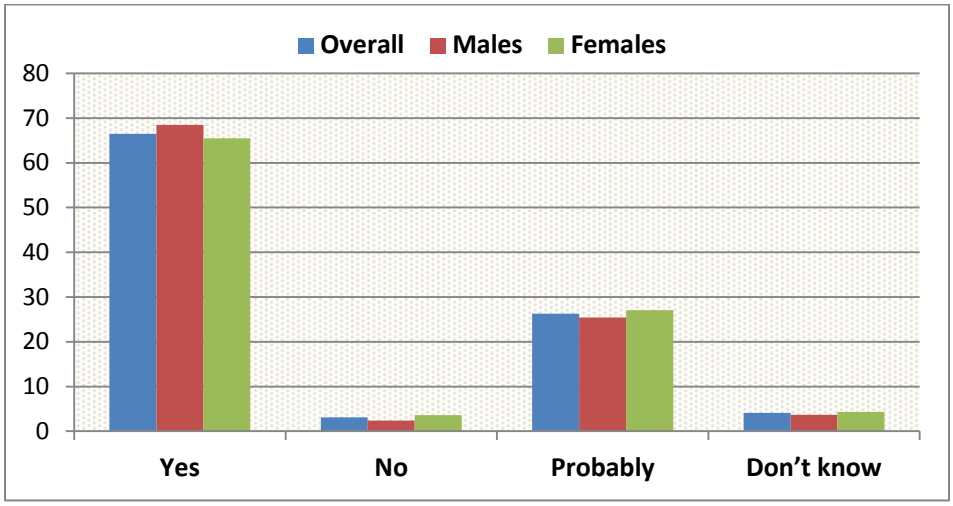
Appendix 14

Figure A8: Individual's Effect on Protecting the Environment – Question 22



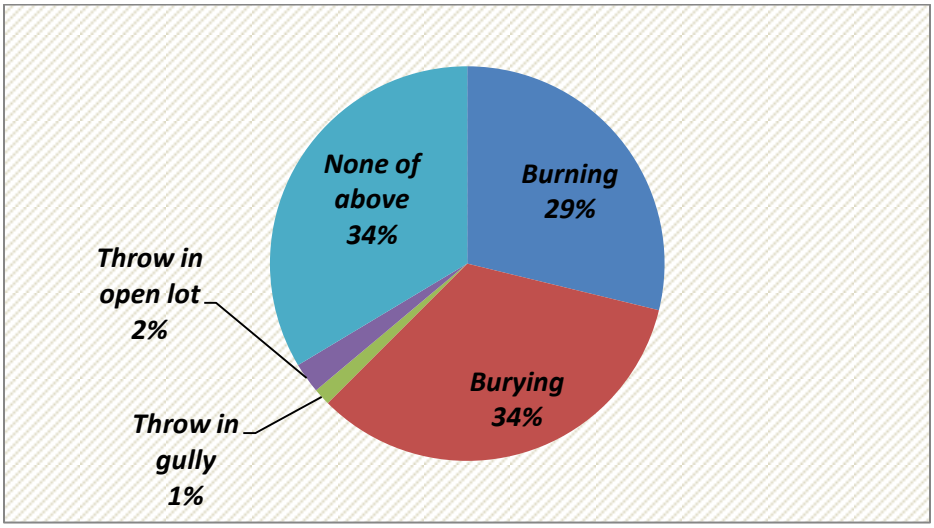
Appendix 15

Figure A9: Change Lifestyle to Help Protect the Environment – Question 28



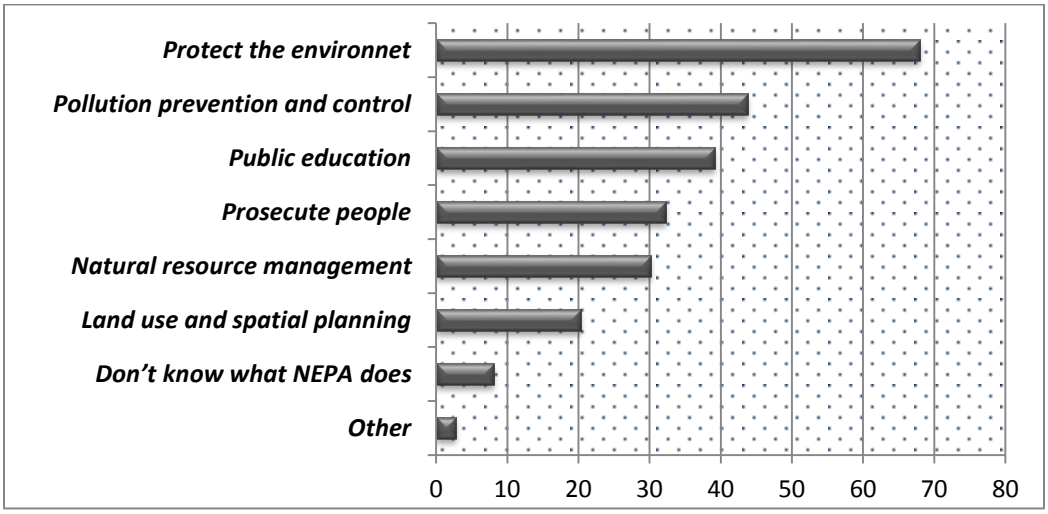
Appendix 16

Figure A10: Environmentally Appropriate Methods of Disposing of Household Garbage – Question 31



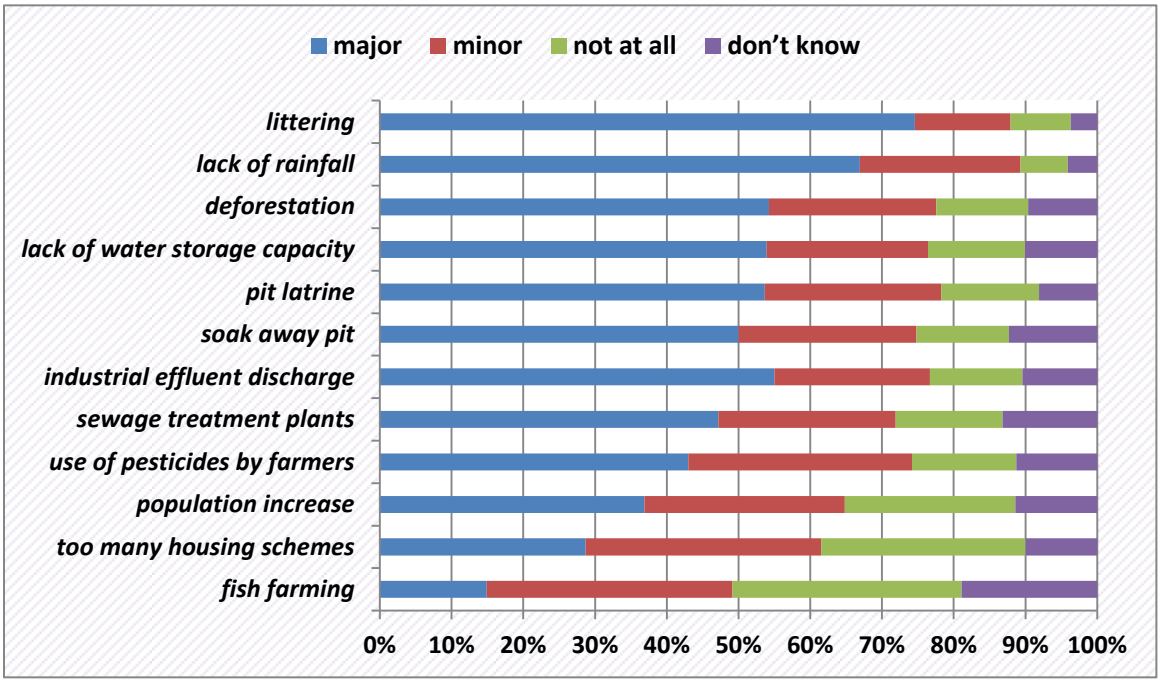
Appendix 17

Figure A11: Work Done by NEPA – Question 42



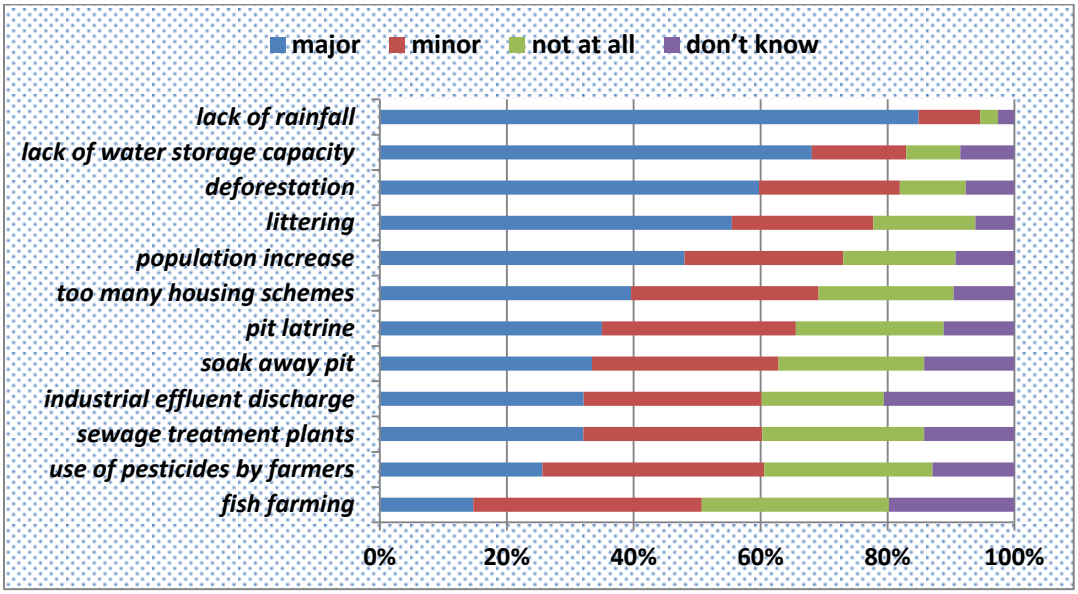
Appendix 18

Figure A12: Factors Negatively Affecting the Quality of Freshwater for Drinking – Question 16



Appendix 19

Figure A13: Factors Negatively Affecting the Quantity of Freshwater for Drinking – Question 17



Appendix 20: Table A4

Responses to question – "What do you understand by the term Environment?" – Question 10

	Frequency	Percent
A lot of flies	8	.1
Activity around us	8	.1
Air	47	.5
Air & land	24	.2
Air around	10	.1
Air breathe	11	.1
Air pollution	6	.1
Air, trees, cleanliness, health	14	.1
Area	86	.8
Around you	60	.6
Atmosphere	77	.8
Bad mind	20	.2
Bad people	9	.1
Burning	10	.1

Care of community	15	.1
Clean	28	.3
Clean area	15	.1
Clean community	15	.1
Clean drains	18	.2
Clean place	45	.4
Clean surrounding	15	.1
Clean up	53	.5
Cleaning	43	.4
Cleaning up	18	.2
Cleanliness	83	.8
Cleanliness of place	13	.1
Climate	60	.6
Climate change	18	.2
Community	959	9.4
Condition of area	23	.2
Crime	26	.3
Different people	18	.2
Dirty water; mosquitoes	6	.1
Disposal of garbage	17	.2
Do not know	1027	10.1
Dump waste/toxic	14	.1
Dwelling	95	.9
Earth	40	.4
Environment	73	.7
Everything around us	242	2.4
Everything you do	14	.1
Farming	8	.1
Forestry	12	.1
Garbage	6	.1
Garbage disposal	15	.1
Good	10	.1
Group of people	7	.1
Group of people living together	14	.1
Habitat	64	.6
Health	85	.8
Home	25	.2
How you treat certain things	14	.1
Important to us	8	.1
Interaction with nature	6	.1
Jamaica	28	.3
Keep place clean	18	.2

Keep surrounding clean	216	2.1
Lack of rainfall	8	.1
Land	51	.5
Land development	7	.1
Living area	8	.1
Living things	24	.2
More development	8	.1
More drains	8	.1
Mosquito	58	.6
Nature	5	.1
Natural places	7	.1
Nature	61	.6
Neighbourhood	18	.2
Non-employment	7	.1
Nothing	73	.7
Our country	11	.1
Outdoors	15	.1
People	54	.5
Place	70	.7
Place live	11	.1
Place of living	10	.1
Place to cleaned	7	.1
Pollution	8	.1
Poor	11	.1
Raining	8	.1
Road	8	.1
Safety	10	.1
Sanitary place	7	.1
Space	11	.1
Specific area	10	.1
State of living	5	.1
Stealing around	18	.2
Surroundings	5443	53.4
Sustain life	8	.1
The country	10	.1
Things around	8	.1
Trees	25	.2
Unemployment	8	.1
What is happening around you	6	.1
Where you live	17	.2
World	56	.5
Total	10185	100.0

Appendix 21

Table A5: Responses to question – "Major issues affecting Jamaica's Environment?" - Question11.

	Frequency	Percent
Bad Living	9	.1
Bad Mind	5	.0
Bad Roads	19	.2
Bills	7	.1
Blocked Drains	4	.0
Burning	137	1.4
Car Emission	3	.0
Citizens	21	.2
Cleaning	18	.2
Cleaning Up	18	.2
Climate	7	.1
Climate Change	9	.1
Coal Burning	11	.1
Coastline	7	.1
Community	9	.1
Compliance	11	.1
Crime	1351	13.3
Crocodile	8	.1
Culture	6	.1
Deforestation	214	2.1
Dirtiness	7	.1
Diseases	18	.2
Disposal Of Garbage	9	.1
Do Not Know	644	6.3
Drains	42	.4
Drought	76	.7
Dumping	49	.5
Dust	19	.2
Education	38	.4
Everything	15	.2
Everything Bad	8	.1
Exhaust	9	.1
Farming	29	.3
Fire	21	.2

Flooding	18	.2
Foot Hand And Mouth Disease	9	.1
Fumes	15	.1
Garbage/garbage disposal	2784	27.3
Global Warming	77	.8
Good Weather	13	.1
Greenhouse Effect	21	.2
Gullies	11	.1
Gunman	6	.1
Hand Foot & Mouth Disease	11	.1
Health	18	.2
How To Deal With People	6	.1
Hunger	9	.1
Ignorance	14	.1
Inadequate Rainfall	6	.1
Indiscipline	11	.1
Individuals	7	.1
Infrastructure	10	.1
Jobs	101	1.0
Keep Environment	8	.1
Killing	108	1.1
Lack of Action	7	.1
Lack of Care	9	.1
Lack of Drainage	5	.0
Lack of Education	34	.3
Lack of Funding	10	.1
Lack of Information	6	.1
Lack of Intelligence	8	.1
Lack of Knowledge	64	.7
Lack of Resources	24	.2
Lack Recycling	16	.2
Land	34	.3
Lazy	7	.1
Limestone	11	.1
Low Income	10	.1
Maintenance	10	.1
Mindset Of People	10	.1
Mining	11	.1
Money	36	.4
More Public Health Inspectors	13	.1
Mosquitoes	393	3.8
Murder	7	.1

Nastiness	5	.0
Nasty People	24	.2
No Education	9	.1
No Recycling Facilities	14	.1
No Water	21	.2
Over Population	11	.1
Overcrowded	11	.1
Peer Pressure	12	.1
People	99	1.0
People Behaviour	27	.3
People Treatment Of Place	5	.0
Pesticide	13	.1
Plastic	38	0.3
Politicians	7	.1
Politics	14	.1
Pollution	1561	15.2
Poor	10	.1
Poor Education	13	.1
Poor Planning	10	.1
Poverty	16	.2
Proper Management	11	.1
Recyclables	7	.1
Recycling	29	.3
Rivers	8	.1
Riverton City	13	.1
Roads	187	1.8
Safety	9	.1
Scamming	14	.1
Schools For Dropouts	6	.1
Sea	10	.1
Sea Erosion	11	.1
Sewage	55	.5
Sliding Dollar	14	.1
Smog	11	.1
Smoke	43	.4
Smoke From Factory	21	.2
Smoking	53	.5
Stagnant Water	13	.1
Stealing	6	.1
Street	5	.1
Time We Live In	7	.1
Toxic Waste	21	.2

Uncleanness	7	.1
Unemployment	457	4.5
Unhealthy Things	10	.1
Unplanned Housing	10	.1
Unwanted Pregnancy	10	.1
Vehicles	6	.1
Violence	91	.9
Water/water pollution/water crisis	240	2.4
Work	32	.3

Appendix 22

Table A6: Responses to question – "Most threatened aspects of Jamaica's Environment?" - Question 12

Item	Frequency	Percent
Agriculture	14	.1
Air/atmosphere	891	8.8
Air pollution	12	.1
All areas	20	.2
All around	20	.2
All living things	13	.1
Alpart	27	.3
Animals	24	.2
Area	10	.1
Asthma in children	7	.1
Beach	9	.1
Beaches	84	.8
Blue mountain	11	.1
Bog walk crime	7	.1
Burning	16	.2
Burning of rubbish	5	.0
Bushes	10	.1
Business sector	18	.2
Car exhaust	7	.1
Cesspools	11	.1
Children	25	.2
Children's health	21	.2

Church	8	.1
Citizens	76	.7
City	6	.1
Clarendon	54	.5
Clean drains	25	.2
Cleanliness	6	.1
Climate	14	.1
Climate change	11	.1
Coast	42	.4
Coastal rising	12	.1
Coastline	122	1.2
Cockpit	7	.1
Cockpit area	11	.1
Communities	25	.2
Community	100	1.0
Content	8	.1
Coral reef	7	.1
Country	5	.0
Country side	3	.0
Crime	283	2.8
Crime in west Jamaica	8	.1
Criminals	6	.1
Crocodile in content	8	.1
Deforestation	41	.4
Dirt	7	.1
Disease	14	.1
Do not know	1,509	14.8
Drain cleaning	16	.2
Drainage	4	.0
Drains	48	.5
Drought	19	.2
Dump	25	.2
Dust	23	.2
Economical aspect	13	.1
Economy	22	.2
Ecosystem	16	.2
Education	7	.1
Employment	27	.3
Erosion of beach	10	.1
Everything	6	.1
Everywhere	44	.4
Factory	11	.1

Farming	121	1.2
Fire	45	.4
Fishing industry	55	0.6
Flooding	23	.2
Forrest	220	2.2
Garbage collection/disposal	337	3.2
Garrisons	19	.2
Ghetto	36	.4
Ghetto areas	6	.1
Global warming	40	.4
Goat island	6	.1
Gordon pen	28	.3
Government	7	.1
Government weak	6	.1
Gullies	40	.4
Gully	7	.1
Gunman	6	.1
Health	205	2.0
Health and education	8	.1
Hills	11	.1
Home	4	.0
Homes	17	.2
Homosexuality	4	.0
Hospitals	7	.1
Household	16	.2
Housing	21	.2
Human	13	.1
Infrastructure	5	.0
Inner city	44	.5
Jamaica	13	.1
Killing	39	.4
Kingston	131	1.3
Lack of education	12	.1
Lack of employment	7	.1
Lack of water	16	.2
Land	591	5.8
Land erosion	6	.1
Land pollution	21	.2
Landfill	15	.1
Laziness	6	.1
Littering	17	.2
Live good	8	.1

Lives	23	.2
Low lying areas	7	.1
Lower class people	10	.1
Manchester	9	.1
Mangrove	5	.0
Manufacturing industry	7	.1
Marine life	81	.8
Mining	11	.1
Monkey town	9	.1
Montego bay	24	.3
Mosquitoes	39	.4
Mountain sides	11	.1
Natural habitat	8	.1
Natural resources	19	.2
Nature	10	.1
Negril	14	.1
Noise	15	.1
Non specific	15	.1
Ozone layer	46	.5
People	58	.6
People safety	6	.1
Plants	13	.1
Plastics	25	.2
Pollution	164	1.6
Poor areas	8	.1
Poor drainage	21	.2
Poor road	9	.1
Portland	13	.1
Rainfall	23	.2
Raping	7	.1
Raping at nights	3	.0
Reefs	23	.3
Residents	7	.1
Rivers	201	2.0
Riverton dump	45	0.5
Road	125	1.2
Roads	7	.1
Rockfort	3	.0
Rural area	11	.1
Safety	13	.1
Saint Catherine	6	.1
Saint James	9	.1

School	5	.1
Sea/seashore	398	4.1
Security	21	.2
Sewage	29	.3
Sewage disposal	5	.0
Sky	21	.2
Smoke	14	.1
Soil	6	.1
Southern part	7	.1
Spanish town	28	.3
St James	44	.6
Stench	13	.1
Storm	15	.1
Streets	26	.3
Stress	10	.1
Surrounding	22	.2
Terrain	17	.2
The gullies	7	.1
Tourism	39	.4
Town	56	.6
Transportation	18	.2
Tree	17	.2
Trees	30	.3
Unemployment	110	1.1
Urban	8	.1
Urban areas	17	.2
Urbanization	27	.3
Vegetation	28	.3
Violence	14	.1
Water/Water system/Watershed	1326	13.3
Wild life	64	.7
Work agencies	6	.1
Yallahs Pond	15	.1
Youth	113	1.1

Appendix 23

Table A7: Information on Protecting the Environment Respondents Would Like to Obtain - Question 19

	Frequency	Percent
Advertise on TV	8	.1
Affected areas	6	.1
Anything	37	.4
Brochures	8	.1
Burning	10	.1
Clean gullies	11	.1
Clean surrounding	11	.1
Clean water	27	.3
Coastline protection	5	.1
Community events	10	.1
Community meetings	7	.1
Community awareness	17	.2
Community centre	11	.1
Community events	21	.2
Community meeting	21	.2
Community protection	11	.1
Community street meeting	8	.1
Crocodile	8	.1
Deforestation	11	.1
Disposal	4	.0
Don’t know	74	.7
Drain cleaning	6	.1
Drought	7	.1
Educate	57	.6
Educate public	32	.3
Education	92	.9
Environment	45	.4
Environment; pollution	4	.0
Environmental actions	160	1.6
Environmental care	31	.3
Environmental conditions	11	.1
Environmental destruction	4	.0
Environmental harm and protection	4	.0
Environmental institutions	4	.0
Environmental issues	20	.2
Environmental laws	19	.2

Environmental protection	71	.7
Everything	103	1.0
Flood prevention	8	.1
Flooding	8	.1
Fogging period	8	.1
For parish	15	.1
Garbage collection	21	.2
Garbage disposal	21	.2
Gas pollutants	7	.1
General info	17	.2
Global issues	19	.2
Government input within projects	9	.1
Harmful chemicals	27	.3
Hazards of burning trash	4	.0
Health education	10	.1
Healthy environment	15	.1
How to rid crocodiles	8	.1
Information	273	2.7
Information on TV	15	.1
Keep Jamaica clean	11	.1
Less tax	19	.2
Look at dump	11	.1
Managing garbage	4	.0
Many things	15	.1
Mining & deforestation	15	.1
More ADs	21	.2
More advertisement	5	.1
More info	11	.1
More pamphlets	20	.2
More TV publicity	9	.1
Mosquito info	33	.3
Mosquito prevention	24	.2
Natural resources	7	.1
NEPA in farming	18	.2
Newsletters	11	.1
No water	8	.1
Not sure	70	.7
Pamphlets	10	.1
People listen	6	.1
Pit latrines; garbage disposal	7	.1
Plans to clean drains	19	.2
Pollution	86	.8

Prevention methods	6	.1
Products	27	.3
Proper disposal	14	.1
Protect environment	11	.1
Protecting environment information	6	.1
Public education	10	.1
Radio	5	.0
Reduce light	27	.3
Reduce pollution	11	.1
Regulation	3	.0
Responsibility	15	.1
Road repair schedule	10	.1
School buses	13	.1
Sewage treatment	33	.3
Smell of factory	11	.1
Solution to environmental problems	4	.0
Training	15	.1
TV broadcasts on the environment	6	.1
Waste matter	15	.1
Water	29	.3
Water quality	6	.1
Water system	7	.1
Water; mosquitoes	6	.1
Water and sea levels	6	.1
What affects us	7	.1

Appendix 24

Table A8: Willingness to Participate in Environmental Protection by Location (Sampling Domain) – Questions 24 to 29.

Item	*	*KMA*	*Other towns*	*Rural areas*
Would you be willing to pay more money for environmentally friendly/less harmful products?	*Yes*	*65.9*	*57.1*	*56.4*
	No	*13.2*	*14.3*	*11.1*
	NS	*20.9*	*28.5*	*32.5*
Would you be willing to take part in a community tree planting exercise or programme?	*Yes*	*79.6*	*81.7*	*84.8*
	No	*8.5*	*4.6*	*4.9*
	NS	*11.8*	*13.7*	*10.3*
Would you be willing to join an organization dedicated to the protection of the environment?	*Yes*	*78.0*	*77.1*	*80.7*
	No	*6.5*	*3.3*	*5.2*

	NS	*15.4*	*19.7*	*14.1*
If land was available to you, would you be willing to plant a seedling in your community?	*Yes*	*91.2*	*89.5*	*90.0*
	No	*3.1*	*4.0*	*3.8*
	NS	*5.6*	*6.5*	*6.2*
If "yes" to question 25, would you be willing to care for that young seedling that you have planted?	*Yes*	*92.7*	*91.3*	*93.6*
	No	*0.9*	*1.5*	*0.9*
	NS	*6.4*	*7.2*	*5.3*
If you were living in a community which launched a garbage-recycling programme, would you be willing to take part even if participation was not compulsory?	*Yes*	*84.3*	*82.9*	*85.5*
	No	*5.0*	*1.9*	*2.9*
	NS	*10.6*	*15.2*	*11.6*
Do you think there is anything you can do to help protect the environment?	*Yes*	*75.6*	*62.0*	*58.2*
	No	*6.4*	*4.5*	*6.7*
	NS	*18.0*	*33.5*	*35.1*

NS=not sure

Appendix 25

Table A9: What Can You Do to Help Protect the Environment? – Question 30

Responses	Frequency	Percent
Joining a 4-H Club	27	.3
Accept change	27	.3
Additional knowledge about protecting the environment	6	.1
Air products	6	.1
Anything	19	.2
Anything to help the environment	7	.1
Be more responsible	7	.1
Better garbage disposal	25	.2
Better waste disposal	14	.1
Better waste disposal; use more environmentally friendly products	7	.1
Burn garbage	13	.1
Burn less garbage	30	.3
Bush area	5	.1
Carpooling; start walking	7	.1
Citizens come together to clean the environment	6	.1
Clean	184	1.8
Clean rivers	5	.1
Clean community	14	.1

Clean environment	15	.1
Clean gully	18	.2
Clean ponds	10	.1
Clean rivers	5	.1
Clean up	215	2.1
Clean up area	9	.1
Clean up coastline	5	.1
Clean up community; get other to help	6	.1
Clean up day	29	.3
Clean up more	6	.1
Clean up Rio Cobre; get rid of plastic bottles	6	.1
Clean up the community	13	.1
Clean up; make sure contaminants do not go in the water; talk to people about pit latrines	6	.1
Clean water bodies	27	.3
Cleaning	10	.1
Collect plastic bottles, ask others not to burn plastics	13	.1
Community clean up	11	.1
Community meetings	20	.2
Community talks	8	.1
Continue proper garbage disposal	6	.1
Conserve water	5	.0
Contribute others where necessary	9	.1
Conversation on Jamaica	6	.1
Cutting bush	7	.1
Danger	10	.1
Decrease pollution; less burning of garbage	6	.1
Deforestation	15	.1
Discourage deforestation	8	.1
Dispose of garbage	208	2.0
Don’t burn	128	1.3
Don’t litter	212	2.1
Drive less	19	.2
Eco friendly vehicle	15	.1
Educate	126	1.2
Educate about littering	11	.1
Educate family &friend	11	.1
Educate others	195	1.9
Educate others on protecting the environment	29	.3
Educate people	58	.6
Educate people; help clean community	6	.1
Educate public	88	.9

Educate self	24	.2
Educating public	81	.8
Educate children	7	.1
Encourage neighbours	10	.1
Encourage neighbours to dispose of garbage properly	6	.1
Encourage no burn	8	.1
Encourage others not to dump garbage in gullies	9	.1
Encourage others not to litter	17	.2
Encourage others to dispose of garbage properly	9	.1
Encourage others to help protect the environment	8	.1
Encourage others to practice proper garbage disposal	21	.2
Encourage others to recycle	11	.1
Encourage others to stop burning garbage	19	.2
Encourage others to stop hunting endangered species	9	.1
Encourage people to stop dumping garbage in gullies	16	.2
Encourage recycling	5	.1
Encourage younger generation to clean up surroundings	9	.1
Ensure community garbage is cleaned and put in drums	6	.1
Ensure garbage collectors pay more to get garbage out	4	.0
Environmentally friendly	7	.1
Environmentally friendly products	6	.1
Follow instructions	11	.1
Garbage bins	15	.1
Garbage disposal	36	.4
Garbage storage	15	.1
Gas oil for mosquitoes	5	.0
Get rid of old household items; practice proper garbage disposal	6	.1
Harvest rainwater; use water from washing to water plants	7	.1
Have a community meeting to talk about environmental issues	4	.0
Have town meetings	21	.2
Health conscious	7	.1
Help clean drains	8	.1
Help clean gullies	15	.1
Help clean the drains	21	.2
Help clean up	41	.4
Help clean up; dispose of garbage properly	7	.1
Help educate people on protecting the environment	6	.1
Help nurture trees	6	.1
Help pick up garbage	5	.1
Help to clean	14	.1

Hold others responsible for irresponsible behaviour	7	.1
Inform	30	.3
Inform others about the environment and how to protect it	16	.2
Inform persons about how to treat the environment	6	.1
Inform persons about pollution and things that negatively affect the environment	7	.1
Information	23	.2
Join clubs	42	.4
Join programs dedicated to environmental protection	10	.1
Just try a thing	13	.1
Keep clean	81	.8
Keep community clean; get rid of mosquitoes	6	.1
Keep environment clean	18	.2
Keep environment clean; plant more trees; grow own food	6	.1
Keep household refuse properly contained	14	.1
Keep it clean	6	.1
Keep streets clean	21	.2
Keep surrounding clean	78	.8
Keep surroundings clean	79	.8
Keep surroundings clean and encourage others to do the same	12	.1
Keep surroundings clean and help others to do likewise	8	.1
Keep surroundings clean; dispose of garbage properly	6	.1
Keep surroundings clean; do not spread garbage	6	.1
Keep surroundings clean; plant trees	11	.1
Keep the environment clean	7	.1
Keeping community clean	10	.1
Kill crocodiles	8	.1
Learn more	20	.2
Less burning of garbage	13	.1
Less chemicals	30	.3
Less plastic	20	.2
Less pollution	15	.1
Less waste	6	.1
Less water usage	19	.2
Lessen factory pollution	19	.2
Litter less	24	.2
Litter less; buy environmentally safe products	11	.1
Litter less; clean up more	7	.1
Make changes when things go wrong; talk to citizens	6	.1
Manage solid waste properly; plant trees	6	.1
More activities	18	.2

More garbage receptacle	5	.1
More garbage trucks	4	.0
More positive	11	.1
Mosquito prevention	13	.1
Need more information to do something	7	.1
Neighbour's keeper	13	.1
Neighbourhood collection	5	.1
Neighbourhood watch	18	.2
Not sure	35	.3
Outreach	5	.0
Pack garbage	13	.1
Participate in available programs	6	.1
Patch out the road	7	.1
Pick up plastic off the street	11	.1
Plant flowers and trees; start a recycling project	29	.3
Plant more food	12	.1
Plant more trees	91	.9
Plant seeds	5	.1
Plant trees	128	1.3
Plant trees; clean part of the gully	7	.1
Plant trees; conserve energy; bury garbage instead of burning it	4	.0
Plant trees; practice proper garbage disposal	14	.1
Plant trees; practice proper garbage disposal; be vigilant in activities that will impact the environment	14	.1
Plant trees; use environmentally friendly products	14	.1
Pollute less; recycle	9	.1
Practice better garbage disposal	7	.1
Practice environmental hygiene	7	.1
Practice environmentally friendly behaviour	9	.1
Practice proper disposal of garbage; inform others of the importance of proper garbage disposal	8	.1
Practice proper garbage disposal	241	2.4
Practice proper garbage disposal; encourage others to do the same	8	.1
Practice proper garbage disposal; less burning of garbage	4	.0
Practice proper garbage disposal; separate garbage; recycle	11	.1
Practice proper garbage disposal; use less plastics	21	.2
Practice proper waste disposal	14	.1
Practice proper garbage disposal	6	.1
Proper disposal	567	5.6
Proper garbage disposal	60	.6

Proper storage of garbage	13	.1
Prosecute	11	.1
Protect the trees; practice proper garbage disposal	13	.1
Provide information to help others understand how they can protect the environment and why they should	7	.1
Rake & sweep	11	.1
Recycle	149	1.5
Recycle bottles	56	.5
Recycle plastic	34	.3
Recycle plastics; burn rubbish once a week only	4	.0
Recycle; burn less	13	.1
Recycle; conserve; practice proper garbage disposal	10	.1
Recycle; stop littering; plant more trees	10	.1
Recycle; use environmentally friendly products	6	.1
Recycle; use less disposables	7	.1
Recycling	85	.8
Recycling for plastic containers	14	.1
Recycling programme	19	.2
Reduce use of some sprays	14	.1
Remove bushes	3	.0
Replanting	98	1.0
Report issues; volunteer to clean environment	4	.0
Report unhealthy environment	6	.1
Rid of pesticide	3	.0
Rule implementation	5	.1
Separate garbage	24	.2
Separate garbage; use right gas in motor vehicles	7	.1
Share info	10	.1
Share information on how to protect the environment	4	.0
Social media	11	.1
Sort garbage	13	.1
Speak out	9	.1
Speak up about the environment being destroyed	10	.1
Stop burn	20	.2
Stop burning garbage	188	1.8
Stop burning garbage; conserve water	7	.1
Stop burning garbage; plant more trees	8	.1
Stop burning garbage; stop cutting down trees; practice proper waste disposal	7	.1
Stop burning garbage; stop deposit toxic waste	10	.1
Stop burning garbage; stop throwing garbage in the sea; recycle	10	.1

Stop burning garbage; try to conserve	10	.1
Stop burning plastics	7	.1
Stop crime	15	.1
Stop cutting down trees; stop burning garbage; follow laws	7	.1
Stop dumping in rivers and valleys	8	.1
Stop littering	69	.7
Stop littering; plant more trees	8	.1
Stop littering; tell people not to dynamite fish	7	.1
Stop smoking	21	.2
Stop use pesticide	6	.1
Stop using aerosols; practice better garbage disposal	10	.1
Take care of surroundings	14	.1
Take care of the environment	7	.1
Take to skip; burn less garbage	13	.1
Talk to people	10	.1
Teaching children how to protect the environment	7	.1
Throw garbage in bins for collection instead of burning it	7	.1
Treat the environment better	6	.1
Trim trees	10	.1
Try to stop people from dumping garbage anywhere	7	.1
Use biodegradable products	21	.2
Use eco-friendly products	11	.1
Use environmentally friendly products	19	.2
Use garbage truck	8	.1
Use leaves for organic farming; proper disposal of garbage	7	.1
Use less chemicals	6	.1
Use less chemicals; practice proper garbage disposal	14	.1
Use less electricity	6	.1
Use less hairspray	11	.1
Use less pesticides	13	.1
Use less water; better garbage disposal	10	.1
Warn people about the negatives in relation to the environment	6	.1
Weed road	13	.1

Appendix 26

Table A10: Suggestions on What NEPA Can Do to Help Protect the Environment - Question 46

Abide by law	10	.1
Advertise	20	.2
Advertise more; have community meetings	7	.1
Advertise on TV	8	.1
Advertisements	23	.2
Awareness	15	.1
Be more active	16	.2
Be more vigilant	9	.1
Be more visible	32	.3
Be stricter with those who violate environmental laws	10	.1
Be vigilant in management of environment. Prosecute persons who damage the environment	14	.1
Be vigilant in monitoring activities that negatively impact environment.	14	.1
Be vigilant in monitoring mining areas. Establish education programme for persons in rural areas. Ensure mining companies practice reforestation	14	.1
Better collection	6	.1
Better monitoring of building practices	7	.1
Build schools	7	.1
Clean	15	.1
Clean communities	15	.1
Clean drain often	8	.1
Clean drains	38	.4
Clean gullies	42	.4
Clean gutters	10	.1
Clean the communities	11	.1
Clean town areas	29	.3
Clean up rivers, canals and gullies; educate communities on garbage disposal	6	.1
Clean up the environment	6	.1
Collect garbage frequently	20	.2
Community representative	8	.1
Community activities	15	.1
Community awareness	18	.2
Community forum	27	.3
Community groups	8	.1
Community inspectors	10	.1
Community meetings	109	1.1
Community meetings to raise awareness	6	.1

Community outreach	10	.1
Community safety	7	.1
Community talks	10	.1
Companies	15	.1
Contain dangerous animals	15	.1
Create clubs to raise awareness; put plans in place so persons can do what they should	4	.0
Distribute flyers	8	.1
Do better	11	.1
Do more cleaning up	21	.2
Do more for wildlife	21	.2
Do more work	6	.1
Educate	621	6.1
Educate citizens on environmental matters	14	.1
Educate people on the environment; let people plant more trees; prosecute persons who needlessly cut down trees	7	.1
Educate persons by sending personnel into communities	9	.1
Educate persons in smaller communities; be stricter on garbage disposal; focus more on civil pride	4	.0
Educate public, students	384	3.8
Educate the public more	383	3.8
Educate the public more; hold violators of environmental laws accountable	9	.1
Educate the public more; more community meetings	7	.1
Educate the public more; more community visits	7	.1
Educate using media	7	.1
Educating communities on protecting the environment. Encourage planting of trees, especially in housing developments	14	.1
Education campaign; prosecute violators	6	.1
Education is necessary in schools and communities	6	.1
Educational programs	28	.3
Employ more people to stop idle littering	17	.2
Encourage separation of garbage; prosecute litterers	11	.1
Enforce rules	12	.1
Engage people and educate them	7	.1
Environmental protection programmes	3	.0
Find law to prosecute	7	.1
Fine people who damage the environment	8	.1
Firm decisions	10	.1
Fix sewage	23	.2
Fund recycling program	11	.1
Garbage collection	11	.1

Get a team to help clean up	13	.1
Get more involved with community groups	11	.1
Get people involved	3	.0
Government assistance	7	.1
Have community discussions; have programs from primary school to tertiary	7	.1
Have liaison officers in communities	7	.1
Have meetings in communities regularly	4	.0
Have more interactive programs in communities that are mostly affected	7	.1
Have more projects; educate the public more	10	.1
Have recycling program; education campaign; sort out the Riverton city dump	7	.1
Help fishing industry	5	.1
Help in communities	15	.1
House to house visit to ensure compliance with environmental practices	6	.1
Implement deforestation laws	21	.2
Implement more education programs in schools	6	.1
Implement policies to protect communities	11	.1
Improve garbage collection	6	.1
Increase awareness	20	.2
Increase awareness in schools and communities. Do something about bottles	14	.1
Increase cleaning the environment; garbage collection; de-bushing roadside; mosquito control	4	.0
Increase community relations	11	.1
Increase efforts	19	.2
Increase fines for litterers; set up more signs	10	.1
Increase garbage collection	6	.1
Increase garbage collection; provide more bins	21	.2
Information	25	.2
Infrastructure	6	.1
Intensify public relations programs	11	.1
Island wide clean up	8	.1
Join with other organizations to protect sea and land; more education programs	6	.1
Keep more community meetings; be more visible	8	.1
Keep the environment clean	7	.1
Launch community initiative; have strategy to reach small groups	7	.1
Laws for disposal	27	.3
Lobby for greater policies for existing standards	11	.1

Look about sewage in housing development	6	.1
Look at the markets; more trees	6	.1
Manage trees that overhang sidewalks; be stricter with dumping in gullies, rivers and beaches	4	.0
Mobilize educators	13	.1
Mobilize more	11	.1
Monitor the environment; get inspectors	7	.1
Monitoring environment	10	.1
More activities	6	.1
More ads	29	.3
More advertisement in communities	13	.1
More advertisement; more programs	8	.1
More advertisements; visit schools	10	.1
More collection of garbage	6	.1
More community based interaction	13	.1
More community intervention; TV programme	7	.1
More community involvement	7	.1
More community meetings	7	.1
More drain cleaning	8	.1
More education	15	.1
More education for people in lower socio economic class	7	.1
More education programs	38	.4
More education programs; inspect facilities regularly	7	.1
More education programs; more advertisements and media work	7	.1
More education; be more visible	14	.1
More fogging	28	.3
More funding; public exhibitions	9	.1
More garbage trucks	109	1.1
More interaction	11	.1
More offices	7	.1
More penalties for persons who violate rules of NEPA	8	.1
More proactive	12	.1
More projects	6	.1
More prosecution	10	.1
More public meetings in community	13	.1
More recycling projects	9	.1
More recycling projects; more public education	29	.3
More TV and Radio programs	6	.1
Mosquito prevention	7	.1
Nature tours	7	.1
Organize programs for volunteers	11	.1
Organize clean up	27	.3

Organize system	7	.1
Outreach	248	2.4
People clean rivers	8	.1
Plan school programs	10	.1
Plant more trees	31	.3
Prevent mosquito outbreaks	9	.1
Proactivity	6	.1
Prosecute citizens for pollution	14	.1
Prosecute citizens for pollution. Establish recycling program. Provide bins/skips for garbage disposal	14	.1
Prosecute coal miners	15	.1
Prosecute more people	6	.1
Prosecute people	23	.2
Prosecute persons more	4	.0
Prosecute persons who harm the environment	21	.2
Prosecute violators	42	.4
Prosecute violators of environmental laws	6	.1
Prosecute violators of environmental laws; more public education	29	.3
Prosecute violators of environmental laws; better garbage collection	9	.1
Protect the environment	16	.2
Provide bins	5	.1
Provide bins/skips in communities for garbage disposal. Have better education programmes at community level	14	.1
Provide garbage receptacles. Collect garbage on a regular basis. Provide garbage bags.	13	.1
Provide more education on protecting the environment	14	.1
Provide more education; be more visible	9	.1
Provide more information on their services	6	.1
Provide more jobs	11	.1
Provide trees for housing schemes	7	.1
Public awareness	5	.1
Public clean up	17	.2
Public education on pollution and ill effects of plastic bottles	14	.1
Public visit	35	.3
Radio ads and TV programs	8	.1
Raise awareness	12	.1
Recycling	16	.2
Reduce quantity of smoke coming from factories	21	.2
Regular garbage collection	27	.3
Replanting	23	.2
Rid crocodiles	16	.2
Riverton dump relocation	6	.1

Search all gullies for alligators and remove them	6	.1
Send field officers to rural areas to educate citizens	6	.1
Send garbage trucks more frequently	8	.1
Send more garbage trucks	13	.1
Send more garbage trucks; more public education	29	.3
Send representatives to individual communities	9	.1
Serious measures for littering	3	.0
Sewage	21	.2
Social programs to inform public	3	.0
Spray mosquitoes	10	.1
Stricter laws to protect the environment	8	.1
Town hall meetings; have a branch in each parish so citizens can retrieve information	6	.1
Visible in communities	20	.2
Visit communities	8	.1
Visit communities more often	21	.2
Visit community often	29	.3
Visit more communities	6	.1
Visit schools and churches	8	.1
Work	7	.1
Work in rural areas	6	.1
Work with community members to clean	6	.1

Appendix 27

Selection & Training of Personnel for the Study

Selection of Supervisors

Four supervisors were selected to represent each of four health Regions in the Island. This was of no real significance, in relation to the data analysis, but of strategic importance in relation to their experience in covering the entire fourteen parishes, and the ease of selecting targeted resources like the interviewers.

Selection of Interviewers

With the help of the four supervisors – one in each Health Region twenty-two interviewers were carefully selected according to their location in the selected division for the data collection in the respective parish. Apart from proximity, other important criteria was used to select those individuals - integrity/trustworthiness, at least high school education, be able to read and write very well, experience in conducting survey interviews, being a citizens of Jamaica, and confidentiality.

Training

A one-day training seminar was conducted in which the interviewers were trained in administering the questionnaire in particular, and other aspects relevant to the study's data collection process. It should be noted that all four supervisors were at the training of interviewers; some facilitated selected aspects of the training.

Appendix 28

SAMPLE DESIGN METHODOLOGY

Knowledge, Attitudes and Perception Survey on the Environment

CLIENT:	National Environment & Planning Agency (NEPA)
REQUESTED BY:	Mr Michael Kington – Consultant
DATE OF REQUEST:	July 20, 2015
PREPARED BY:	Mr Stuart Brown - Senior Statistician Research, Design and Evaluation Division Statistical Institute of Jamaica
DATE PREPARED:	September 18, 2015
REVIEWED BY:	Ms Leesha Delatie-Budair - Director Research, Design and Evaluation Division Statistical Institute of Jamaica
APPROVAL DATE:	September 22, 2015
CLIENT'S REQUEST:	To design for a nationally representative sample of individuals that meets the stated objectives of the survey and produces estimates with an acceptable level of precision for each sampling domain.

Background and Purpose of the Survey

The primary purpose of this survey is to assess the knowledge, attitudes and practices of Jamaicans regarding to the environment. This survey is the third in a series of periodic surveys conducted by or on behalf of the Government of Jamaica; the first survey in this series was conducted in 1991 and the second in 1998.

Other objectives of this survey include:

1. An assessment of any changes over the past fifteen (15) years in the public's knowledge, attitudes and practices as it relates to the environment
2. An assessment of the public's view of NEPA
3. To provide an analysis of the effectiveness of the NEPA in carrying out the public education aspect of its mandate and the extent to which this may have impacted the public's knowledge, attitudes, practices and behaviours.

Sample Domains

The sample domains are defined as the analytical subgroups for which equally reliable estimates are required. The agreed sampling domains (h) for this survey are:

1. Kingston Metropolitan Area (KMA)
2. Other Towns (OT)
3. Rural Areas (RA)

Target Population

The target population for this survey are usual residents at least eighteen (18) years old, who are living in private dwelling units at the time of the survey. Excluded from this, and most household surveys in Jamaica are persons living in non-private dwellings including group dwellings such as military camps, mental institutions, hospitals and prisons.

According to the 2011 Population and Housing Census, a total of 2,697,983 persons are usually resident in Jamaica. This total comprises 2,678,629 persons in private dwellings, 18,420 in institutions and 934 persons enumerated on the streets. Persons living in private dwelling units account for 99.3% of the Jamaican population.

Based on the 2011 Census, the target population of usual residents aged eighteen (18) years or older account for 67.5% of the Jamaican population.

Sample Design

The design for this survey is a multi-stage stratified cluster probability sample with three stages of selection. The sample is selected in stages to maximize its efficiency. The stratification of the sample ensures an adequate spread of the sample within the sampling domains and across the fourteen (14) parishes of Jamaica. The clustering of survey elements in this sample design allows for a reduction in administrative, travel and other data collection costs. The three stages of this sample design are:

- **Stage 1**: Selection of Enumeration Districts (EDs)
- **Stage 2**: Selection of dwelling units
- **Stage 3**: Selection of respondents

STRATIFICATION

Strata are independent and mutually exclusive subsets of the population. Within each stratum, sample elements are selected independently, as each ED in Jamaica is wholly contained in one and only one of the strata identified for this survey. The sample is explicitly stratified by the three domains specified earlier, namely the Kingston Metropolitan Area (KMA), Other Towns (OT) and Rural Areas (RA). The KMA consists of the parish of Kingston (all urban) and the urban areas of St. Andrew. Other Towns consists of the parish capitals and other urban areas not in the KMA, and Rural Areas consists of all the remaining areas not in KMA or OTs. Within each domain, the sample is implicitly stratified[1] by parish.

CLUSTERING

During the first stage of sampling, clusters of dwellings i.e. the enumeration districts (EDs) are selected. Within each cluster, a fixed number of dwellings are selected systematically to be representative of that ED. This allows for better management of interviewer workload, the sample size and survey costs.

SAMPLE FRAME

The sampling frame is based on the data and cartographic materials from the 2011 Population and Housing Census conducted by the Statistical Institute of Jamaica (STATIN). Data from the Census is used to examine the distribution of households, dwellings and the target population across the specified sampling domains. The cartographic materials from the 2011 Population and Housing Census are used to locate the selected dwellings.

The sample frame is organized based on the list of Enumeration Districts (EDs) canvassed by STATIN for the ***2011 Population & Housing Census***. EDs are geographically defined collections of dwelling units used by STATIN specifically for survey purposes. An ED is either urban or rural, with average size of 150 dwellings for urban and 100 dwellings for rural. EDs are defined in such a way to ensure that each ED:

1. Is wholly contained within one of Jamaica's fourteen parishes
2. Is entirely urban or rural
3. Contains approximately the same number of dwellings

SAMPLE SIZE

The sample size per stratum (n_h) is determined based on the following key assumptions:

1. The desired level of confidence for key estimates is 95%. This is represented by the value of the corresponding two-tailed z-statistic ($z\alpha_{/2}$).
2. Among the main survey indicators to be measured, the proportion of the population that is aware of NEPA is assumed to be the smallest proportion. In other words, the proportion of persons who are aware of the environment and environmental issues is expected to be at least equal to the proportion of persons who are aware of NEPA. As such, the sample size that suits this indicator will also yield reliable estimates for the other core indicators.
    a. The proportion of persons who are aware of NEPA (p) is conservatively assumed to be at least 50% of the target population.

[1] Sorted prior to selection

3. The anticipated response rate (r) for this survey is 80%. This is a conservative assumption based on current trends in response rates in household surveys in Jamaica.
4. Based on the 2011 Census 99.8% of dwellings are expected to have at least one eligible respondent (i).
5. The desired margin of error (e) of the estimates is 5%.

EQUATION 1: SAMPLE SIZE FORMULA

$$n_h = \frac{z^2_{\alpha/2} \times p(1-p)}{i \times e^2 \times r} \approx 480$$

Given that there are three strata, the total sample size is therefore:

$$480 \times 3 = 1{,}440\ dwellings$$

Cluster Size and the Number of PSUs

As indicated previously, enumeration districts which are geographical units are used as the clusters for this survey. As such, it is anticipated that there will be some degree of homogeneity among the sampled households with respect to certain social and demographic characteristics. As such, a smaller number of sample elements selected per ED would increase the precision and efficiency of the survey. This desire for increased precision and efficiency must however be balanced against costs[2]. To achieve this balance, it was determined that twenty (20) dwellings should be selected per ED.

TABLE 1: CLUSTER SIZE OPTIONS

		Option 1	Option 2	Option 3
Expected Design Effect	f	4.6	3.9	3.1
Expected Intra-class Correlation Coefficient	ρ	0.15	0.15	0.15
Cluster Size	k	25	20	15
Number of PSUs - Total	m	58	72	96
Number of PSUs - Per Domain	m_h	20	24	32
Sample Size	n	**1,440**	**1,440**	**1,440**

Sample Allocation

A number of options may be considered for the distribution of the sample across the sampling domains; the two best suited options, proportionate allocation and equal sample size allocation, are considered here. All other things being equal, proportionate allocation is the most suitable for producing national estimates and subgroup estimates where the subgroups are evenly distributed. On the other hand, equal sample size allocation is the most suitable for producing regional/subgroup estimates. It is assumed that the precision of regional/subgroup estimates should take precedence over the precision of national estimates.

[2] The cluster size is inversely related to the number of primary sampling units to be canvassed during the survey.

TABLE 2: SAMPLE DISTRIBUTION UNDER PROPORTIONATE AND EQUAL ALLOCATION

	Proportion of Total Dwellings	Sample Allocation			
		Proportionate		Equal	
		Dwellings	EDs	Dwellings	EDs
KMA	0.22	317	16	480	24
Other Towns	0.32	461	23	480	24
Rural Areas	0.46	662	33	480	24
Jamaica	**1.00**	**1,440**	**72**	**1,440**	**72**

The proportionate allocation would not yield estimates at the required level of precision in two (2) of the three domains identified in this survey as the subgroups are not evenly distributed. The equal allocation however, will yield reliable estimates in all three domains and as such this is the method used to distribute the sample.

SAMPLE SELECTION

STAGE 1: SELECTION OF EDS

The first stage involves the selection of Primary Sampling Units (PSUs), which are area units based on census enumeration districts. During the first stage of selection, PSUs are selected within each sampling domain with probability proportionate to size. The dwelling count, according to the 2011 Census, is used as the measure of size.

EQUATION 2: FIRST STAGE PROBABILITY OF SELECTION

$$\frac{P_d \times H_{dj}}{\sum_d H_j}$$

Where:

- P_d is the total number of primary sampling units to be selected
- H_{dj} is the total number of dwellings in the *j*-th PSU in domain *d*
- $\sum_d H_j$ is the total number of dwellings in domain *d*

Within each stratum, twenty-four (24) EDs are selected. Despite implicit stratification by parish, the resulting sample did not include the parish of Hanover in the Other Towns stratum. As such, for representativeness, one urban ED from Hanover was purposively included in the sample.

STAGE 2: SELECTION OF DWELLING UNITS

Generally, a dwelling unit is any building or separate and independent part of a building in which a person or group of persons are living at the time of the survey, while a household consists of one person who lives alone or a group of persons who, as a unit, jointly occupies the whole or part of a dwelling unit, who have common arrangements for housekeeping, and who generally share at least one meal.

This sample design employs the selection of dwelling units as the Secondary Sampling Units (SSU). Based on the 2011 Census estimates, there are 1.03 households per dwelling. In most cases, there will be only one household per selected dwelling unit. In cases where there are more than one household in a dwelling unit, the interviewer will be required to select one household to be representative of the selected dwelling. To maintain the probability

design of the sample, and its associated benefits, it is important that the selection of households be done randomly.

The selection of households may be done using the following random selection approach:

1. The interviewer assigns a number to each household found in the selected dwelling
2. The interviewer blindly selects a number between 1 and the total number of households found
3. The interviewer interviews the selected household only
4. The interviewer records all steps taken during the selection process.

EQUATION 3: SECOND STAGE PROBABILITY OF SELECTION

$$\frac{k}{H_{dj}}, k = 20$$

Where:

- k the number of dwellings selected per PSU
- H_{dj} is the total number of dwellings in the *j*-th PSU in domain *d*

Dwelling units are selected systematically with a random start within each selected ED to ensure an adequate geographic spread throughout the ED.

STAGE 3: SELECTION OF RESPONDENTS

The third stage involves the selection of one eligible respondent within each household as the Ultimate Sampling Unit (USU). In cases where there is more than one eligible respondent in a household, the respondent is selected by the interviewer using the "Next Birthday" method which is a random selection method that is generally accepted as an appropriate within household selection technique. This method involves the selection of the eligible respondent with the nearest up-coming birthdate to the date of interview.

Appendix I. GLOSSARY

Dwelling Unit

A Dwelling Unit is any building or separate and independent part of a building in which a person or group of persons are living at the time of the survey. The essential features of a dwelling are *"separateness and independence"*. Occupiers of a dwelling unit must have free access to the street by their own separate and independent entrance(s) without having to pass through the living quarters of another household.

(a) An enclosure is *separate* if surrounded by walls or other forms of partitioning and covered by a roof so that a person or group of persons can isolate themselves from other persons for purposes of sleeping, preparing and sharing meals.

(b) It is *independent* when it has direct access from the street or common landing, staircase, passage or gallery; when occupants can come in and go out of it without passing through anybody else's accommodation.

Household

The census definition of a household is applied in all household surveys conducted by STATIN. A household is defined as either:

(a) A one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; or

(b) A multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their resources and have a common budget; they may be related or unrelated persons or a combination of persons both related and unrelated. This arrangement exemplifies the "housekeeping" concept.

For purposes of the survey, the following are some of the characteristics or distinctions in living arrangements, which were adopted to determine private households:

(i) Occupants of a single housing structure who live together and eat together.

(ii) Occupants of more than one housing structure, who live in a manner such that they share meals and the members of the subsidiary housing structure, have access to rooms in the main housing structure.

(iii) Occupants of one of a series of self-contained flats under one or under several different roofs. By self-contained is meant having its own bathroom, toilet and kitchen facilities.

(iv) Occupants of a room or number of rooms rented to a person or group of persons, "unrelated" to the occupants of the other rooms, provided that the group of persons comply with the definitions of a household given above; that is, that they live together and share meals together.

(v) An occupant of a room in a housing structure, in the capacity of a lodger, who does not share meals with the other occupants and who has a separate private entrance to his room.

(vi) An occupant of an out-building, who does not share meals with the occupants of the main household. Such a person may or may not be employed to work in the main household. In the case of an employee who does not live in the building occupied by the main household, but who does, in fact, share meals with the main household, the employee is considered as constituting a part of the main household, providing the building occupied by the employee is within the compound of that occupied by the main household.

(vii) A domestic employee who sleeps in the house or in an out-building on the premises is to be listed as a member of the household if he or she sleeps there on an average of at least four nights per week and shares at least one meal daily. If there are children living on the premises, all members of this family are to be included with the main household if they share meals with the main household. If there are separate arrangements for cooking they should be considered as a separate household.

(viii) In the case of a tenement yard where there is a series of rooms rented to different persons by the landlord, each person or group of persons who live and share meals together is regarded as a

separate household. A household in this special context may share external bathroom, toilet or even kitchen facilities with other similar households.

Usual Place of Residence

For the administration of the survey and to reduce the risk of double counting[3], household membership is determined based on the place of usual residence. In general, "***usual residence***" is defined as the place at which the person lives at the time of the survey, and has been there for some time or intends to stay there for some time. A person's usual place of residence is defined as the place at which the person has lived continuously for most of the last 12 months (that is, for at least six months and one day), not including temporary absences for holidays or work assignments, or intends to live for at least six months.

The following cases should be noted when determining the usual place of residence:

i. For persons with more than one home, usual residence will be the one at which the person spends the greater part of the year. Thus, in the case of an individual who has more than one place of residence because his/her work, the usual residence should be that place, be it a residence or lodging in which at least four nights of the week on average are usually spent.
ii. Fishermen away at sea are considered to have their usual place of residence in the dwelling where they live when ashore.
iii. Seamen or crew members on a vessel which plies between Jamaica and foreign ports are considered to reside on the vessel rather than at home.
iv. Air pilots are considered to have their usual place of residence in the household if they usually spend most of their off duty periods in Jamaica and they live in that dwelling for most of the time.
v. Persons engaged in shift work or who work at nights, such as security workers are to be enumerated as members of the household of their usual residence.
vi. Farm workers away for less than six months are to be included as part of the household where they usually live. If, however, they have been abroad for six months or more or intend to be away for that period then they are not to be regarded as usual residents.
vii. It is important to note that where a person has recently moved in with a group of persons, as long as he/she intends to make his/her home with them, that person is to be considered a member of the household.

[3] Each person should have one and only one place of usual residence.

Appendix II. DISTRIBUTION OF THE SAMPLE PARISH AND STRATA

Parish	Proportion of Total Dwellings Within Strata[1]				Sample Dwellings[2]				Sample EDs @ 20 Dwellings per ED			
	KMA	OUC	Rural	ALL	KMA	OUC	Rural	ALL	KMA	OUC	Rural	ALL
Kingston	0.25	0.00	0.00	0.08	120	0	0	120	6	0	0	6
St. Andrew	0.75	0.00	0.00	0.25	360	0	0	360	18	0	0	18
St. Thomas	0.00	0.05	0.03	0.03	0	20	20	40	0	1	1	2
Portland	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
St. Mary	0.00	0.05	0.06	0.04	0	20	20	40	0	1	1	2
St. Ann	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
Trelawny	0.00	0.05	0.09	0.05	0	20	60	80	0	1	3	4
St. James	0.00	0.10	0.06	0.05	0	40	20	60	0	2	1	3
Hanover[3]	0.00	0.00	0.09	0.03	0	20	40	60	0	1	2	3
Westmoreland	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
St. Elizabeth	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
Manchester	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
Clarendon	0.00	0.10	0.12	0.07	0	40	60	100	0	2	3	5
St. Catherine	0.00	0.43	0.09	0.17	0	220	60	280	0	11	3	14
ALL	**1.00**	**1.00**	**1.00**	**1.00**	**480**	**480**	**480**	**1,440**	**24**	**24**	**24**	**72**

[1] Source: Population and Housing Census 2011

[2] Calculated figures approximated to multiples of 20 to return whole EDs

[3] One urban ED purposively added in sample and one rural ED removed.

Appendix II. DISTRIBUTION OF THE SAMPLE PARISH AND STRATA

Parish	Proportion of Total Dwellings Within Strata[1]				Sample Dwellings[2]				Sample EDs @ 20 Dwellings per ED			
	KMA	OUC	Rural	ALL	KMA	OUC	Rural	ALL	KMA	OUC	Rural	ALL
Kingston	0.25	0.00	0.00	0.08	120	0	0	120	6	0	0	6
St. Andrew	0.75	0.00	0.00	0.25	360	0	0	360	18	0	0	18
St. Thomas	0.00	0.05	0.03	0.03	0	20	20	40	0	1	1	2
Portland	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
St. Mary	0.00	0.05	0.06	0.04	0	20	20	40	0	1	1	2
St. Ann	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
Trelawny	0.00	0.05	0.09	0.05	0	20	60	80	0	1	3	4
St. James	0.00	0.10	0.06	0.05	0	40	20	60	0	2	1	3
Hanover[3]	0.00	0.00	0.09	0.03	0	20	40	60	0	1	2	3
Westmoreland	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
St. Elizabeth	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
Manchester	0.00	0.05	0.09	0.05	0	20	40	60	0	1	2	3
Clarendon	0.00	0.10	0.12	0.07	0	40	60	100	0	2	3	5
St. Catherine	0.00	0.43	0.09	0.17	0	220	60	280	0	11	3	14
ALL	**1.00**	**1.00**	**1.00**	**1.00**	**480**	**480**	**480**	**1,440**	**24**	**24**	**24**	**72**

[1] Source: Population and Housing Census 2011

[2] Calculated figures approximated to multiples of 20 to return whole EDs

[3] One urban ED purposively added in sample and one rural ED removed.

Appendix III. SAMPLE EDs -KAP SURVEY ON THE ENVIRONMENT

No.	Parish	ED	Total Dwellings	Area	Selection Probability	Sampling Weight
1	KINGSTON	C 49	188	KMA	0.17750	5.6339
2	KINGSTON	C 69	156	KMA	0.14729	6.7895
3	KINGSTON	E 2	159	KMA	0.15012	6.6614
4	KINGSTON	E 57	379	KMA	0.35783	2.7946
5	KINGSTON	W 25	157	KMA	0.14823	6.7463
6	KINGSTON	W 55	116	KMA	0.10952	9.1307
7	ST. ANDREW	E 32	120	KMA	0.08772	11.4000
8	ST. ANDREW	E 34	136	KMA	0.09942	10.0588
9	ST. ANDREW	ER 92	202	KMA	0.14766	6.7723
10	ST. ANDREW	NC 12	208	KMA	0.15205	6.5769
11	ST. ANDREW	NC 24	143	KMA	0.10453	9.5664
12	ST. ANDREW	NC 58	217	KMA	0.15863	6.3041
13	ST. ANDREW	NE 53	127	KMA	0.09284	10.7717
14	ST. ANDREW	NE 9	207	KMA	0.15132	6.6087
15	ST. ANDREW	NW 113	144	KMA	0.10526	9.5000
16	ST. ANDREW	NW 15	172	KMA	0.12573	7.9535
17	ST. ANDREW	S 27	170	KMA	0.12427	8.0471
18	ST. ANDREW	S 46	289	KMA	0.21126	4.7336
19	ST. ANDREW	S 5	151	KMA	0.11038	9.0596
20	ST. ANDREW	SE 26	234	KMA	0.17105	5.8462
21	ST. ANDREW	SW 61	334	KMA	0.24415	4.0958
22	ST. ANDREW	W 34	307	KMA	0.22442	4.4560
23	ST. ANDREW	W 63	273	KMA	0.19956	5.0110
24	ST. ANDREW	WC 25	265	KMA	0.19371	5.1623
25	ST. THOMAS	W 102	177	RURAL	0.06652	15.0339
26	ST. THOMAS	W 109	313	OUC	0.25911	3.8594
27	PORTLAND	E 108	194	RURAL	0.07810	12.8041
28	PORTLAND	E 23	195	OUC	0.12334	8.1077
29	PORTLAND	W 45	171	RURAL	0.06884	14.5263
30	ST. MARY	C 53	108	RURAL	0.03460	28.8981
31	ST. MARY	C 73	198	OUC	0.17158	5.8283
32	ST. ANN	NE 77	183	OUC	0.06818	14.6667
33	ST. ANN	SE 63	159	RURAL	0.08357	11.9654
34	ST. ANN	SE 71	177	RURAL	0.09304	10.7486
35	TRELAWNY	N 103	194	OUC	0.18494	5.4072
36	TRELAWNY	N 3	223	RURAL	0.15547	6.4320
37	TRELAWNY	N 9	262	RURAL	0.18266	5.4746

No.	Parish	ED	Total Dwellings	Area	Selection Probability	Sampling Weight
38	TRELAWNY	S 19	107	RURAL	0.07460	13.4050
39	ST. JAMES	C 3	259	OUC	0.12322	8.1158
40	ST. JAMES	S 22	117	RURAL	0.03756	26.6239
41	ST. JAMES	WC 57	109	OUC	0.05186	19.2844
42	HANOVER	E 57	224	RURAL	0.10235	9.7701
43	HANOVER	W 15	215	OUC	0.27995	3.5721
44	HANOVER	W 77	215	RURAL	0.09824	10.1791
45	WESTMORELAND	C 45	197	RURAL	0.09952	10.0482
46	WESTMORELAND	W 2	105	OUC	0.05949	16.8095
47	WESTMORELAND	W 99	145	RURAL	0.07325	13.6517
48	ST. ELIZABETH	NE 77	143	OUC	0.14896	6.7133
49	ST. ELIZABETH	NW 64	155	RURAL	0.06736	14.8452
50	ST. ELIZABETH	SE 8	172	RURAL	0.07475	13.3779
51	MANCHESTER	C 79	118	RURAL	0.05567	17.9619
52	MANCHESTER	NW 85	214	RURAL	0.10097	9.9042
53	MANCHESTER	S 49	305	OUC	0.11440	8.7410
54	CLARENDON	N 63	218	RURAL	0.12340	8.1040
55	CLARENDON	SE 45	181	OUC	0.10089	9.9116
56	CLARENDON	SE 53	86	RURAL	0.04868	20.5426
57	CLARENDON	SE 72	158	OUC	0.08807	11.3544
58	CLARENDON	SW 35	217	RURAL	0.12283	8.1413
59	ST. CATHERINE	C 12	143	OUC	0.10866	9.2034
60	ST. CATHERINE	C 44	143	OUC	0.10866	9.2034
61	ST. CATHERINE	C 45	291	OUC	0.22111	4.5226
62	ST. CATHERINE	C 55	141	OUC	0.10714	9.3340
63	ST. CATHERINE	E 21	206	OUC	0.15652	6.3888
64	ST. CATHERINE	E 58	205	OUC	0.15576	6.4200
65	ST. CATHERINE	EC 53	125	OUC	0.09498	10.5287
66	ST. CATHERINE	NC 28	193	OUC	0.14665	6.8191
67	ST. CATHERINE	NC 35	265	RURAL	0.17990	5.5585
68	ST. CATHERINE	NC 47	191	RURAL	0.12967	7.7120
69	ST. CATHERINE	NW 55	198	RURAL	0.13442	7.4394
70	ST. CATHERINE	SC 23	189	OUC	0.14361	6.9634
71	ST. CATHERINE	SC 69	218	OUC	0.16564	6.0371
72	ST. CATHERINE	SW 75	246	OUC	0.18692	5.3500

Appendix IV. SAMPLE DWELLINGS

No.	Parish	ED	Area	Total Dwellings	Dwellings Required	Sampling Interval	Selected Dwellings																	
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	KINGSTON	C 49	KMA	188	20	9.4	6	15	24	33	42	51	60	69	78	87	96	105	114	123	132	141	150	159	168	177
2	KINGSTON	C 69	KMA	156	20	7.8	1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153
3	KINGSTON	E 2	KMA	159	20	8.0	3	11	19	27	35	43	51	59	67	75	83	91	99	107	115	123	131	139	147	155
4	KINGSTON	E 57	KMA	379	20	19.0	8	27	46	65	84	103	122	141	160	179	198	217	236	255	274	293	312	331	350	369
5	KINGSTON	W 25	KMA	157	20	7.9	7	15	23	31	39	47	55	63	71	79	87	95	103	111	119	127	135	143	151	157
6	KINGSTON	W 55	KMA	116	20	5.8	3	9	15	21	27	33	39	45	51	57	63	69	75	81	87	93	99	105	111	116
7	ST. ANDREW	E 32	KMA	120	20	6.0	2	8	14	20	26	32	38	44	50	56	62	68	74	80	86	92	98	104	110	116
8	ST. ANDREW	E 34	KMA	136	20	6.8	2	9	16	23	30	37	44	51	58	65	72	79	86	93	100	107	114	121	128	135
9	ST. ANDREW	ER 92	KMA	202	20	10.1	6	16	26	36	46	56	66	76	86	96	106	116	126	136	146	156	166	176	186	196
10	ST. ANDREW	NC 12	KMA	208	20	10.4	4	14	24	34	44	54	64	74	84	94	104	114	124	134	144	154	164	174	184	194
11	ST. ANDREW	NC 24	KMA	143	20	7.2	3	10	17	24	31	38	45	52	59	66	73	80	87	94	101	108	115	122	129	136
12	ST. ANDREW	NC 58	KMA	217	20	10.9	7	18	29	40	51	62	73	84	95	106	117	128	139	150	161	172	183	194	205	216
13	ST. ANDREW	NE 53	KMA	127	20	6.4	2	8	14	20	26	32	38	44	50	56	62	68	74	80	86	92	98	104	110	116
14	ST. ANDREW	NE 9	KMA	207	20	10.4	3	13	23	33	43	53	63	73	83	93	103	113	123	133	143	153	163	173	183	193
15	ST. ANDREW	NW 113	KMA	144	20	7.2	4	11	18	25	32	39	46	53	60	67	74	81	88	95	102	109	116	123	130	137
16	ST. ANDREW	NW 15	KMA	172	20	8.6	8	17	26	35	44	53	62	71	80	89	98	107	116	125	134	143	152	161	170	172
17	ST. ANDREW	S 27	KMA	170	20	8.5	1	10	19	28	37	46	55	64	73	82	91	100	109	118	127	136	145	154	163	170
18	ST. ANDREW	S 46	KMA	289	20	14.5	7	22	37	52	67	82	97	112	127	142	157	172	187	202	217	232	247	262	277	289
19	ST. ANDREW	S 5	KMA	151	20	7.6	5	13	21	29	37	45	53	61	69	77	85	93	101	109	117	125	133	141	149	151
20	ST. ANDREW	SE 26	KMA	234	20	11.7	10	22	34	46	58	70	82	94	106	118	130	142	154	166	178	190	202	214	226	234
21	ST. ANDREW	SW 61	KMA	334	20	16.7	14	31	48	65	82	99	116	133	150	167	184	201	218	235	252	269	286	303	320	334
22	ST. ANDREW	W 34	KMA	307	20	15.4	8	23	38	53	68	83	98	113	128	143	158	173	188	203	218	233	248	263	278	293
23	ST. ANDREW	W 63	KMA	273	20	13.7	7	21	35	49	63	77	91	105	119	133	147	161	175	189	203	217	231	245	259	273
24	ST. ANDREW	WC 25	KMA	265	20	13.3	2	15	28	41	54	67	80	93	106	119	132	145	158	171	184	197	210	223	236	249
25	ST. THOMAS	W 102	RURAL	177	20	8.9	2	11	20	29	38	47	56	65	74	83	92	101	110	119	128	137	146	155	164	173
26	ST. THOMAS	W 109	OUC	313	20	15.7	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	270	286	302	313

No.	Parish	ED	Area	Total Dwellings	Dwellings Required	Sampling Interval	Selected Dwellings																	
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
27	PORTLAND	E 108	RURAL	194	20	9.7	7	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	194
28	PORTLAND	E 23	OUC	195	20	9.8	1	11	21	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191
29	PORTLAND	W 45	RURAL	171	20	8.6	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140	149	158	167	171
30	ST. MARY	C 53	RURAL	108	20	5.4	2	7	12	17	22	27	32	37	42	47	52	57	62	67	72	77	82	87	92	97
31	ST. MARY	C 73	OUC	198	20	9.9	5	15	25	35	45	55	65	75	85	95	105	115	125	135	145	155	165	175	185	195
32	ST. ANN	NE 77	OUC	183	20	9.2	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
33	ST. ANN	SE 63	RURAL	159	20	8.0	1	9	17	25	33	41	49	57	65	73	81	89	97	105	113	121	129	137	145	153
34	ST. ANN	SE 71	RURAL	177	20	8.9	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140	149	158	167	176
35	TRELAWNY	N 103	OUC	194	20	9.7	6	16	26	36	46	56	66	76	86	96	106	116	126	136	146	156	166	176	186	194
36	TRELAWNY	N 3	RURAL	223	20	11.2	6	17	28	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204	215
37	TRELAWNY	N 9	RURAL	262	20	13.1	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260
38	TRELAWNY	S 19	RURAL	107	20	5.4	4	9	14	19	24	29	34	39	44	49	54	59	64	69	74	79	84	89	94	99
39	ST. JAMES	C 3	OUC	259	20	13.0	3	16	29	42	55	68	81	94	107	120	133	146	159	172	185	198	211	224	237	250
40	ST. JAMES	S 22	RURAL	117	20	5.9	4	10	16	22	28	34	40	46	52	58	64	70	76	82	88	94	100	106	112	117
41	ST. JAMES	WC 57	OUC	109	20	5.5	3	9	15	21	27	33	39	45	51	57	63	69	75	81	87	93	99	105	111	109
42	HANOVER	E 57	RURAL	224	20	11.2	10	21	32	43	54	65	76	87	98	109	120	131	142	153	164	175	186	197	208	219
43	HANOVER	W 15	OUC	215	20	10.8	7	18	29	40	51	62	73	84	95	106	117	128	139	150	161	172	183	194	205	215
44	HANOVER	W 77	RURAL	215	20	10.8	4	15	26	37	48	59	70	81	92	103	114	125	136	147	158	169	180	191	202	213
45	WESTMORELAND	C 45	RURAL	197	20	9.9	1	11	21	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191
46	WESTMORELAND	W 2	OUC	105	20	5.3	2	7	12	17	22	27	32	37	42	47	52	57	62	67	72	77	82	87	92	97
47	WESTMORELAND	W 99	RURAL	145	20	7.3	2	9	16	23	30	37	44	51	58	65	72	79	86	93	100	107	114	121	128	135
48	ST. ELIZABETH	NE 77	OUC	143	20	7.2	5	12	19	26	33	40	47	54	61	68	75	82	89	96	103	110	117	124	131	138
49	ST. ELIZABETH	NW 64	RURAL	155	20	7.8	4	12	20	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140	148	155
50	ST. ELIZABETH	SE 8	RURAL	172	20	8.6	4	13	22	31	40	49	58	67	76	85	94	103	112	121	130	139	148	157	166	172
51	MANCHESTER	C 79	RURAL	118	20	5.9	1	7	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97	103	109	115
52	MANCHESTER	NW 85	RURAL	214	20	10.7	4	15	26	37	48	59	70	81	92	103	114	125	136	147	158	169	180	191	202	213
53	MANCHESTER	S 49	OUC	305	20	15.3	12	27	42	57	72	87	102	117	132	147	162	177	192	207	222	237	252	267	282	297
54	CLARENDON	N 63	RURAL	218	20	10.9	6	17	28	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204	215

No.	Parish	ED	Area	Total Dwellings	Dwellings Required	Sampling Interval	Selected Dwellings																			
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
55	CLARENDON	SE 45	OUC	181	20	9.1	7	16	25	34	43	52	61	70	79	88	97	106	115	124	133	142	151	160	169	178
56	CLARENDON	SE 53	RURAL	86	20	4.3	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77
57	CLARENDON	SE 72	OUC	158	20	7.9	2	10	18	26	34	42	50	58	66	74	82	90	98	106	114	122	130	138	146	154
58	CLARENDON	SW 35	RURAL	217	20	10.9	6	17	28	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204	215
59	ST. CATHERINE	C 12	OUC	143	20	7.2	3	10	17	24	31	38	45	52	59	66	73	80	87	94	101	108	115	122	129	136
60	ST. CATHERINE	C 44	OUC	143	20	7.2	5	12	19	26	33	40	47	54	61	68	75	82	89	96	103	110	117	124	131	138
61	ST. CATHERINE	C 45	OUC	291	20	14.6	13	28	43	58	73	88	103	118	133	148	163	178	193	208	223	238	253	268	283	291
62	ST. CATHERINE	C 55	OUC	141	20	7.1	3	10	17	24	31	38	45	52	59	66	73	80	87	94	101	108	115	122	129	136
63	ST. CATHERINE	E 21	OUC	206	20	10.3	2	12	22	32	42	52	62	72	82	92	102	112	122	132	142	152	162	172	182	192
64	ST. CATHERINE	E 58	OUC	205	20	10.3	3	13	23	33	43	53	63	73	83	93	103	113	123	133	143	153	163	173	183	193
65	ST. CATHERINE	EC 53	OUC	125	20	6.3	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
66	ST. CATHERINE	NC 28	OUC	193	20	9.7	9	19	29	39	49	59	69	79	89	99	109	119	129	139	149	159	169	179	189	193
67	ST. CATHERINE	NC 35	RURAL	265	20	13.3	11	24	37	50	63	76	89	102	115	128	141	154	167	180	193	206	219	232	245	258
68	ST. CATHERINE	NC 47	RURAL	191	20	9.6	9	19	29	39	49	59	69	79	89	99	109	119	129	139	149	159	169	179	189	191
69	ST. CATHERINE	NW 55	RURAL	198	20	9.9	5	15	25	35	45	55	65	75	85	95	105	115	125	135	145	155	165	175	185	195
70	ST. CATHERINE	SC 23	OUC	189	20	9.5	4	14	24	34	44	54	64	74	84	94	104	114	124	134	144	154	164	174	184	189
71	ST. CATHERINE	SC 69	OUC	218	20	10.9	7	18	29	40	51	62	73	84	95	106	117	128	139	150	161	172	183	194	205	216
72	ST. CATHERINE	SW 75	OUC	246	20	12.3	2	14	26	38	50	62	74	86	98	110	122	134	146	158	170	182	194	206	218	230

Appendix 29: Supervisors' Reports

Supervisor's Report – NEPA Environmental Study

This report seeks to chronicle my involvement in the **National KAPB NEPA Environmental Study – 2015/2016**. When the supervisor was approached by Mr. Michael Kington to undertake this responsibility I was more than elated to serve in that capacity as my skill sets placed me in good stead to effectively execute this activity. My supervision started after we had the first meeting in Mandeville on October 1. 2015 and the subsequent selection of interviewers who were invited to a training sessions convened by in Ocho Rios, St. Ann. At the training, in one session, Mr. Andrew Pearson, a representative from the STATIN, took us through an exercise which outlined how the interviewers should canvass the EDS, how to select the respondents and the interpretation of the maps. This took place on October 13, 2015. After the training the supervisor met with the interviewers to ensure that they were clear on how to select the respondents as well as how to interpret the maps. The data were collected between October 14 and December 11, 2015.

General information

I had supervisory responsibility for the Western Region, which comprised of four parishes, namely, Trelawny, Westmoreland, Hanover and St. James. I had specific responsibilities for fourteen EDS. Please see the table below with the other pertinent information requested.

FIRST NAME	LAST NAME	EDS	QUESTIONNAIRES RECEIVED BY INTERVIEWER	QUESTIONNAIRES DISTRIBUTED	CONSENT FORMS DISTRIBUTED	CONSENT FORMS RECEIVED	OUTSTANDING	REMARKS
Lyndell	Samuels	C45	20	20	20	20	0	map received
		C2	20	20	20	20	0	
Lyndell	Samuels	W99	20	20	20	20	0	Difficulty locating particiants -due to work. The required number of participants was achieved well befoire the end of the route. This is undoubtedly due to the fact that the area became more populated after the 2011 census.
Stepani	Taylor	C3	20	20	6	20	0	Of the six consent forms received by the supervisor three are without telephone numbers. map received
Evans	Kamari	N3	20	20	20	20	0	Of the 20 consent forms received 15 are without telephone numbers. map received
Evans	Kamari	N9	20	20	20		0	Of the 20 consent forms received 4 are without telephone numbers. map received
Evans	Kamari	S19	20	20	20	19	0	Of 19 consent form collected 7 are without telephone numbers. map received
Glenn	Lileth	WH15	20	20	20	18	0	Map received
samuels	lyndell	ED99	20	20	20	20	0	3 maps received
Glenn	Lilleth	ED57	20	20	20	20		Map received
Green	Marcia	N103	20	20	20	20		Map received
James	Rose-Marie	S22	20	20	20	20		Map received
James	Rose-Marie	WC57	20	19	20	19	0	Map Received
Glenn	Lilleth	WH77	20	19	20	19	0	Map Received
	Total		**280**	**278**	**266**	**255**	**0**	

Supervision

I was able to provide guidance to the six-member team through:

1. Constant telephone contacts
2. Assistance in identifying EDs/ED boundaries
3. Spot checks in EDs

Phone calls were also made, by the writer, to selected persons in the study to verify their involvement in the survey.

Technical support was also received from Mr. Andrew Pearson from STATIN to assist some of the interviewers in identifying ED boundaries and in selecting the respondents for the study.

Conclusion

Although the Western Region had a response rate of 99% this was not achieve without it challenges since some of the interviewers had to revisit quite a few of the dwellings more than one time to locate the respondents because they were at work or otherwise engaged when they visited the first time. It was observed that, generally, the population/number of households in the EDs has increased significantly since the 2011 population census.

Prepared by: Gerald Miller (Supervisor)

April 13, 2016

Report of Field Activity for a National KAPB Environment Study

Conducted between the period October 14th 2015 to December 11, 2015

On behalf of the National Environment and Planning Agency (NEPA)

In 2015 I was asked to participate in a National KAPB Environment Study that was conducted by NEPA. The first training session in preparation of the assignment was held in Mandeville on October 1, 2015 where the selected Supervisors were apprised of the roles, responsibilities and expectations as well as background to the Survey to be conducted. Interviewers were selected based on their positions as field workers in the communities in the various parishes. On October 13th 2015, Interviewers were introduced to the survey instrument and trained to administer same. Please note that one of the selected Interviewers did not attend the training and as a result could not participate in the field activities hence those trained were asked to take on additional load and the Supervisor had to carry out some of the field activities to allow for adequate coverage in the administration of the instrument.

Supervision was provided for the South East region, which comprised the parishes of Kingston, St Andrew, St Catherine and St Thomas. In Kingston 6, Enumeration Districts (EDs) were selected, 18 EDs in St Andrew, 2 EDs in St Thomas and 14 EDs in St Catherine.

The assignment of EDs is outlined in the table below:

Name of Interviewer	**# EDs Assigned**	**# EDS Completed**	**Comments**
Olive Scott	4 +1	5	
Zoe Wellington	4 + 1	5	
Marcia Watson	4	4	
Tanya Brown	4 + 2	1	Upsurge of violence in EDs
Andre` Walcott	4 + 2	0	Change in workload and schedule.
Sophia Howard	4	0	Only 1 questionnaire was administered. Suffered tragedy in family
Carlene Anderson Douglas	2		St Thomas had only 2 EDs
JoAnne Williams	4	1 ½	Medical issues
Dawn Walters	4	4	
TOTAL EDs	**40**		

Several challenges were encountered the field:

- Volatility in some EDs in Kingston and St Andrew and Interviewers reported that they were advised by the Gatekeepers not to return to the community.
- One interviewer suffered tragedy within the family and was devastated by the incident and because of the emotional impact was unable to carry out the exercise. Unfortunately, when the Interviewer was contacted upon receipt of the information related to the incident she indicated that she wanted to continue the exercise and continued to give this assurance during periodic follow up. However, she did not follow through as promised.
- One interviewer in St Catherine developed allergic reactions from exposure to allergens while on the field and had to seek medical care. This impacted the timely completion and as such not all the EDs assigned were polled.
- One interviewer did not administer any questionnaire and only cited his challenges at the deadline for return of the instruments.

- In some communities several revisit had to be made because interviewers were asked to return or participants were not at home on initial visits and rainfall slowed progress.
- Some persons were reluctant to sign the consent forms while others did not wish to participate.

It was difficult to do many spot checks on the field because the Supervisor had to participate in the administration of the survey instrument. However, interviewees were selected at random from each ED that was polled and telephone contact made to verify field activities. In addition, Interviewers were contacted to ascertain progress and calls were made to me for clarification and directives when challenges were encountered.

In conclusion, it was a very useful exercise and I am grateful for the opportunity that was provided to share in this data gathering. The time that was made available for administration of the questionnaires however was too short.

Prepared by
Dawn Walters: Supervisor
April 15, 2016

Supervisor's Report – NEPA Environmental Study

This report explains my involvement in the NEPA National KAPB Environmental Study – 2015/2016. My supervision started after we had the first meeting in Mandeville on October 1. 2015 and the subsequent selection of interviewers who were invited to a training sessions convened by Mr. Michael Kington (Consultant) in Ocho Rios, St. Ann. This took place on October 13, 2015. After the training the supervisor met with the interviewers to ensure that they were clear on how to select the respondents as well as how to interpret the maps and to identify the divisions (EDs). I supervised the entire data collection process in my Region. This took place from October 14 to December 11, 2015.

General information

I had supervisory responsibility for the Southern Region, which comprised three parishes, namely, Clarendon, Manchester and ST Elizabeth; I had specific responsibilities for fourteen EDs.

Please see the table below with the other pertinent information requested.

No.	Parish	ED	Name	Map - Y/N	Consent Form	# Quest Admin.	ED Map
48	St. Elizabeth	NE 77	J. Hamilton	Y	19	20	1
49	St. Elizabeth	NW 64	J Miller	N	19	20	
50	St. Elizabeth	SE 8	M. Hamilton	Y	20	20	1
51	Manchester	C 79	J. Hamilton	Y	19	20	1
52	Manchester	NW 85	J. Hamilton -	Y	20	20	1
53	Manchester	S 49	Monique Hamilton	Y	20	20	1
54	Clarendon	N 63	J. Hamilton	Y	20	20	1
55	Clarendon	SE 45	Monique Hamilton	Y	20	20	1
56	Clarendon	SE 53	J. Hamilton	Y	20	20	1
57	Clarendon	SE 72	M. Hamilton	Y	20	20	1
58	Clarendon	SW 35	J. Hamilton	Y	20	**20**	1

Supervision

The supervisor provided guidance to the three-member team through telephone contacts, targeted meetings and spot checks. Phone calls were made to selected persons in the study to verify their involvement in the survey.

Conclusion

The Southern Region had a response rate of 100%. This was not achieved without its challenges since some of the interviewers had to revisit quite a few of the dwellings more than one time to administer the questionnaires. This happened because respondents were not at home, or some were too busy when they (the interviewer) visited the first time, and even the second time in a few instances. It was a worthwhile and rewarding exercise as valuable information was collected and the writer learned important lessons in the process.

Report Prepared by: Diana Johnson (Supervisor)

April 17, 2015

National Knowledge, Attitude, Practice and Behaviour (KAPB) National Environment Study (NEPA) Study 2015/2016

Supervisor's Report

Introduction

This reports seeks to outline the role and activities undertaken by Supervisor Damion Scott in the ***National KAPB NEPA Environmental Study – 2015/2016***. I was Approached by Mr. Michael Kington to participate in the study, as a Supervisor for the parishes St. Ann, St. Mary and Portland, I was more than delighted to do so as I believed I had the relevant skill set and could gather a team to achieve the objectives of the study as outlined by Mr. Kington on October 1st, 2015 at the Supervisor's Meeting at the Mandeville Primary and Junior High. Interviewers were recruited to administer the questionnaires in the aforementioned parishes and attended a training session at the Ocho Rios Baptist Church Conference Room on October 13th, 2015. One of the training sessions was conducted by Mr. Andrew Pearson, representative from Statistical Institute of Jamaica (STATIN), who took the interviewers through canvassing the Enumeration Districts (EDS) selected, the selection of respondents and interpretations of the maps provided by the study. Subsequently, I met with the interviewers and assigned the map as well as to set timelines for the completion and return of questionnaires. The data collection period was October 14-December 11, 2015.

General Information

I had supervisory responsibility for the three (3) parishes, eight (8) electoral divisions and four (4) interviewers:

- St. Ann (EDs NE77,SE63 and SE71)
- St. Mary (EDs C53 and C75)
- *Portland (EDs E108, E23 and W45)*

Table1: shows a summary of the Enumeration Districts and the questionnaires administered.

First Name	Last Name	Parish	Electoral Division (ED)	Questionaires distributed by Supervisor	Questionaires Administered by Interviewers	Consent form signed	Remarks
Tiffany	Ferguson	St. Ann	NE 77	20	19	19	Interviewer revisted repondents to get consent form signed and participant refused. No maps were returned.
			SE63	20	18	18	
			SE71	20	18	18	
Candice	Lyttle	Portland	W45	20	0	0	Mrs. Marriot-Grant and Ms. Lyttle combined there efforts to cover th parish of Portland. No questionnaires was done for W45 as during the period a rapist was said to be plaguing the communities in that ED.
Yvette	Marriot-Grant	Portland	E108	20	20	20	Two of the three maps issued were returned
			E23	20	7	7	
Marc-Oneil	Thomas	St. Mary	C53	20	10	10	The parish of St. Mary was impacted by rain over the data collection period and since an extentsion was not obtain the response rate is indeed low.
			C73	20	9	9	The two maps issued were returned
			Total	**160**	101	101	

Supervision

The foundation for supervision of the interviewers was laid by the presentation done by Mr. Pearson. However, clarification was made with interviewers via telephone and at my office when there was a need. On occasions, checks were also made with interviewers on the field. From the onset, interviewers were asked to as best as possible secure consent from respondents and a contact number for verification. Verification of respondents was done via telephone on a one (1) in five (5) basis, that is for every five (5) questionnaires collected one respondent was randomly selected and called. This method had it limitations as not all the respondents called answered and not all the numbers given were correct.

Challenges:

- The inclement weather posed a significant challenge for the data collection period in St. Mary and delayed the interviewer completion of administering the questionnaires.
- The recommended three revisits to selected households did not prove beneficial as eligible responders were often at work and on weekends were too busy to facilitate the administration of the questionnaires.
- Interviewers reported a trust deficit as it relates to respondents willingness to sign the consent form

Conclusion

One hundred and one (101) questionnaires were administered in the parishes of St. Ann, St. Mary and Portland, this represent a response rate of sixty-three percent (63%).

Thank you to the team members.

Report Prepared by: Damion Scott
Supervisor

Date: April 17, 2016