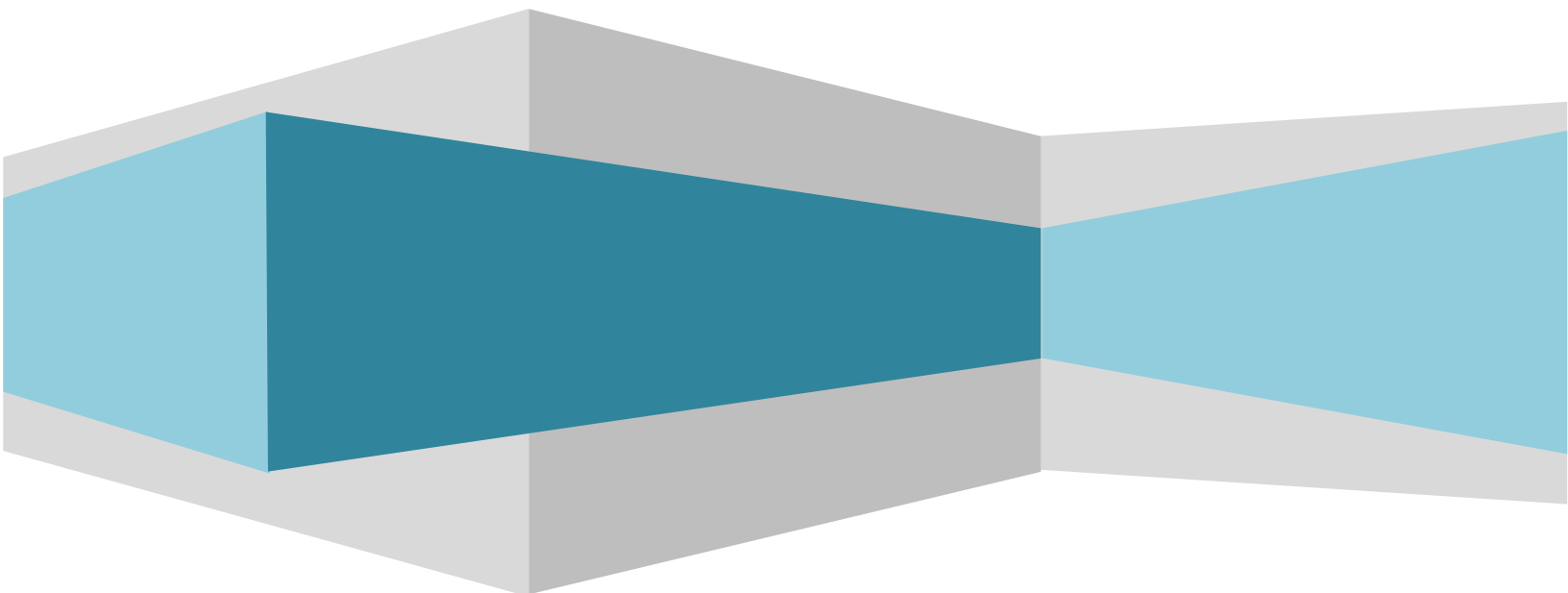


**INTEGRATING WATER, LAND AND ECOSYSTEMS MANAGEMENT IN  
CARIBBEAN SMALL ISLAND DEVELOPING STATES (IWECS)**

**NATIONAL SUB-PROJECT 1.4  
BIODIVERSITY MAINSTREAMING IN COASTAL LANDSCAPES  
WITHIN THE NEGRIL ENVIRONMENTAL PROTECTION AREA OF  
JAMAICA**

**KNOWLEDGE, ATTITUDES, PRACTICES AND BEHAVIOUR STUDY  
FOR THE NEGRIL GREAT MORASS  
- Final Report**

PREPARED BY: HOPE CARIBBEAN CO. LTD  
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## Report on KAPB Study for the Negril Great Morass

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### List of Acronyms

ED	Enumeration Districts
EPP	Environmental Protection Plan
GOJ	Government of Jamaica
HEART	Human Employment and Resource Training
IWEco	Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States
JTB	Jamaica Tourist Board
KAPB	Knowledge, Attitudes, Practices and Behaviour
MICAF	Ministry of Industry, Commerce, Agriculture and Fisheries
NCTVET	National Council on Technical and Vocational Educational and Training
NEPA	National Environment and Planning Agency
NEPT	Negril Area Environmental Protection Trust
Negril EPA	Negril Environmental Protection Area
NIGALPA	Negril Green Island Area Local Planning Authority
NRCA	National Resources Conservation Authority
NWC	National Water Commission
PES	Payment for Ecosystem Services
PSU	Primary Sampling Unit
RADA	Rural Agricultural Development Authority
STATIN	Statistical Institute of Jamaica
TEEB	The Economics of Ecosystems and Biodiversity
WMA	Watershed Management Area
WRA	Water Resources Authority

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## Executive Summary

In general, residents, farmers and business owners in the Negril EPA displayed high awareness and understanding of the environment, wetlands and The Negril Great Morass. Overall respondents were able to correctly identify elements of nature associated with environment. There was also correct association with mangroves and swamp and high prompted awareness of The Great Morass. While there was majority awareness of The Negril Great Morass, less than a half were aware of the Negril Environmental Protection Area and that The Negril Great Morass was a protected area.

Prompted recall of wetlands and The Negril Great Morass increased with age group; specifically, older respondents were more likely to be aware of The Negril Great Morass than their younger cohorts. This could possibly indicate that the older aged population have a greater connection with the environment through cultural and traditional norms which have not been necessarily passed down to the younger population. Again, this was evident in awareness of The Negril Great Morass being a protected area, where the younger aged cohort were less aware. The older cohort was also more likely to be aware that they lived and worked in The Negril Environmental Protection Area.

Overall, the older age cohort were significantly more likely to endorse that it “is my personal responsibility to protect the wetland” and “my actions have an impact on the wetland” than the younger age cohort. Likewise, farmers and business owners were more likely to endorse that “protecting the environment influences the amount of money the country earns (income generation)” than residents and employees. This suggests that those who have a greater connection with and appreciation for the environment, particularly the older age cohort, farmers and business owners, would be more likely to act as environmental stewards and agents of change.



## **KNOWLEDGE AND AWARENESS**

### **Environment and Wetland Areas**

The majority of respondents were able to correctly identify elements of the environment. Responses included water, trees, air, animals and the sea as well as people. When environmental elements were probed, specifically wetlands, mangrove and swamp, at least 4 in 10 respondents associated the correct or appropriate words. The criteria for correct word associations were determined by the use of keywords from the definition of environmental elements and the reference to plants or trees in water. Most respondents (71.7%) were able to identify appropriate words related to wetlands, including the top responses of swamp (31.4%) and morass (31.1%). The majority (82.5%) were also able to associate the appropriate words with a swamp. The top responses included morass (23%), a large place where water is settled (20.4%) and wetlands (19.3%). Additionally, just under a half (43.1%) identified correct words they would associate with mangroves, including wetlands (14.6%) and morass (13%). This would suggest that knowledge of environmental elements unique to The Negril EPA was high among respondents.

Interestingly, although respondents were able to correctly identify words associated with elements unique to The Negril Great Morass, unprompted recall (11%) was significantly lower than prompted recall (68%). The disparity between 4 in 10 respondents being able to correctly identify words associated with wetlands, mangrove and swamp when prompted and 1 in 10 having unprompted recall of The Negril Great Morass, is cause for concern. This disconnect should be stemmed to ensure that knowledge of environmental terminologies is translated into high awareness of a defining environmental feature of the area.

Nevertheless, older cohorts and males had higher recall of the wetlands and The Negril Great Morass than their female counterparts. The same was true for awareness of The Negril Environment Protection Area and The Negril Great Morass as a protected area. The older age cohort was more likely to indicate awareness of residing and working in The Negril EPA. On the other hand, it was females and residents of Westmoreland who placed significantly higher importance on the environment to community development.

The majority had an understanding of environmental management as 47% understood the term to mean protecting and preserving natural things. Additional explanations offered were keeping the environment clean (19%) and taking care of the environment (16%). It is increasingly evident that pockets of awareness and knowledge exist as the majority were aware of the ecosystem functions wetlands provided. Those functions related to the provision of food, scenery, protection from flooding, and prevention of global warming were rated highest.

### **Conservation**

At least 7 in 10 were knowledgeable of practices which could protect The Negril Great Morass and The Negril EPA. These included beach clean-ups (84.6%), planting trees, whether fruit, palms or mangroves (71.7%) and proper waste disposal (73.4%).

### **Threats to the Environment**

Improper waste and garbage disposal including garbage getting in the water (75.7%), dumping up of mangroves (64.6%) and water pollution from businesses including hotels and villas (61.9%) were the most cited threats to the wetlands. The most cited problems faced as it related to respondents and the environment were in relation to water and the supply of water. These included drought (39.4%), not enough water for farming (36.4%), less fish being caught (35.6%), poor quality of water (34.3%) and beach erosion or loss of beach front (31.7%). This suggests that the lack of and poor quality of water were the most prominent concerns in relation to the wetlands, land and environment. Flooding was not perceived as a threat to the environment; in fact many (40.9%) believed flooding was not a danger, while 36.9% were of the impression that there was little danger. In contrast, storms and hurricanes were identified as threats with 43.1% identifying that the community was in severe danger from storms/hurricanes.

A third of respondents noted that issues related to water occurred in the last 12 months. These issues were beach erosion/loss of beach fronts (31.7%) and less fish being caught (37.9%). Notably, dumping of the wetlands was also an issue identified, with 22.9% citing it as having

occurred in the past 12 months, 29.7% endorsing it as a most/somewhat severe problem and 22.9% endorsing it as the most severe problem.

### **ATTITUDE TOWARDS THE ENVIRONMENT, WETLANDS, NEGRIL EPA AND ENVIRONMENTAL STEWARDSHIP**

Almost a half (49%) indicated that they were extremely or quite concerned or worried about nature or the natural surroundings of the community. Interestingly, concern was highest amongst those 45-54y (40%, extremely concerned) and males (35%, extremely concerned). Top reasons proposed were “we have to take care of our surroundings/if we destroy nature we destroy ourselves” (17.6%), “I have a lot of love for the environment” (8.7%) and “clean environment provides fresh air/ surroundings need to be kept clean” (6.6%). This would suggest that there existed some acknowledgement of the individual’s role in protecting and preserving the environment.

Further to this, support for the environment was evident with almost three quarters of respondents (72%) endorsing “*the balance of nature is very delicate and easily upset*” (strongly agree/agree) and “*humans are severely abusing the environment*” (strongly agree/agree.) Additionally, more than three quarter of respondents (79.5%) supported the view that “*Humans do NOT have the right to damage the environment just to get greater economic growth*”. A similar proportion (79.9%) endorsed the view that “*In order to protect the environment we need economic growth*”. This would suggest that there should be a harmonious balance between economic success and environmental protection, as economic success is important and necessary to achieve environmental protection, however economic success no matter what the environmental cost, is not supported.

The support of the environment continued to resonate as the majority (53.3%) endorsed at least three of the following statements:

- “*Humans do NOT have the right to damage the environment just to get greater economic growth*” (strongly agree/agree),
- “*Protecting the environment is more important than protecting economic growth*” (strongly agree/agree),

- *“I oppose any removal of natural areas no matter how economically beneficial their development may be” (strongly agree/agree) and*
- *“Humans are no more important in nature than other living things” (strongly agree/agree).*

This pro-environmental attitude was evident in the majority (76%) indicating that the wetlands were very/somewhat important. Males (82%) were more likely to emphasize the importance of the wetlands as being very/somewhat important than their female (72%) counterparts.

When probed, degrading (damaging) wetlands was identified by the majority as leading to the loss of important wild plants and wild animals (90%) and reducing how much income persons can make from farming or fishing tourism (85.6%). The recognised value of wetlands was further evident in the vast majority who identified wetlands as extremely important/important for the following:

- *“Is important for maintaining the fish stock of the area” (92.5%)*
- *“Allowing wild animals to feed and reproduce in a protected and safe area so they can increase in numbers” (91.6%)*
- *“Provide a home for and support the survival of the unique wild plants and wild animals of the area” (91.2%)*
- *“Important for variety of wild animals and wild plants in the area” (90.9%)*
- *“The roots of mangroves hold soil firmly to prevent erosion by waves and high tides” (90%).*

Information is needed on how to appropriately protect The Negril Great Morass. While the vast majority (95%) indicated that it was necessary to have information on how to protect The Negril Great Morass, it was less than two-thirds (64%) who felt they actually had enough information. Acknowledgment of personal responsibility for the environment was evident in the 4 in 10 persons (40%) who indicated that they could have an extremely or quite large effect on protecting the environment. At least 6 in 10 respondents strongly agree or agree with all 10 statements relating to the impact that the state of the environment and wetlands had on life, quality of water, economic development and income generation.

Farmers and business owners were more likely to endorse that “protecting the environment influences the amount of money the country earns (income generation)” than residents and employees. While the older age cohort was more likely to endorse that it “is my personal responsibility to protect the wetland” and “my actions have an impact on the wetland” than the younger age cohort.

## **PRACTICES**

Overall, most respondents (84.1%) reported having engaged in at least one environmentally protective practice at least once in their life. Most (76.7%) were also currently engaged in at least one such practice. Thus, there was some current engagement in common environmental protection practices such as proper waste disposal (chemical, solid waste and garbage) (46.1%) and proper household waste disposal (57.6%).

While these activities ultimately protect the environment, they are also what constitute basic hygiene practices. Thus, participation in them is likely to be motivated more by a desire for clean personal surroundings than concern for the environment as an issue. Current engagement in environment protection activities such as tree planting (33.6%) and public clean up days (19%) was notably lower. Additionally, it was very few respondents (7%) who reported having participated in environmental workshops.

While participation in environmental training and workshops was relatively low, most respondents were involved in some community based organization. Specifically, 65% of the respondents stated that they were involved in a community based organization. These could be used as a catalyst to increase environmental education.

## Chapter 1 Introduction

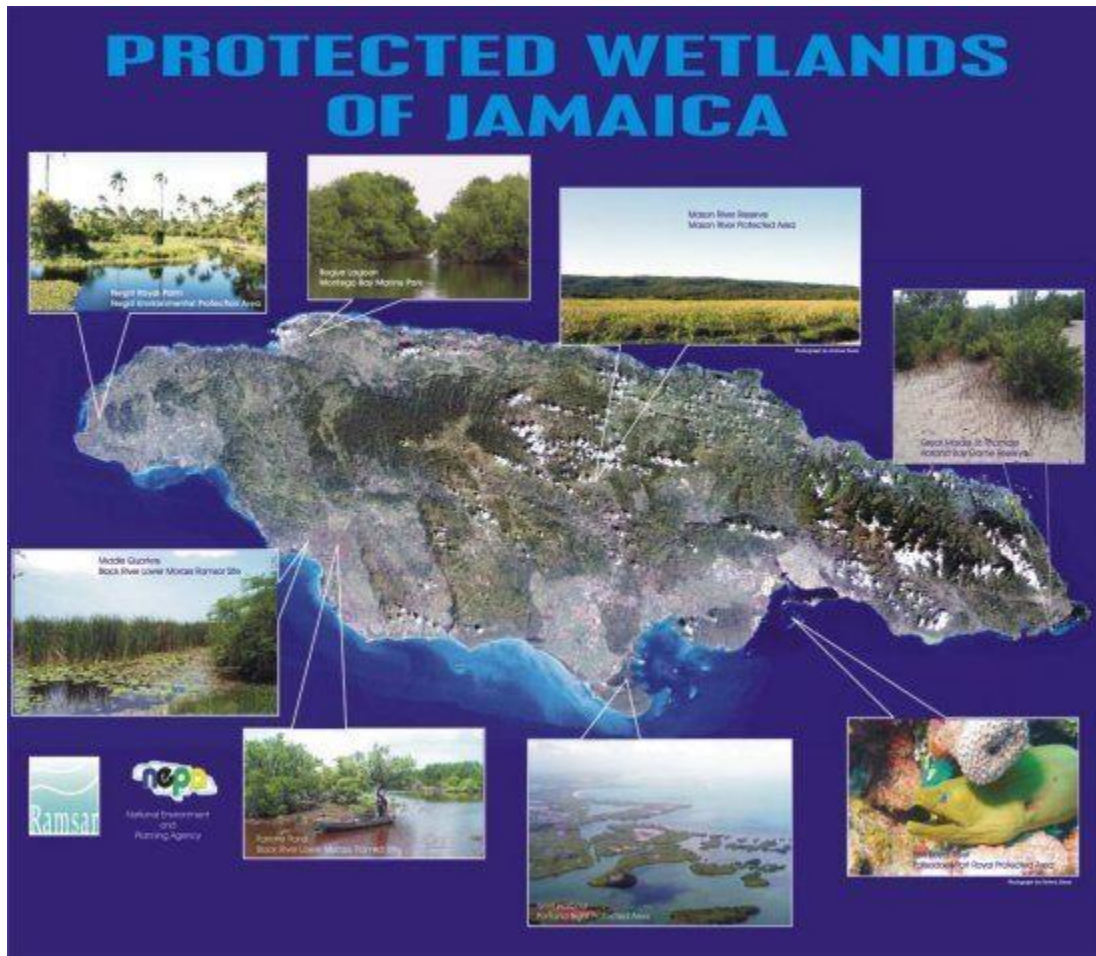
Jamaica consists of 10 hydrological basins and 26 watersheds (each usually identified by the name of the major river which runs through it) (National Water Commission, 2017). These basins contain over 100 streams and rivers in addition to subterranean waterways, ponds, springs and blue holes. Present supply of water is 84% by volume from aquifers and 16% from surface water. Jamaica's water resources reserves are 90% groundwater and these are mainly in alluvium aquifers. The island is dependent on these water sources for domestic, agricultural and industrial purposes. (US Army Corps and Engineers, Water Resources Assessment of Jamaica, February 2001).

Wetlands are defined as areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with static water, flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six metres (The Ramsar Convention, 1971). Wetlands can belong to one of the three broad categories: Inland Wetlands, Marine/ Coastal Wetlands and Human Made Wetlands. Due to their diversity, Wetlands can be further subdivided and classified based on hydro-geomorphology and/or their vegetation characteristics. As such, wetlands can be defined as Marine (coastal lagoons, rocky shores and coral reefs), Estuarine (mangroves, deltas and marshes), Lacustrine (wetlands associated with lakes), Riverine (wetlands along rivers and streams) and Palustrine (marshes, swamps and bogs) (Ramsar Convention Secretariat, 2011).

These wetlands provide stability to the shoreline and in turn the ecosystem by providing: coastal protection, erosion control, flood protection, water supply and purification, carbon sequestration, climate regulation, raw materials and food, hunting and gaming activities, tourism and recreation, education and research as well as cultural and bequest/historical values (The Value of Estuarine and Coastal Ecosystem Services, 2011). The largest wetlands in Jamaica are The Negril Great Morass in Hanover/Westmoreland, The Great Morass in St. Thomas and Black River Upper and Lower Morass in St. Elizabeth. In Jamaica, the majority of wetlands are found



primarily on the south coast, in low lying areas and take the forms of coastal mangroves, marshes/morasses, lakes and ponds.



**Figure i: Protected Wetlands of Jamaica**

Source: World Wetland Day 2017, National Environment Planning Agency

Mangroves are tropical and sub-tropical plants that grow in coastal intertidal zones. They usually consist of low oxygen areas with slow moving waters, often facilitating sediment accumulation (Forces of Nature, 2019). These aquatic bodies act as a transition zone between nautical and earthly environs, strengthening the coastal resilience. This is accomplished through several processes including sediment accumulation, water purification, release of key nutrients to maintain balance in the ecosystem, nursery ground and habitat for species, shelter for aquatic creatures during storms and hurricanes and source of consumable resources such as food and timber.

Mangroves are a critical marine system that not only provides a shelter for the diverse groups of species that occupy these areas, but also protects the shoreline from coastal floods and erosion and helps mitigate the harmful impacts. Jamaica has a high flood risk from coastal storms; however, this is significantly reduced by the presence of mangroves. According to Forces of Nature (2019), a report prepared by The World Bank, the annual value of Jamaica's mangrove forests for flood risk reduction to the nation's built capital is more than US\$2,500 per hectare per year. Over 170,000 people who reside in coastal communities are also protected by mangrove forests against the effects of deadly storms. Furthermore, it protects approximately 50% or US\$2.4 billion of the total population and built capital. This proves that the benefits of mangroves are not only environmental but also economical. The study further reveals that Jamaica's mangroves provide approximately US \$32.7 million in protection to its heavily settled coastline areas, giving the island added protection against the increasing effects of climate change. Despite these benefits, the mangroves are being threatened by various factors. The greatest risk to the mangroves include human activities, such as extraction for timber, small-scale fishing, farming and pollution, developmental efforts and environmental shifts such as climate change. Limited data presents that over the past two decades (1996-2016), there has been over 770 hectares of mangrove lost. Restoration is, however, a possibility and should be explored to reinforce the coastline's first line of defense.

**The Negril Environmental Protection Area (The Negril EPA)** The Negril EPA is located at the western end of Jamaica in the parishes of Westmoreland and Hanover and encompasses 406.7km<sup>2</sup> of coastal and marine ecosystems and is 6% of Jamaica's coastline. It consists of The Negril Great Morass, Coastal and Marine Areas and Green Island Areas. The Negril EPA houses The Negril Great Morass, The Royal Palm Reserve, the Fish River and Negril Hills. Due to its great significance and its ability to encourage sustainable development for the area, The Negril EPA was declared a Protected Area by the Jamaican government, in 1997. According to Environmental



Impact Assessment (2014), Environmental activities within The Negril EPA were guided by an



Environmental Protection Plan (EPP), spearheaded by The Negril Area Environmental Protection Trust (NEPT) which works alongside other government agencies such as The National Resources Conservation Authority (NRCA), National Environment Planning Agency (NEPA) and the Negril Green Island Area Local Planning Authority (NGIALPA).

**Figure ii: Negril Environmental Protection Area**

Source: Environmental Foundation of Jamaica

### The Negril Great Morass Wetlands

The Negril Great Morass is a fundamental part of **The Negril Environmental Protection Area (The Negril EPA)**, and is one of the largest natural coastland ecosystems in the Caribbean, supporting internationally significant species and high species endemism. The Negril Great Morass is Jamaica's second largest fresh water wetland, bordered by the Fish River Hills to the east, the Negril Hills to the south, and a narrow beach strip (Long Bay) and the Caribbean Sea to the west (See Appendix 3).

The 28.3km<sup>2</sup> (7,000 acre) Great Morass is a peat accumulating wetland which accounts for approximately one fifth of all wetland areas in Jamaica, and stretches 16km from the South Negril River to Orange Bay in Westmoreland. Spanning at 3km wide, it serves as a refuge for many species of flora and fauna.

Wetlands, such as The Negril Great Morass, play an integral role in the ecology of watershed. The combination of shallow water, high levels of nutrients and primary productivity is ideal for the development of organisms that form the base of the food web and feed many species of fish, amphibians, shellfish and insects. Many species of birds and mammals rely on wetlands for food, water and shelter, especially during migration and breeding. With this being said, the morass is critical to the Negril environment as it filters the water flowing down from the interior of the parish and is a conduit for fresh water to the area.

Major habitats found within the morass are open water, marsh, mud flats, mangroves, terrestrial forests and swamp forests. The open water habitat is home to fishes such as Tarpon (*Megalops atlantica*), Ticki ticki (*Gambusia spp.*), African Perch (*Tilapia spp.*), Snook (*Centropomus spp.*) and other species such as the Jamaican Slider Turtle and Eel (*Anguilla rostrate*). Land crabs (Crustacea), Mollusks (*Mollusca*) and worms inhabit the mud flats.

Within the Morass lies 3 species of swamp forestry. **The Royal Palm Reserve** spans 1.62km<sup>2</sup> and houses the largest swamp forest of the first species, the endemic **Royal Palm**. These trees serve as habitats for native birds such as doves, hummingbirds, Jamaican woodpecker (*Melanerpes radiolatus*) and the White Crowned Pigeon (*Petagoienas leucocephala*). The second species is the endemic **Bull Thatch Palm**, which are usually found centrally in the morass, in areas where the peat is shallow and well drained. The third species are **Mangroves**. Red Mangrove (*Rhizophora mangle*), Black Mangrove (*Avicennia germinans*), White Mangrove (*Laguncularia racemose*) and the Button Mangrove (*Conocarpus erectus*) are the four mangrove types present within the morass and are primarily found on its eastern end. The red mangrove can also be found along the banks of the South and North Negril rivers.

## **Negril Economic Overview:**

### **Tourism:**

Negril is among the largest tourist resort areas in the island, alongside Ocho Rios and Montego Bay. The tourism sector is the main contributor to the economic and environmental structure of Negril. Its high number of attractions cater to global visitors. The tourism sector in Jamaica is a major contributor to the economy, with direct contribution of Travel & Tourism to Gross Domestic Product (GDP) JMD109.3bn (7.7% of total GDP) in 2013 (World Travel and Tourism Council, 2014). As a result of tourism, over 9000 job opportunities were created (Jamaica Tourist Board, 2014). Other regions that also benefited from this development include Ocho Rios (24%), Kingston, Port Antonio and South coast which counted for a combined 12%. Tourism has also led to an increase in small commercial businesses such as craft vendors, bars and restaurants. According to JTB Annual Travel Statistics Report (2014), the resort area of Negril recorded an average hotel room occupancy rate of 63.5% in comparison to the rate of 64.5% in 2013. The number of stopovers that intended to stay in hotel accommodations declined from 361,647 in 2013 to 356,731, a decrease of 1.4% in 2014 (JTB, 2014).

### **Agriculture:**

Another main source of income for those residing in the project boundary was agriculture. According to the Ministry of Agriculture and Fisheries (*now the Ministry of Industry, Commerce, Agriculture and Fisheries(MICAF)*), there are four hundred (400) registered fishermen with approximately one hundred and twenty (120) registered vessels operating within the Negril area (Ministry of Agriculture and Fisheries, 2006). There has been an evident decrease in fishing activities over the past twenty years; despite this, it remains a vital source of income. Farming is the other major use of natural resources which is the predominant land use within the Morass (Negril Environmental Protection Trust [NEPT], 2012). Within the interior sections as well as on the fringe, cash crops are mainly cultivated at an artisanal level. These crops include but are not limited to: sweet potato, lettuce, cabbage, callaloo etc. According to NEPT (2012), along the eastern fringe and bank of the South Negril River, banana and sugar cane cultivation was

prominent. In the community of Sheffield and Negril Spot areas, cattle farming also existed on a small scale.

***Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco), National Sub-Project Biodiversity Mainstreaming in Coastal Landscapes with the Negril Environmental Protection Area in Jamaica project Background:***

Given the area's importance, management of the wetland is important in maintaining the water resource and biodiversity of Jamaica. The Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco Project) is financed by the Global Environment Facility through the United Nations Environment Programme. IWEco Project is a five year project that aims to build on the work of previous initiatives to address water, land and biodiversity management as well as climate change. The IWEco Project aims to contribute to the preservation of Caribbean ecosystems that are of global significance, with Jamaican wetlands such as the Negril Great Morass, being one of such ecosystems.

This study was conducted in fulfillment of the KAPB requirement.

**PROJECT OBJECTIVES:**

- **The objectives of this study were:**
  - i. To provide data on the current knowledge, attitudes, practices and behaviour of **residents** towards the environment and services provided by the environment.
  - ii. To provide data on the current knowledge, attitudes, practices and behaviour of **private sector stakeholders owning lands or operating businesses within the project site** towards the environment and services provided by the environment.
  - iii. To provide baseline data relevant for programming follow-up activities, monitoring and evaluating progress during the total project year.
  - iv. To provide context for further studies and research in this area.

## Chapter 2 Situation Analysis



Despite its incontestable importance, the wetland finds itself under considerable threat and pressure from activities that overexploit the ecosystem's services, leading to degradation of the wetland and its vegetation. This has been attributed to natural and anthropogenic hazards.

**Figure iii: Boats along the banks of the Great Morass**

Source: Hope Caribbean Co. Ltd, 2020

Threats to the area include:

1. Environmental threats:

- Invasive Alien Species namely the Wild Ginger (*Alpinia allughas*), which has invaded the area and has effectively suppressed the regeneration of native flora
- Frequent brush fires which threaten the tourism industry and human health
- Peat subsidence
- Climate change
- General Vulnerability to Natural hazards e.g. hurricane, flooding, landslide, soil erosion, etc.
- Sedimentation
- Aquatic nutrient enrichment

2. Anthropogenic threats:

- Coastal development and an increase in tourism in the Negril Area
- Felling of Trees
- Illicit cultivation and unsustainable agricultural practices
- Human-induced drainage of the wetland for land reclamation (draining and filling of land for recreation and agricultural use)
- Informal Settlements
- Pollution –Garbage and Industrial Waste
- Fires which threaten the tourism industry and human health
- Canalization of the main rivers which lead to a reduction in the quality of the freshwater flowing to the Morass from the neighbouring springs
- Reduced flood control from activities such as canalization and dumping up of the wetland

3. National /Institutional barriers such as:

- Deficits in national policy as well as local institutional and regulatory frameworks
- The fragmented approach to addressing threats to biodiversity, which leaves critical habitats at higher risk of degradation.
- Nescience in relation to sustainable Ecosystem management and provision.
- Stakeholder engagement and support/ Lacking stakeholder investments
- Limited financial resources

- Outdated legislation
- Inadequate enforcement of the laws governing wetland protection

The Negril EPA area possesses two main economic sectors: tourism and agriculture. These industries rely heavily on the natural ecosystem and its biodiversity, thus investment in biodiversity conservation is extremely important. Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco), National Sub-Project Biodiversity Mainstreaming in Coastal Landscapes with the Negril Environmental Protection Area in Jamaica project will aim to build on national efforts by:

- a. Addressing environmental concerns facing the protected area.
- b. Promoting biodiversity conservation by the daily operators of ‘biodiversity – dependent’ production sectors in Negril.
- c. Promoting biodiversity conservation into land use planning.

The ability of the project to achieve its broad goals is contingent on its ability to implement the planned environmental interventions. Success of the overall project is also dependent on the project’s ability to effect positive social changes in stakeholders’ behaviour towards the environment and the long-term adoption of best practices for environmental stewardship.

In order to achieve the primary goal of the project, it is important to understand the situation and circumstances of the people who work, live and do business in the Negril EPA. From the focus group and in-depth interviews conducted, there were differences in knowledge and awareness of the environment between the younger and older participants. Younger participants did not readily identify the environment as natural surroundings, but alluded to the people and the circumstances and issues that affect them and their livelihoods.

Unemployment, water shortages and the prevalence of criminal activities were the main issues highlighted.

## Chapter 3 Methodology

This project utilized a mixture of qualitative and quantitative methods in the primary research stage as well as secondary research to inform its design where necessary. The data collection process started in June and ended with the qualitative phase in early August. The questionnaire was pre-tested in March. In response to Jamaica's first case of COVID-19 and The World Health Organization's stipulation for Government bodies worldwide to implement mitigation and prevention measures, a number of changes to social activities were experienced. Social distancing, limited movements, curfews, wearing of masks, lockdown of specific communities and parishes as well as restrictions on public gathering impacted the data collection process. As such there were unforeseen delays which lengthened the project.

### Qualitative Phase:

In order to understand attitudes towards the environment, conservation and environmental stewardship, the qualitative methods of in-depth interviews and focus group discussions were employed during the course of the project. This phase sought to identify attitudes towards the environment including its definition, importance, conservation and related practices. The awareness of wetland area as a specific environment, its importance and vulnerabilities were also explored.

Discussions and interviews were held with tourism entities and other business owners, farmers and residents. Specifically, one (1) focus group discussion with five (5) male and five (5) female youths aged 15-24y who reside in The Negril EPA was conducted. Additionally, nine (9) in-depth interviews with farmers and business owners who operate businesses in The Negril EPA were conducted.

**A focus group** is typically a gathering of 8-10 persons who are unfamiliar with each other but have some common interest or characteristic. This methodology capitalized on group dynamics by allowing for interaction of participants that will generally stimulate richer responses and allow new and valuable thoughts to emerge. It is this interaction between different types of people, in their various roles, which brought out the most useful information. While group discussions



provide excellent insight, findings are not projectable to the national population due to the small size and the non-random nature of the sample.

**In-depth Interviewing**, or unstructured interviewing, is a type of interview which was used to elicit information in order to achieve a holistic understanding of the interviewee's perspective. This type of interview involved the use of open-ended questions and probing wherever necessary to obtain the relevant data.

i. Recruiting of participants

Participants for this phase were recruited to represent residents, farmers and business operators in the wetland. Respondents were selected from various communities located in the Negril EPA in Westmoreland and Hanover.

Communities selected for inclusion in this phase were visited and the discussions and interviews held. Prior to visits, Hope Caribbean Company Limited contacted key informants within the communities through organizations such as NEPA and RADA who work in the area. Where a contact was achieved, the researcher used the snowball technique to recruit other participants for in-depth interviews and focus group discussions.

ii. Other considerations

Both the focus group discussions and in-depth interviews were led by a trained Moderator using a topic guide developed to achieve the project objective.

The qualitative phase allowed for an understanding and exploration of the following:

- Knowledge:
  - a) Understanding of the term environment
  - b) Understanding of the term wetland
  - c) Understanding of the Negril Environmental Protection Area (Negril EPA)

- d) The wetland as a system where internal and external activities have an impact on the flora and fauna in it.
  - e) Knowledge of activities which harm the wetland
  - f) Understanding of wetland conservation
- Attitudes:
    - a) Importance of the environment
    - b) Importance of the wetland
    - c) Importance of the Negril Environmental Protection Area (Negril EPA)
    - d) Attitude towards the concept of environmental stewardship and wetland protection
    - e) Perceived responsibility of the environment and the wetland specifically
    - f) Perceived impact on the environment, positive and negative
  - Practices:
    - a) Activities engaged in which harm the environment and the wetland forest
    - b) Activities engaged in which protect the environment and the wetland forest
    - c) Understanding willingness to be stewards of the environment and engage in conservation: concerns and perceived challenges

This first phase of the project was also used as a discovery phase wherein the team conducted community walks to observe physical signs of environmental degradation and conservation activities.

### **Quantitative Approach Used:**

To achieve project objectives, a survey among a total of 700 residents and those engaged in commercial activities such as business operators, was conducted as a second phase to the project.

Findings from the qualitative phase of the project informed the final questionnaire development for the quantitative phase.

### **Areas for inclusion:**

The overall intervention project targeted the entire Negril Environmental Protection Area. Thus, for the KAPB, the research component, a random sample selection of residents from the Negril EPA was conducted. Areas included were randomly selected from the list of qualifying Enumeration Districts included in the appendix of this report.

### **Sample Details:**

In order to determine the appropriate sample size, data on the population size for each community was sought. The enumeration districts (ED) in the area and the associated ED population size was used to guide the sample size calculation.

**Table i: Population Size of the EDs within the Negril EPA**

<b>Communities within the sample Area</b>	<b>Population</b>
1. Westmoreland (39 EDs)	<b>17555</b>
2. Hanover (38 EDs)	15542
<b>Total Population</b>	<b>33097</b>

Sample size:

The total number of residents in the areas based on the 2011 Population Census was 33,097.

The sample size used was calculated using a web-based sample size calculator which was based on the following formula for large population sizes:

$$SS = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where:

Z = Z value (e.g. 1.96 for 95% confidence level)

p = percentage picking a choice, expressed as decimal (.5 used for sample size needed)

c = confidence interval, expressed as decimal (e.g., .04 = ±4)

Based on these calculations, the survey was conducted with a sample of 400 residents and 300 private sector stakeholders including farmers, tourist interests and other private sector stakeholders.

The calculations were made based on a confidence level of 95%, a confidence interval (error) of 5% or 0.05.

The ED functioned as the primary sampling unit. Based on STATINs listing, the project area was located in 39 EDs in Westmoreland and 38 EDs in Hanover. Based on the 2011 census, there was a projected population of 33,097.

The sample was quota controlled by gender to represent 50% male and 50% female and by age proportionate to the population.

Below documents changes in sample size experienced in data collection process:

**Table ii: Sample Size Details**

	<b>Projected Residential Sample</b>	<b>Actual Results of Residential sample</b>
Male	200	200
Female	200	200
15-24yrs	102	102
25-34yrs	85	86
35-44yrs	66	65
45-54yrs	60	60
55yrs and older	87	87
<b>TOTAL</b>	400	400

	<b>Projected Private sector Stakeholder Sample</b>	<b>Actual Results of Private sector Stakeholder Sample</b>
Farmers	100	100
Other private sector stakeholders	200	200
<b>TOTAL</b>	300	300

Private sector stakeholders included owners, operators and employees of relevant businesses such as hotels, restaurants, public transportation, supermarkets and aquatic services.

### Sample Selection:

#### Residential surveys:

A cross-sectional, household-based survey among a randomly selected sample of 400 persons in the project was conducted to provide data for this study. The target group included persons aged 15 years and older.

#### **i Sample Design and Selection**

1. The project area was divided into primary sampling units (PSU's) or Enumeration Districts.
2. A random sample of PSUs were selected. Twenty households were systematically selected from each ED and one person identified within each household as the person interviewed. Interviewers identified the households included with the use of a map of the area, by a random starting point and a pre-determined sampling interval. Within the household one (1) respondent was randomly selected to participate using the Kish card method.
3. The sample was quota controlled for age and gender.

The sample size enabled results projectable +/- 5% at a 95% confidence level.

The project conducted in-person surveys in selected EDs on weekday mornings/ afternoons and early evenings, as well as on Saturdays.

Interviewers approached a selected household in the selected ED using a random start point and a pre-determined sampling interval. Within a household one (1) respondent was randomly selected to participate using the Kish card method. Respondents who were at home at the time of the survey were interviewed.

### Farmer interviews:

Farmers were recruited through snowball sampling. We gained entry through RADA and other organizations working in the communities. Using these active entities, we were able to establish contact with farmers in the communities of interest. Contact was initially made with RADA and key farmers in the areas were identified and contacted. Using the snowball technique, contacted farmers were asked to refer other farmers for inclusion.

Data was collected in face-to-face interviews administered by trained interviewers.

### Other private sector stakeholders:

The survey of business operators developed its own sample frame. Specifically, interviewers entered the project area and did a basic listing of business areas within the wider project area. A listing was compiled based on observation and discussions with key stakeholders in the project area. This mapping exercise was used to generate a listing of business areas accordingly. This listing was used as the sample frame for the project. These areas functioned as the primary sampling unit. Areas to be included were then randomly selected.

### The survey instrument:

The instrument used a combination of close ended and open-ended questions to explore the following:

- Knowledge and awareness of:
  - Environmental concepts of the environment and wetland conservation
  - Basic ecosystem services provided by the Wetland
    - Provisioning:
      - Fisheries production
      - Pharmaceutical generation
      - Coastal protection
    - Regulating:

- Local climate and air quality, moderation of extreme events, waste water treatment, soil erosion prevention and maintenance of soil fertility, pollination, biological control
- Habitat or supporting services:
  - Habitat for juvenile fish
  - Nursery ground
  - Shoreline stabilization, water filtration and pollution regulation
- Socio-cultural services:
  - Recreation
  - Tourism
  - Educational opportunities
  - Aesthetic and cultural values
- Wetland as beneficial for the following:
  - Acting as a sediment trap
  - Acting as natural purifiers of the water
  - Acting as natural barriers and help mitigate flooding by reducing wave energy and slowing down storm surges
  - Supporting, preserving and balancing the ecosystem by releasing key nutrients
  - Acting as a refuge for aquatic species during extreme weather events such as hurricanes and storms
- Threats to the wetland
  - Environmental threats:
    - Invasive Alien species
    - Water pollution
    - Felling of trees
    - Brush Fires



- Anthropogenic/Human activity threats
    - Drainage of the wetland
    - Coastal Development
    - Unsustainable agricultural practices
    - Proliferation of Informal Settlements
  - Conservation
    - Conservation practices
  - Perceived condition of the wetland
- Attitudes towards:
  - The environment and land
  - The wetland as contributing to the community and country
  - Threats to the wetland
  - Cultural importance of the wetland
  - Environmental stewardship and conservation:
    - Willingness to practice conservation
    - Perceived importance of the environment
    - Perceived benefits and challenges
- Practices including:
  - Participation in destructive wetland activities
  - Farming practices employed
  - Use of conservation methods
  - Participation in conservation activities
  - Exposure to environmental stewardship or conservation interventions e.g. workshops, classes, etc.

The instrument was pilot tested followed by an extensive step by step process to develop the instrument. Initially, the research team:

- Developed the questionnaire
- Revised the instrument after client review
- Revised the instrument after in-depth discussions held in Negril with residents and stakeholders
- Revised after pre-test with community members in Hanover & Westmoreland

These steps were undertaken to ensure that the instrument captured credible and reliable data that could accurately inform relevant stakeholders. The instrument was simplified to ensure that there were no language barriers that would hinder the interviewers and interviewees from understanding each other during the interviewing process.

A total of fifteen (15) pilot test questionnaires were completed by a team comprising of two field interviewers and a Project Manager. The breakdown of completed pilot test questionnaires were as follows:

- Eight (8) in Red Ground, Westmoreland
- One (1) in Grey Ground, Westmoreland
- Six (6) in Orange Bay, Hanover

Data was collected in face-to-face interviews by trained interviewers. A Project Manager accompanied field interviewers to provide on the spot validation and problem solving. Participants were randomly selected in central locations of communities specified. Participants represented varying age groups between the ages of 19-67years old. The time taken to administer each questionnaire was between 42 to 52 minutes, with an average time of 43 minutes.

Based on responses received from the questionnaires and the interviewing team, the questionnaire was generally thought to have flowed well and was generally understood by most. However, a few adjustments were made to ensure the instrument was most effective.

## Quality Control

To ensure the validity and reliability of data collected, various quality control measures were implemented. Quality control measures were completed by supervisor and are as follows:

- On-the-spot supervision of the first five interviews of each interviewer. Where necessary, interviewers were replaced or additional training provided.
- 20% listening to audio recording of completed interviews for each interviewer.
- An average survey speed was calculated and used as the standard survey time. The average survey is unique to each project. Hence, those surveys completed before the standard survey timing were removed;
- Supervisors working closely with the research management team and senior managers of Hope Caribbean to monitor the performance of interviewers.
- 100% checks were done for accuracy, incompleteness, omission, and otherwise erroneous data. Where necessary, callbacks were done to ensure satisfactory completion of instruments. If not, the instruments were replaced.

## Limitations:

- The project relied on respondent recall and self-report and therefore might be limited accordingly.

## Results of Fieldwork

As per sampling procedure, the sample was quota controlled by gender, age group, socio-economic level, and place of residence (electoral division and parish) representational to the population. The socio-demographic characteristics of the respondents who participated in the quantitative portion of the study is detailed below.

**Table 1a: Socio-Demographic Characteristics of Sample**

	(N=700) %
<b><u>Gender</u></b>	
Male	49.4%
Female	50.6%
<b><u>Age Group</u></b>	
15-24y	18.3%
25-34y	21.6%
35-44y	18.9%
45-54y	16.6%
55-65y	17.9%
65y and older	6.7%
<b><u>Education</u></b>	
No schooling	0.1%
All-age/Primary/Prep School	20.9%
Secondary/High/Technical School (CXC)	55.5%
Vocational (HEART, NCTVET)	11.3%
Tertiary (College, University)	11.1%
Other	1.1%
<b><u>Parish</u></b>	
Hanover	46.3%
Westmoreland	53.7%
<b><u>Type of Respondent</u></b>	
Farmer	14.3%
Resident	57.1%
Business Owner	11.8%
Employee	16.1%
Not recorded	0.7%

**Table 1b. Sample Distribution by Location**

ED #	Communities visited within the ED	Residents (n=400)	Other Respondents (n=300)
	Within the town centres of EPA	-	100%
W65/ W69/ W70/ W71/ W73/ W74/ W75	Whitehall/Good Hope/Green Island/ Haughton Hall/Rhodes Hall/Mount Pleasant	37.3%	-
W1	The Great Morass	5.2%	-
W56/ W57	Delve Bridge/Spring Garden	5.2%	-
W58	Retreat	5.0%	-
W59	Sheffield	5.5%	-
W76	Red Ground/ Ireland Pen, Rutland Pen	5.2%	-
W77	Negril	5.0%	-
W79/ W80	West End/ Winchester	10.4%	-
W40	Spring Valley	5.0%	-
W92	Fish River	5.2%	-
W96	Campelton	5.2%	-
W42	Harding Hall	5.2%	-

## Chapter 4 Findings

### SECTION 1: Situation Analysis from the business owner and residents' perspectives, a qualitative view:

The following analysis documents the results of the focus group discussion and in-depth interviews held with residents and business owners of the Negril EPA.

Majority of business owners and residents indicated that life was good in Westmoreland and Hanover. They were happy with life for the most part and noted that there was much to enjoy in these parishes. The tourism industry was a major highlight for participants, as this sector was known to provide the vast majority of job opportunities in Hanover and Westmoreland. Parties, going to the beach and other social gatherings were seen as adding to the excitement of life in Westmoreland and Hanover.

However, the majority of business owners and residents noted that there were many concerns which made life in Westmoreland and Hanover almost unbearable. The major environmental concerns highlighted were the lack of water in pipes, flooding and lack of proper disposal of garbage. The lack of water said to be in relation to poor supply of water in pipes. This they noted was due to a technical issue with the water facility designated to distribute water to communities. Outrage was also expressed as there was believed to be inequality in water distribution. It was noted that communities in the town centers and hotels, resorts and other tourist attraction had proper water supply. However, the water was not being distributed to other communities. This they noted was deliberate to ensure that those areas were sufficiently supplied with water to keep tourist coming at the detriment of other communities.

*"It's a big concern because you have to rely in rainfall. But I have a tank to catch water"*

*"Some persons get water while others don't, the pressure is low."*

*"When we can't get water in our lane, I go out on the front and lock off the pipe (NWC) that goes to other community dem on di main so it can come down to us in di lane."*

*"When dem ready fi it (water) dem come turn it on back"*

*"We not even a get water but we a get a bill"*

Improper garbage disposal was said to not only be a community issue, but was also a major problem in town centers. This they attributed to lack of frequent collection of garbage as well as the blatant disregard of individuals to take care of their environment. It was noted that in instances where there was infrequent collection of garbage, residents resorted to dumping garbage in empty / unused lands as well as burning the garbage. Additionally it was noted that residents would also dump the garbage in the Great Morass.

*“Di garbage bin deh right deh so and dem just walk and throw it inna di Morass”*

*“One a di big bin inna di community and dem just throw di garbage inna dem backyard right inna di Morass”*

*“Mi can’t even fin’ space fi walk miss, mi affi a walk inna di road di way how dem full up do empty lot wid garbage”*

Other concerns cited were unemployment, poverty, lack of housing and crime and violence. These were seen to have crippling effects on the community as unemployment resulted in many unattached youths who in return plague the residents with criminal activity, especially “scamming”. In addition, the lack of employment was also attributed to the limited or narrow opportunities that existed. It was noted that majority of the employment was in the tourism sector which made acquiring jobs outside of this field difficult. The lack of housing was also a concern for many as it was noted that the government was not doing enough to provide housing, as such, squatter settlements emerged. Nevertheless, the majority were of the impression that these squatter settlements were not an issues as they noted that it “is a good thing fi see di youths dem a try, at least dem a try own something fi dem self.”

*“The cost of housing scheme are so high so people just squat”*

*“Jamaicans make it work by living on eth gully side, in trees and on top of each other”*

*“In Hanover they gave away land that is not accessible to the people. There is no light, road or water up there.”*

These issues and concerns have detrimental effect on the environment and the Great Morass. However, the majority, although aware of The Great Morass, were unable to properly articulate

its purpose. Nevertheless, they were all of the view that it was very important to life in Westmoreland, in particular Negril. Further to this, there seems to be great disassociation from nature, except for farmers. Environmental problems were in reference to immediate concerns and issues affecting daily life such as crime and lack of money and jobs. This would explain the majority view that the protection of the environment was NEPA, business owners and government's responsibility. In fact it was believed that those who have direct interaction with The Great Morass would have the greater responsibility to ensure that it is protected. A few participants noted that it was the people's responsibility to protect the environment.

Although, the majority noted that they would be interested in a beach clean-up day or other activities that would assist in protecting the environment, it is evident that it is necessary to correct the attitudes that exist to the environment. Residents need to be aware of and understand that their activities can have a positive or negative impact on the environment and in return affects life and livelihood in their communities. Additionally, it is important to address the social ills that exists in Hanover and Westmoreland. This is so as these are of immediate concern to residents and addressing same could help in actively stemming the environmental issues that exists.



## Section 1: Knowledge and Awareness

- **The Main Concerns Of Those Living and Working In The Negril EPA:**

Overall, respondents described the main concerns of the Negril EPA to be socio-cultural and economic in nature. Specifically, main problems described as being present in the Negril EPA communities were unemployment (25.4%), violent crime (18.7%), lack of water (12.1%) and poverty and hunger (10.9%). (Table 2) These were confirmed as main concerns in the focus group discussions and in-depth interviews. It was also evident that unemployment was a particular sore point with younger residents (those 15-25yrs).

*“The only job is to work in a call centre or hotel, when you do degree to be architect you can’t get no work”* **Focus group Discussion, 15-24y, Mixed Gender**

*“They need to make more jobs or do some training to learn a skill. Maybe some people would come off the road and do something. The only thing to do is become a scamman, that earn nuff money”* **Focus group Discussion, 15-24y, Mixed Gender**

**Table 1: Most Serious Socio-Cultural and Economic Problems in Community Today by Parish and Respondent Type**

	% of respondents							
	Hanover (n=324)	Westmor eland (n=376)		Farmers (n=100)	Business Owners (n=83)	Employees (n=113)	Residents (n=400)	Total (N=700)
Unemployment	26.9	24.2		29.0	25.3	25.7	24.5	25.4
Violent crime	21.0	16.5		8.0	26.5	23.0	18.5	18.7
Lack of Water	7.4	16.5		14.0	10.8	15.9	10.8	12.1
Poverty and Hunger	10.8	10.9		16.0	8.4	8.0	11.0	10.9
Corruption	6.2	5.6		3.0	6.0	2.7	7.2	5.9
Youth dropping out of school	4.9	5.6		5.0	1.2	4.4	6.5	5.3
Garbage collection and solid waste management	4.6	4.5		2.0	3.6	4.4	5.5	4.6
The global economic downturn	3.1	1.9		4.0	2.4	0.9	2.5	2.4
Lack of Education	2.2	2.4		4.0	4.8	3.5	1.0	2.3
Lack of Healthcare	1.5	1.1		1.0	1.2	0.9	1.5	1.3
Global warming/ Climate Change	1.2	1.1		1.0	1.2	0.9	1.2	1.1
Health and disease (Diabetes, HIV/AIDS etc.)	0.9	0.8		0.0	0.0	0.9	1.2	0.9
Other Crime	0.3	1.6		1.0	2.4	1.8	0.2	0.7
Squatting	0.3	1.1		1.0	1.2	1.8	0.2	0.7
Sewage treatment and disposal	0.0	0.8		0.0	1.2	0.0	0.5	0.4
Domestic abuse and Child abuse	0.3	0.3		0.0	0.0	0.9	0.2	0.3
Loss of trees and animals	0.0	0.5		0.0	0.0	0.0	0.5	0.3

**Table 2: Most Serious Socio-Cultural and Economic Problems in Community Today by Gender and Age**

	% of respondents									
	Male (n=346)	Female (n=354)		15-24y (n=129)	25-29y (n=151)	35-44y (n=132)	45-54y (n=116)	55-65y (n=125)	Over 65y (n=47)	Total (N=700)
Unemployment	20.5	30.2		24.8	24.5	25.8	20.7	33.6	19.1	25.4
Violent crime	19.1	18.1		16.3	18.5	15.2	22.4	22.4	14.9	18.7
Lack of Water	11.8	12.7		14.7	9.3	14.4	18.1	8.0	6.4	12.1
Poverty and Hunger	10.7	11.0		8.5	11.9	10.6	7.8	8.0	29.8	10.9
Corruption	7.2	4.5		5.4	9.3	5.3	6.0	3.2	4.3	5.9
Youth dropping out of school	6.4	4.2		10.9	4.6	4.5	4.3	3.2	2.1	5.3
Garbage collection and solid waste management	3.8	5.4		1.6	7.3	7.6	5.2	2.4	0.0	4.6
The global economic downturn	2.9	2.0		1.6	2.6	1.5	4.3	1.6	4.3	2.4
Lack of Education	2.6	2.0		3.1	1.3	4.5	1.7	1.6	0.0	2.3
Lack of Healthcare	1.2	1.4		3.1	1.3	0.0	0.0	2.4	0.0	1.3
Global warming/ Climate Change	1.2	1.1		0.0	0.0	0.8	0.9	4.8	0.0	1.1
Health and disease (Diabetes, HIV/AIDS etc.)	0.9	0.8		1.6	0.0	0.8	0.0	0.8	4.3	0.9
Other Crime	1.2	0.8		0.8	0.7	1.5	1.7	0.0	2.1	0.7
Squatting	1.2	0.3		0.0	1.3	0.8	0.0	1.6	0.0	0.7
Sewage treatment and disposal	0.3	0.6		0.8	0.0	0.8	0.9	0.0	0.0	0.4
Domestic abuse and Child abuse	0.3	0.3		0.8	0.7	0.0	0.0	0.0	0.0	0.3
Loss of trees and animals	0.6	0.0		0.8	0.0	0.0	0.0	0.0	2.1	0.3

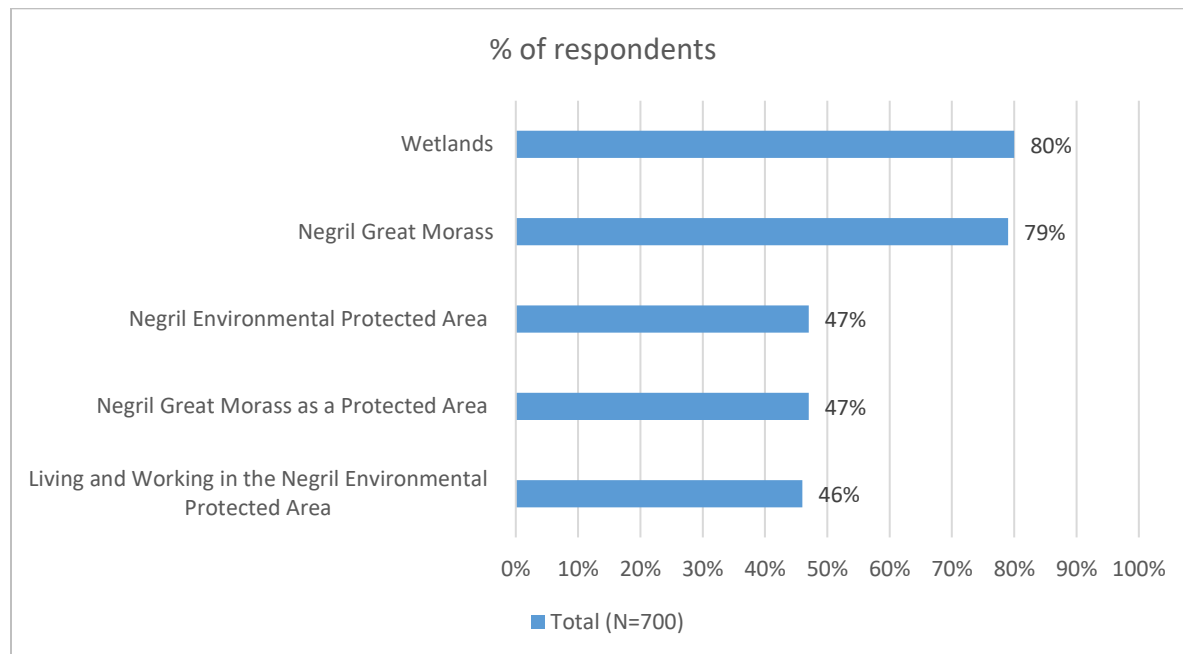
**Environment and Wetland Areas**

The majority of respondents (80%) had a general awareness of wetlands and could correctly identify the various elements associated with this system. There was also a high awareness of the Negril Great Morass, with 79% of respondents being aware. Interestingly, respondents were more likely to recall the Negril Great Morass when prompted (68%) than being unprompted (11%).

Just under a half of respondents (47%) stated that they were aware of the Negril Environmental Protection Area (Negril EPA), equivalent to the number of respondents that were aware that The Negril Great Morass was a protected area. Similarly, 46% of respondents indicated that they lived and worked within the Negril EPA, which suggests that the majority of the respondents were unaware of their direct involvement in the sustenance of the Negril EPA.

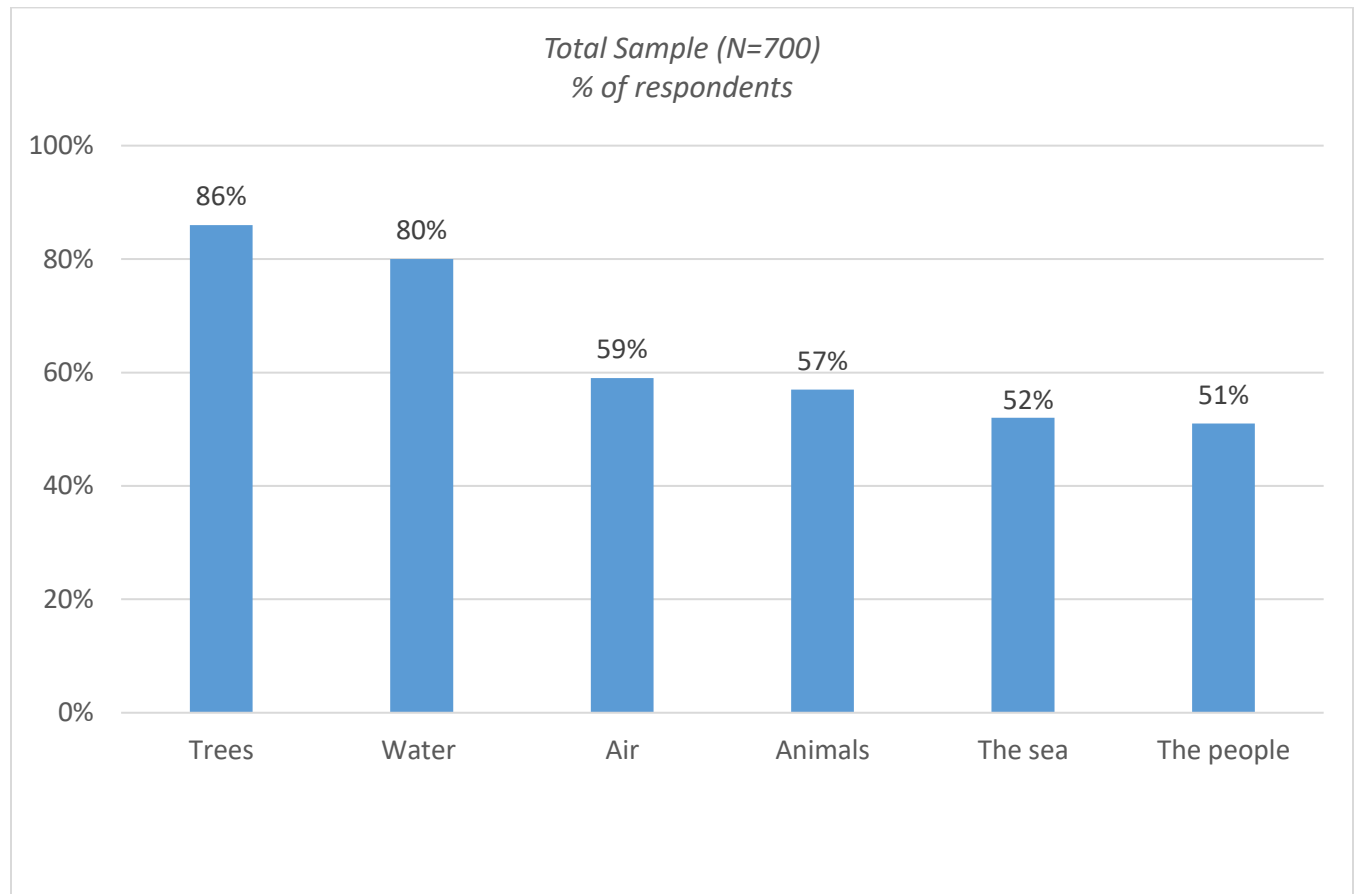
Although there was a high general awareness of wetlands and The Negril Great Morass, there was much lower awareness of the Negril EPA and the Negril Great Morass as a protected area.

*(Figure 1)*

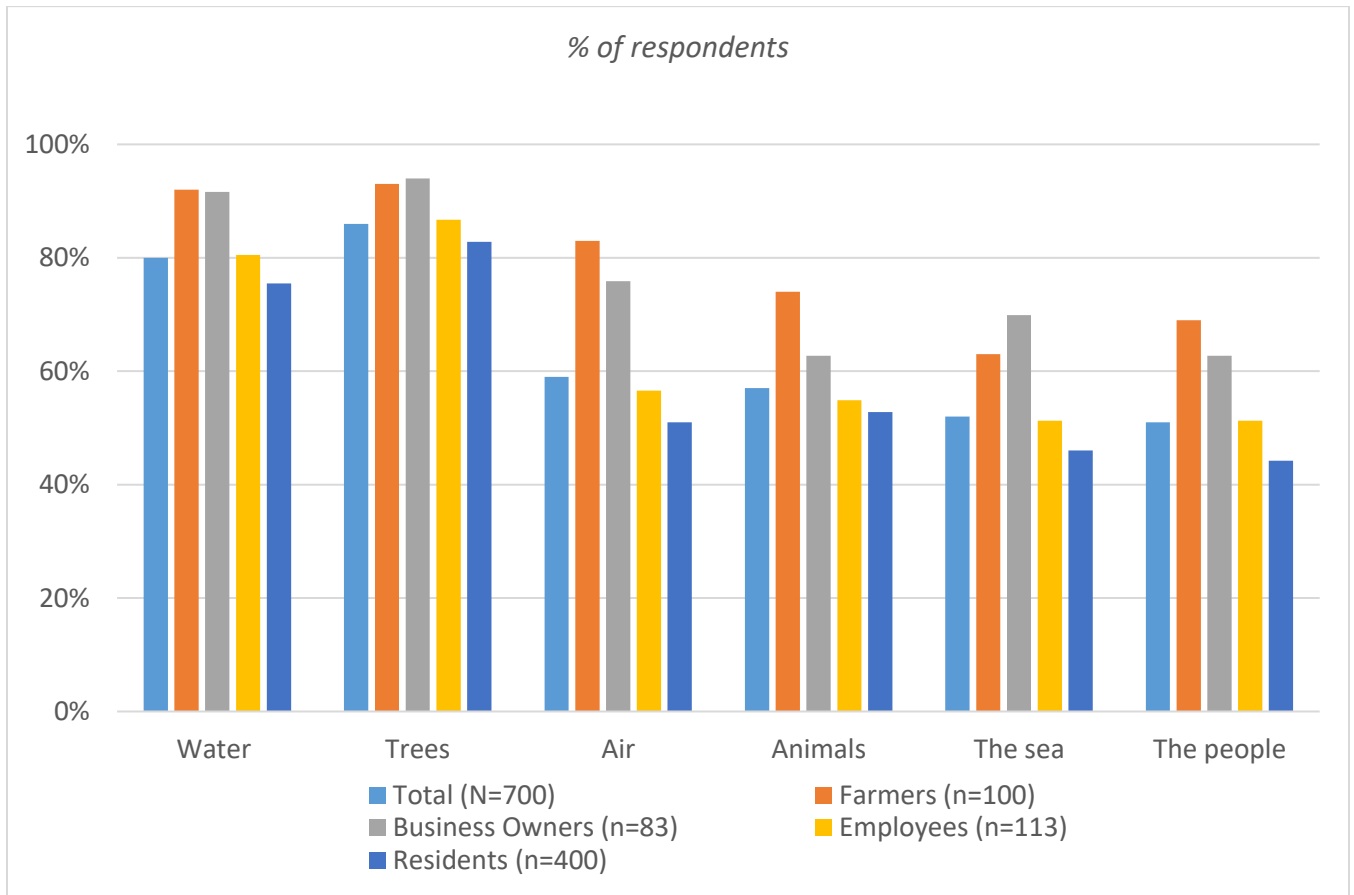


**Figure 1: Overall Awareness of Wetlands and the Negril Environmental Protection Area**

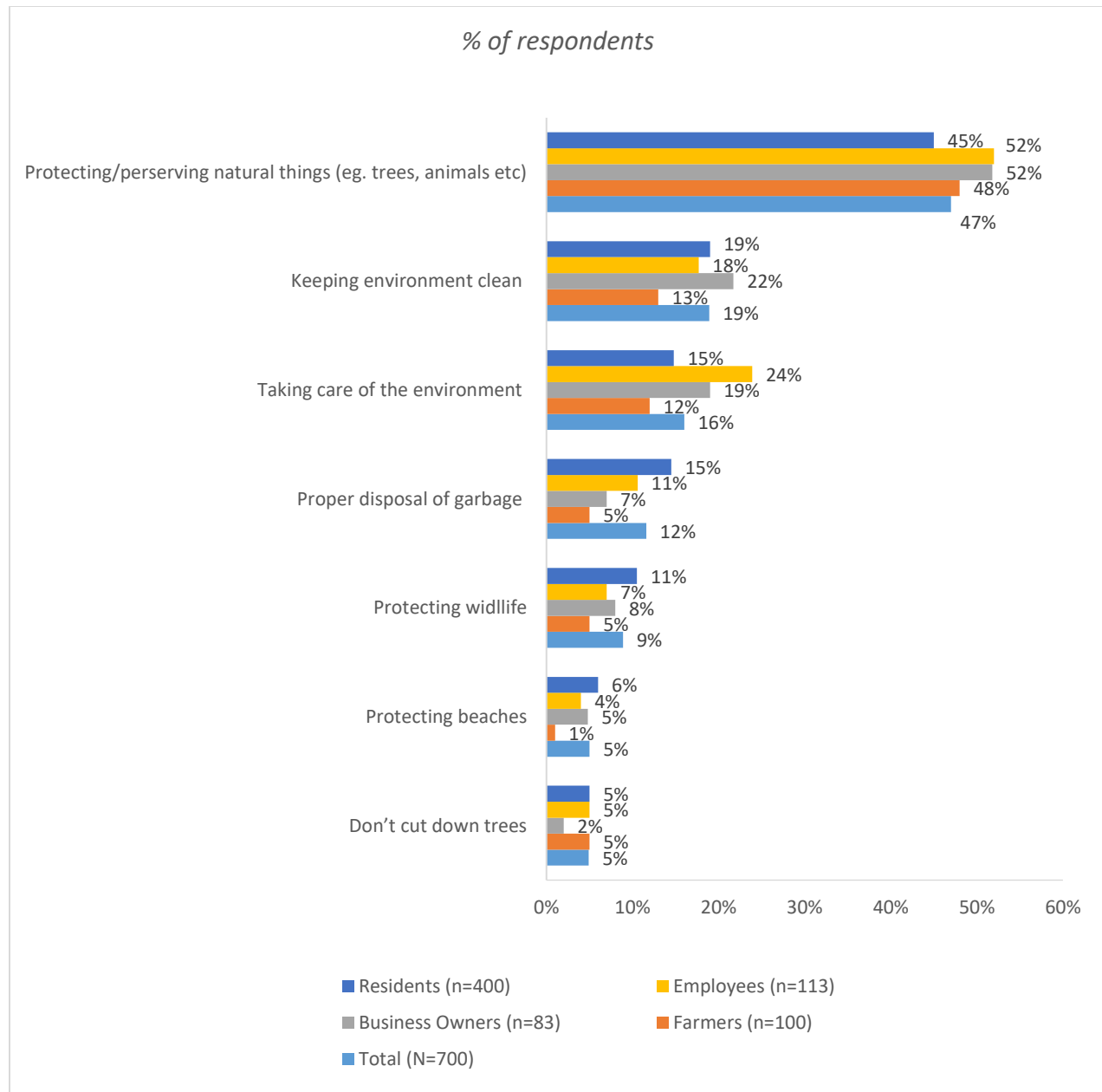
The majority of respondents were able to correctly identify elements associated with the environment as illustrated in Figure 1. These were mainly in relation to elements of nature and included water, trees, air, animals and the sea as well as people. Interestingly, business owners and farmers were more likely to identify correct elements of the environment than residents and employees. This was especially true for water, air, animals, sea and people. This did not translate to a comprehensive understanding of environmental management. Just under a half of respondents were able to associate environmental management to protecting/preserving natural things (47%). Additionally, keeping the environment clean (19%) and taking care of the environment (16%) were also mentioned. (Figure 4)



**Figure 2: Top 6 Words Associated with Environment**

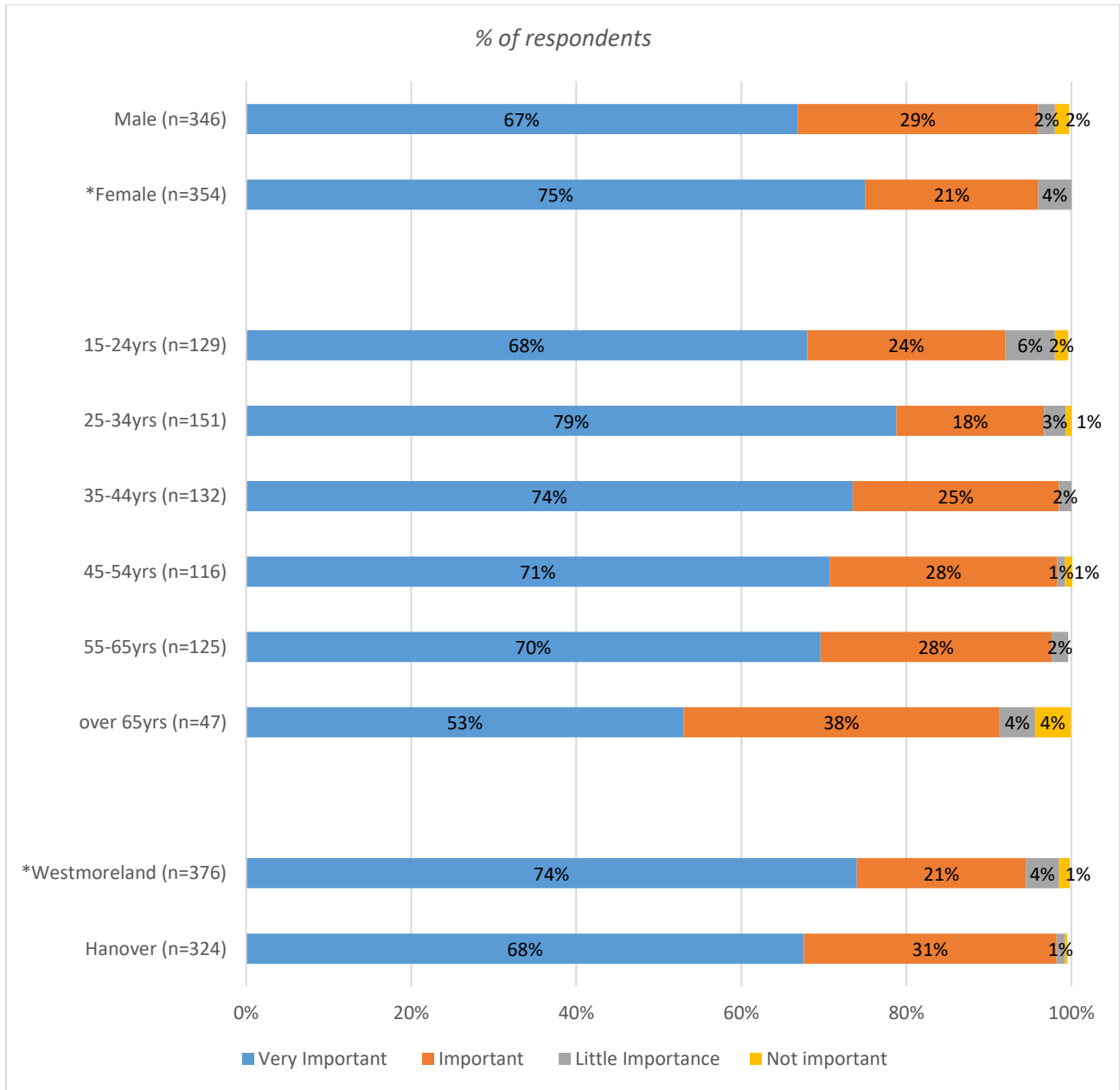


**Figure 3: Top 6 Words Associated with Environment by Respondent Type**



**Figure 4: Top Responses for “when you hear the phrase environmental management what comes to mind?” By Demographics**

There was widespread acknowledgement of the importance of the environment and majority correct understanding of the meaning of wetlands. The environment was recognised by all (99%) as being important to community development with the vast majority endorsing it as very important to community development (71%). This recognition was higher among females (75%) and those living in Westmoreland (74%). (Figure 5)



**Figure 5: Importance of Environment to Community Development by Demographics**

\*p≤.005

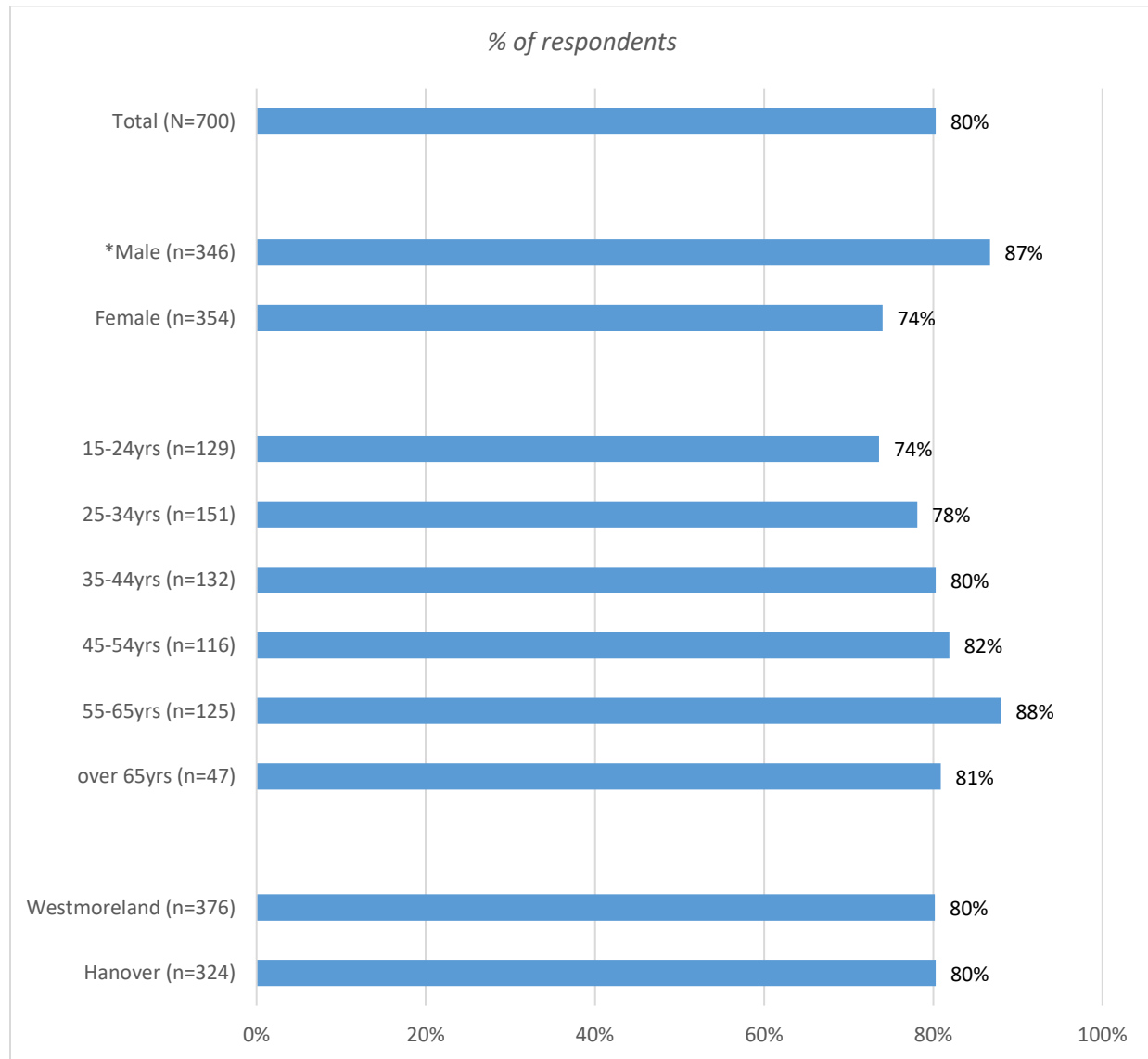


Additionally, the majority of respondents (71.7%) were able to correctly associate the appropriate words with wetlands. Top responses for “what come to mind when you hear wetlands” were swamp (31.4%) and morass and (31.1) (Table 4)

**Table 3: Awareness of wetlands based on unprompted responses to the question: When you hear the word wetlands what comes to mind?**

	% of respondents (N=700)
<b>Correct responses (identifies wetland as a specific ecosystem including plants and water)</b>	
Swamp	31.4
Morass	31.1
Mangrove	7.6
Wildlife Sanctuary	1.3
Marsh	0.3
<b>Other responses</b>	
Rainfall	3.9
Pond	3.4
Landslide	2.6
Wet muddy land	2.4
River	2.0
Water	1.3
Nature	1.1
Beaches	0.9
Don't know	7.4

While there was almost universal endorsement of the environment as important, it was males (87%) who showed greater awareness of wetlands than females (74%). Awareness of wetlands also generally increased with age group, as evidenced by the older participants being more likely to indicate awareness of wetlands. (Figure 6)



**Figure 6: Awareness of Wetlands in or around Hanover and Westmoreland by sample demographics**

\*p≤.005

Overall, less than a half of respondents (43.1%) were able to spontaneously associate correct words with the term mangrove. Terms classified as correct were those that indicated an awareness of mangroves being trees/ plants and water together. Main terms associated with mangrove were wetland (14.6%), morass (13%), trees growing in water (10.9%) and swamp (7.7%). While many were aware of the term mangrove, more than a quarter (27.7%) reported being unaware of the term. (Table 5)

**Table 4: When you hear the word mangrove what comes to mind?**

	% of respondents (N=700)
<b>Correct responses (identifies mangrove as a specific area with plants and water):</b>	
Wetland	14.6
Morass	13.0
Trees growing in water	10.9
Swamp	7.7
<b>Other responses:</b>	
Trees/shrubs/forest	14.1
A protected area where wild animals live	9.4
Wildlife/animals	3.0
River	1.1
Water	2.6
Coastline	1.3
Don't know	27.7

*Total percentage equals more than 100 due to multiple responses*

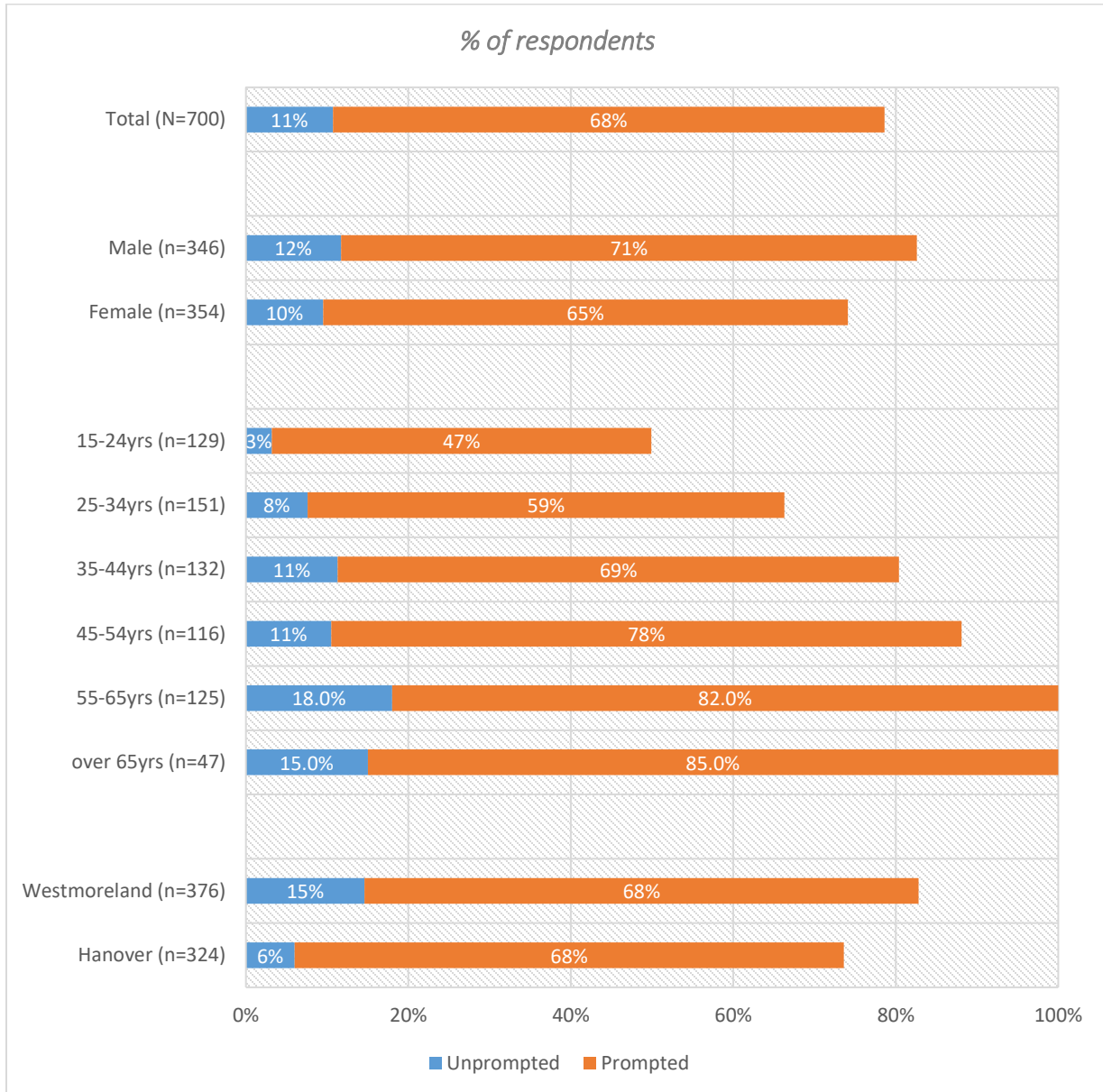
There was also relatively high spontaneous awareness of the term “swamp”. Overall, most (82.5%) were able to associate correct words with the term swamp without being prompted. Specific words classified as correct were those that included some reference to water. These terms included: a morass (23%), a large place where water is settled (20.4%), wetland (19.3%), soft/muddy soil (12%), dark/dirty/muddy water (4.4%) and mangrove (3.4%). (Table 6)

**Table 5: When hear the word swamp what comes to mind?**

	% of respondents (N=700)
<b>Correct responses (identifies mangroves as a specific area with plants and water):</b>	
Morass	23.0
A large place where water is settled	20.4
Wetland	19.3
Soft/Muddy Soil	12.0
Dark/Dirty/Muddy Water	4.4
Mangrove	3.4
<b>Other responses:</b>	
Wildlife habitats	8.1
Water	6.3
Lake/pond	5.6
Animals	4.4
Forest/Tree/Plants	1.6
Don't know	3.1

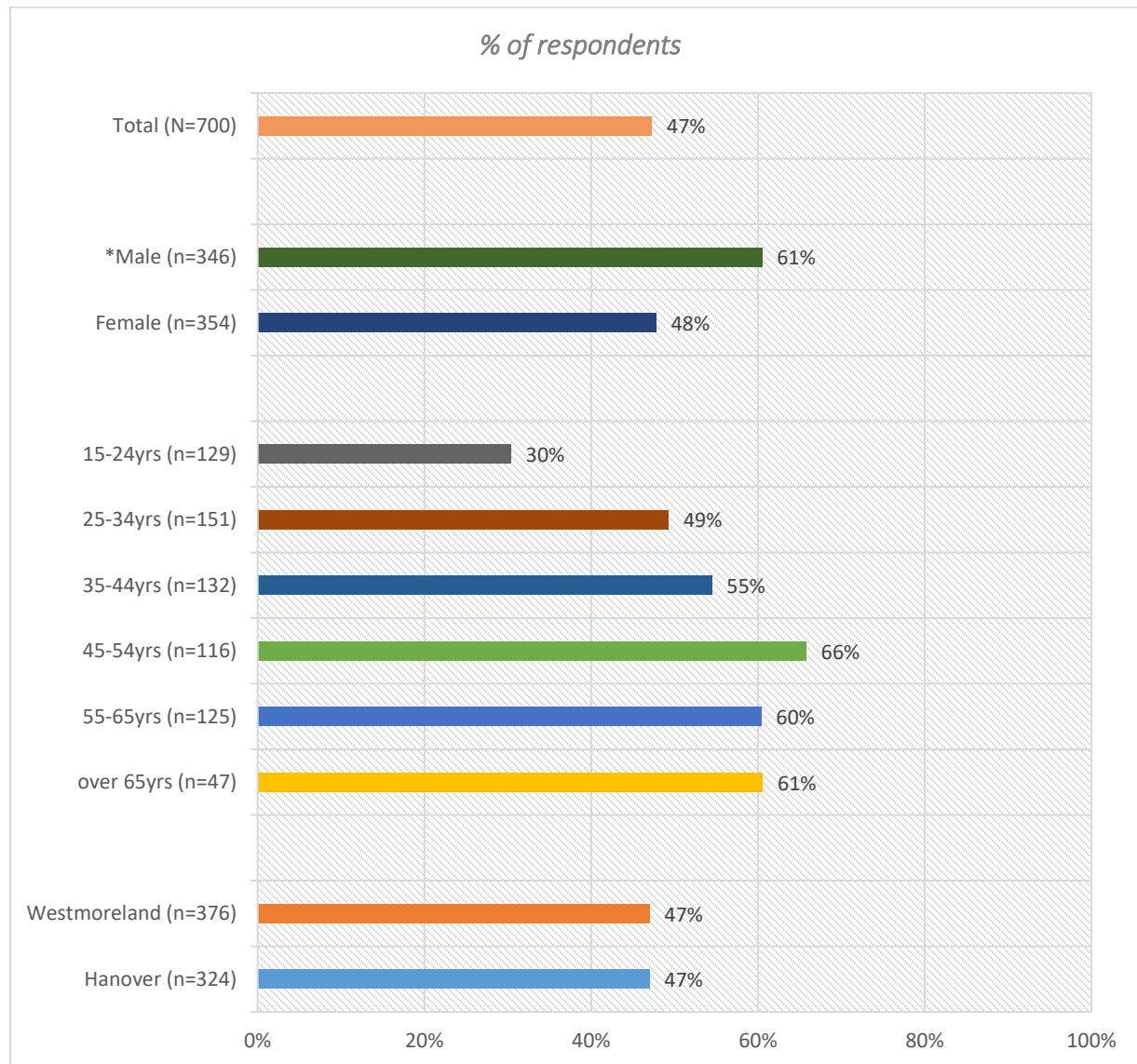
*Total percentage equals more than 100 due to multiple responses*

While respondents are aware of the Negril Great Morass, it is not necessarily in the forefront of their minds. This was evident in the finding that respondents were more likely to recall the Negril Great Morass when prompted (68%) than being unprompted (11%). As with wetlands, prompted recall increased with older cohorts. Specifically, older participants were more likely to recall The Negril Great Morass. (Figure 7)



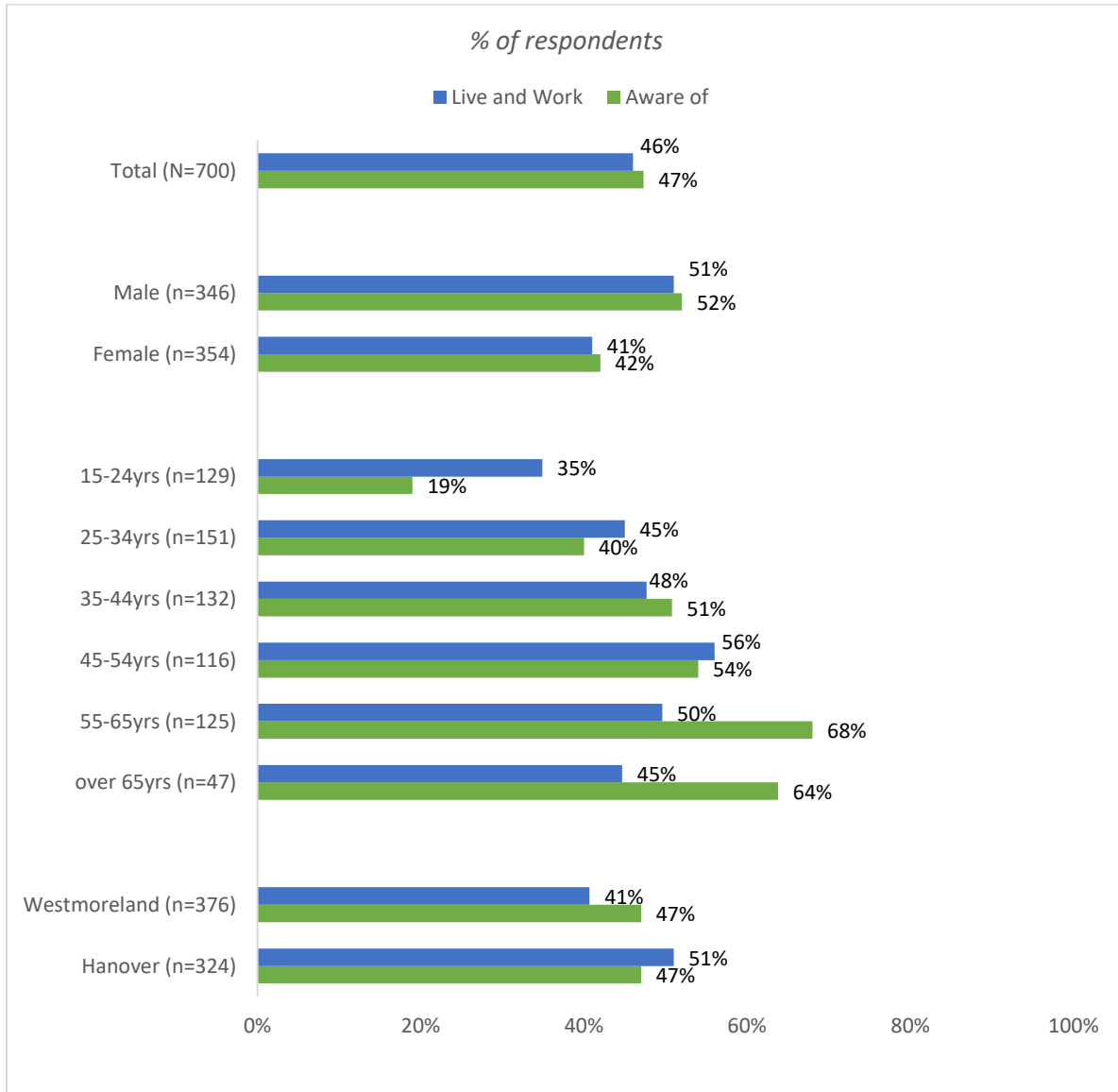
**Figure 7: Unprompted and Prompted Awareness of Negril Great Morass**

Almost a half (47%) of respondents were aware that The Negril Great Morass was a protected area. Males (61%) and the older age cohorts (45-54y 66%; 55-65y 60%; over 65y 61%) were more likely to be aware that The Negril Great Morass was a protected area. Awareness of the Negril Great Morass as a protected area was lowest among respondents 15-24yrs (30%). (Figure 8)



**Figure 8: Prompted Awareness of the Negril Great Morass as a Protected Area**  
 \*p<sub>≤</sub>.005

While all respondents in the study lived and worked in the Negril Environmental Protection Area (Negril EPA), it was less than a half (47%) who stated that they were aware of the Negril EPA and a similar portion (46%) who indicated that they lived and worked within the Negril EPA. Awareness was highest among the older cohorts; 55-65y (68% aware of) and over 65yrs (64% aware of) and lowest among those 15-24yrs (19%). (Figure 9)



**Figure 9: Prompted Awareness of the Negril Environmental Protection Area vs. Respondent Awareness that they Live and Work in the Negril Environmental Protection Area**

Public clean up days (84.6%), planting trees whether fruit, timber, palms and mangroves (77.1%) and proper disposal of household waste (73.4%) were cited as top ways in which the Great Morass and Negril EPA could be protected. (Table 7)

**Table 6: Ways to protect/preserve The Great Morass and Negril EPA: Prompted Awareness by Parish and Respondent Type**

	% of respondents							
	Hanover (n=324)	Westmor eland (n=376)		Farmers (n=100)	Business Owners (n=83)	Employees (n=113)	Residents (n=400)	Total (N=700)
Public clean up days	85.5	83.8		85.0	88.0	87.6	82.8	84.6
Planting Trees whether fruit, timber, Palms and Mangroves	77.5	76.9		81.9	81.9	75.2	73.0	77.1
Proper disposal of household waste	72.2	74.5		74.0	75.9	79.6	70.8	73.4
Proper waste disposal (chemical, solid waste and garbage)	67.6	70.7		70.0	74.7	76.1	65.8	69.3
Proper disposal of animal waste/manure	61.4	66.8		72.0	66.3	69.0	60.2	64.3
No lighting /Controlled lighting of fires	56.8	60.6		72.0	57.8	61.1	54.8	58.9
No fishing in protected areas	56.8	60.6		59.0	61.4	62.8	53.2	56.9
Replanting trees in the wetlands/mangrove areas	54.6	55.3		66.0	63.9	57.5	49.5	55.0
No overfishing of an area	51.2	55.9		58.0	57.8	53.1	51.5	53.7
Reduce over fertilizing or use organic fertilizer (no chemical is used at all and takes a longer time to grow)	46.0	45.5		65.0	44.6	50.4	39.2	45.7
Placing fish pots at the edge of the mangrove/ wetland	22.5	23.9		39.0	19.3	23.0	19.8	44.6
No fishing in the mangrove	45.1	44.1		47.0	47.0	49.6	42.0	44.6
None of the above	2.5	2.7		3.0	1.2	2.7	2.8	2.6



While proper waste disposal was an activity which would contribute to the protection of the Negril EPA, focus group discussions and in-depth interviews with residents revealed that proper waste disposal had been a concern for them. This concern is compounded by the lack of necessary infrastructure such as garbage trucks with frequent collection of garbage as well as garbage bins/ skips in communities and town centers.

*“Miss mi inna my community dere is an open lot and di people just throw dem garbage inna it, mi can’t even find place to walk the way how it full up.....the garbage truck hardly come so they dump it or burn it” (Focus group discussion, 15-24y)*

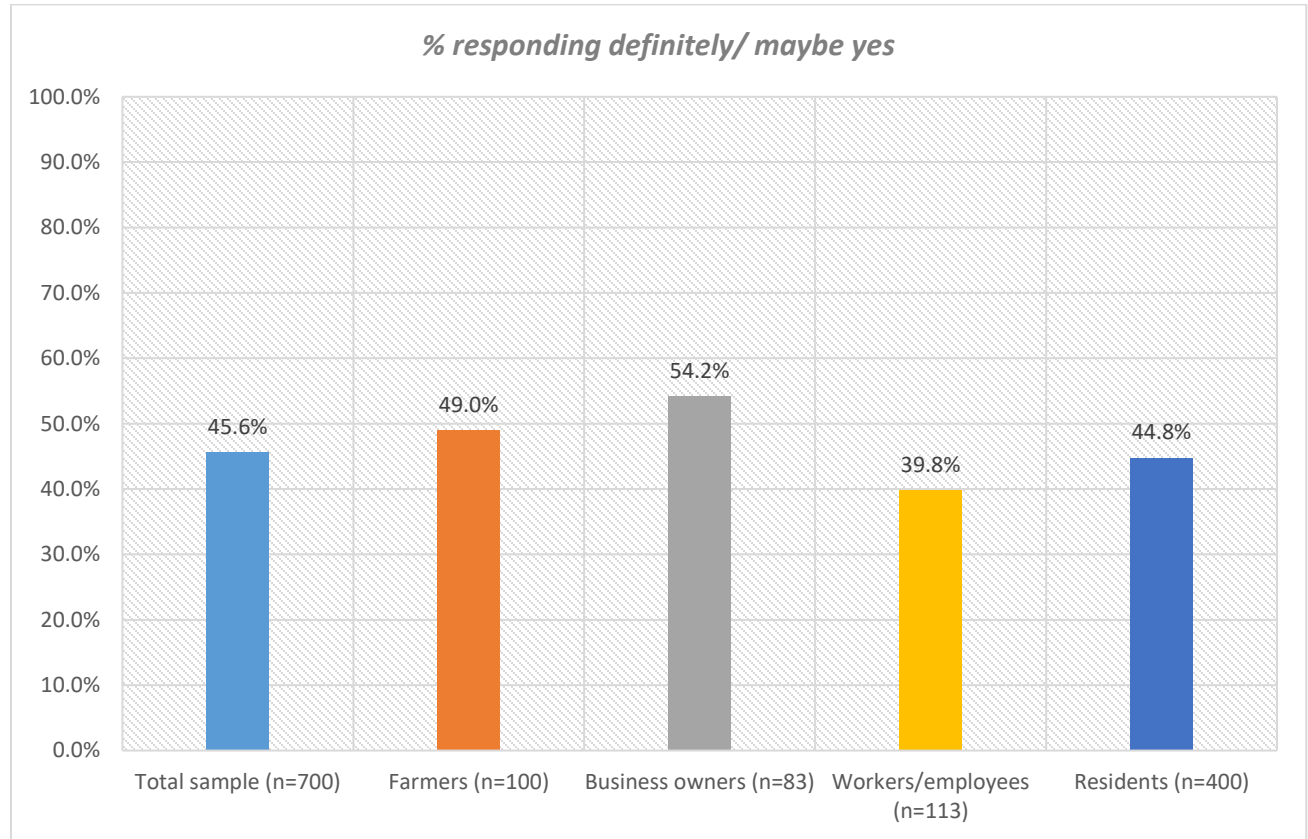
*“Miss mi affi burn my garbage, no truck nah come” (Focus group Discussion, 15-24y)*

### **Knowledge of Ecosystem Services Provided by the Wetland**

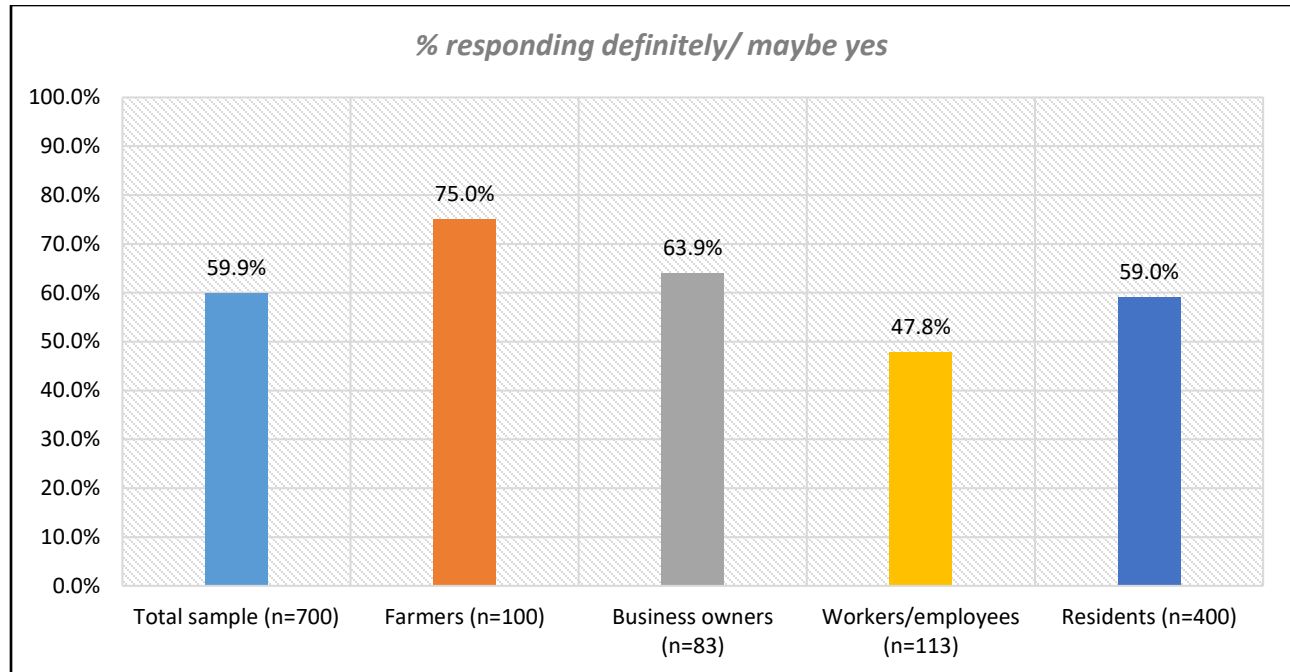
In order to understand the overall level of knowledge of the ecosystem services provided by the wetland, a score was computed for each of the three parameters comprising ecosystem services. These were hydrological functions, provision of resources and ecosystem functions. The score was calculated as the percentage of persons who answered correctly (definitely/maybe yes) to all items probed for each parameter.

The score measurement showed overall moderate knowledge levels. Knowledge was highest for the provisions of resources function and lowest for the ecosystem functions of the wetlands. It was 59.9% who were aware of all the provision of resource functions, 45.6% who were aware of all the hydrological functions and 41.7% who were aware of all the ecosystem functions of wetlands. (Figure 10-12)

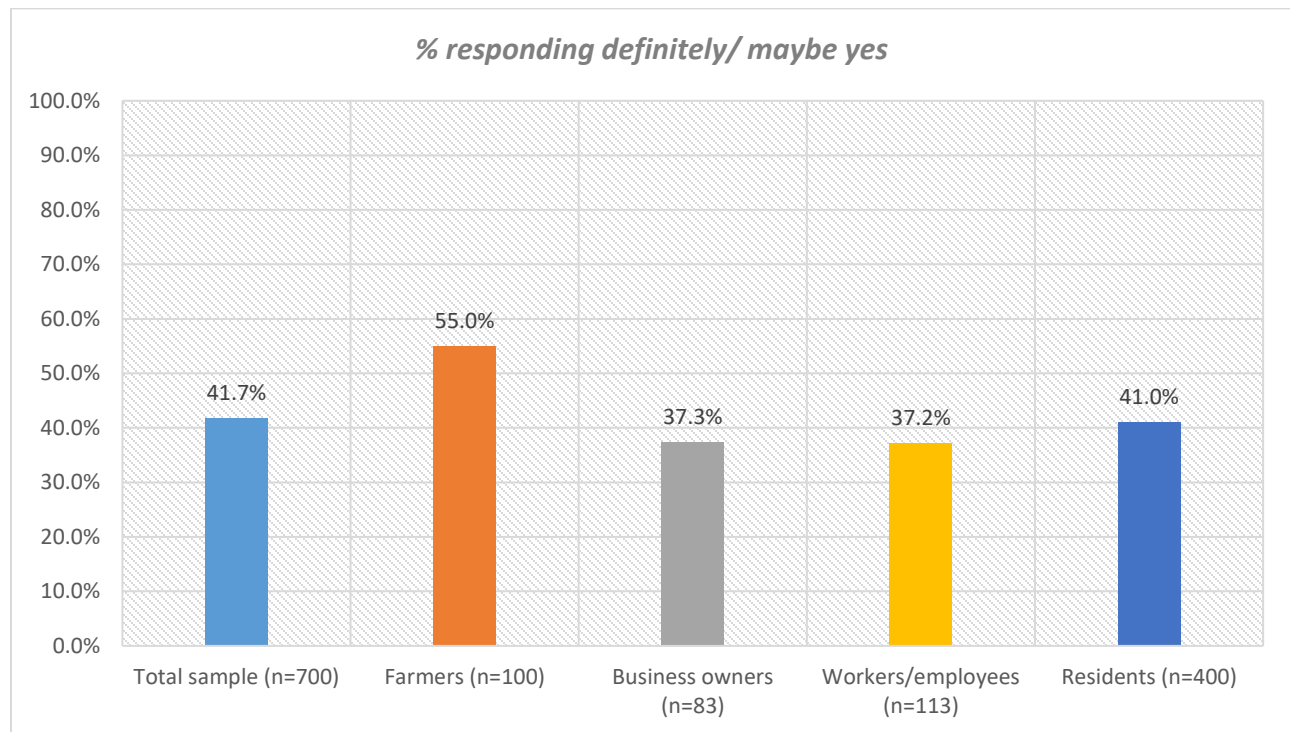
Of the respondent groups included, business owners displayed higher knowledge of the hydrological function of the wetlands. In contrast, farmers displayed highest knowledge of the provision of resources and ecosystem functions of the wetlands. (Figures 10-12)



**Figure 10: Knowledge of Ecosystem Services Provided by the Wetland: Strongly Agree/definitely yes by Respondent Type: Hydrological Functions**



**Figure 11: Knowledge of Ecosystem Services Provided by the Wetland: Strongly Agree/definitely yes by Respondent Type: Provision of Resources Functions**



**Figure 12: Knowledge of Ecosystem Services Provided by the Wetland: Strongly Agree/definitely yes by Respondent Type: Ecosystem Functions**

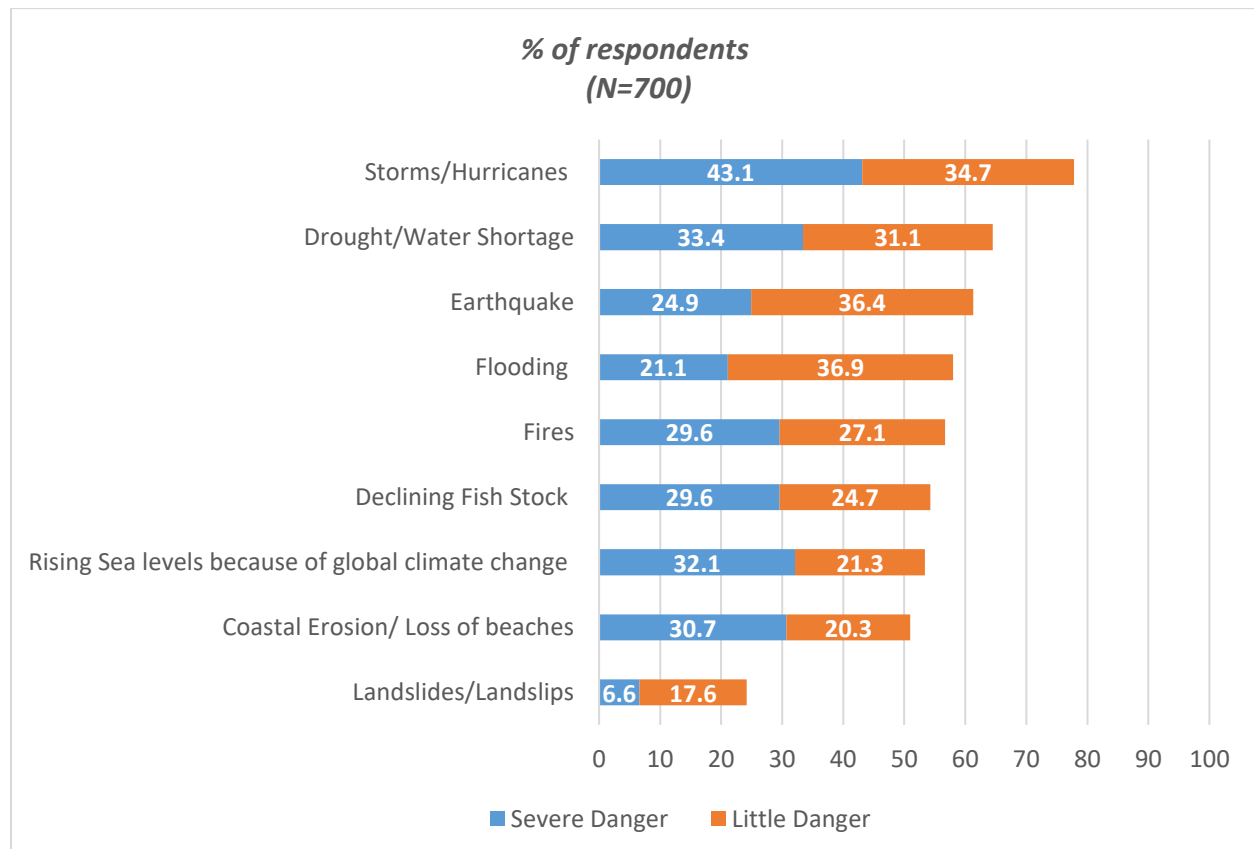
**Table 7: Knowledge of Ecosystem Services Provided by the Wetland: Strongly Agree/definitely yes by Respondent Type**

	% of respondents				
	Total Sample (N=700)	Farmers (n=100)	Business Owners (n=83)	Employees (n=113)	Residents (n=400)
<b>HYDROLOGICAL FUNCTION</b>					
Helps protect areas in Negril EPA from the full impact of storms*	35.1	42.0	39.8	31.0	34.0
Helps protect areas in the Negril EPA from flooding	33.1	39.0	36.1	30.1	32.2
Helps protect areas in the Negril EPA from beach erosion*	27.1	33.0	27.7	23.0	26.5
Prevents high tides from destroying the coastline and act as a buffer against strong winds	32.0	42.0	32.5	28.3	30.8
Improves water quality by filtering water passing through it to the sea*	31.0	43.0	38.6	24.8	28.2
The roots of mangroves hold soil firmly to prevent erosion by waves, rain and high tides	37.7	48.0	31.3	31.0	38.8
<b>PROVISION OF RESOURCES</b>					
Allow animals to feed and reproduce in a protected and safe area so they can increase in numbers*	43.6	53.0	38.6	42.5	43.0
Is important for maintaining fish stock of the area	38.9	46.0	39.8	38.1	37.5
Is important for the variety of animal and plants in the area	39.2	50.0	36.1	37.2	37.8
Provides a beautiful natural appearance/view in the area	38.0	50.0	37.3	36.2	36.0
Provides job opportunities e.g. Fishermen, Divers etc.	33.1	43.0	21.7	30.1	34.2
<b>ECOSYSTEM FUNCTIONS</b>					
Provide a home for and support and the survival of the unique plants and animals of the area	41.9	47.0	37.3	46.0	40.8
Removes and stores carbon dioxide from the atmosphere and so is important to help prevent global warming	35.3	42.0	32.5	36.3	34.2
Provide activities for fun and pleasure	17.1	26.0	16.9	15.0	15.8
Provides recreational activities linked to tourism	30.1	42.0	25.3	29.2	28.8
Provide sights for visitors who come to the country annually to view, which in turn generates income for the country*	35.4	47.0	26.5	36.3	34.5
Improve the overall beauty of the area	32.3	37.0	32.5	32.7	31.2

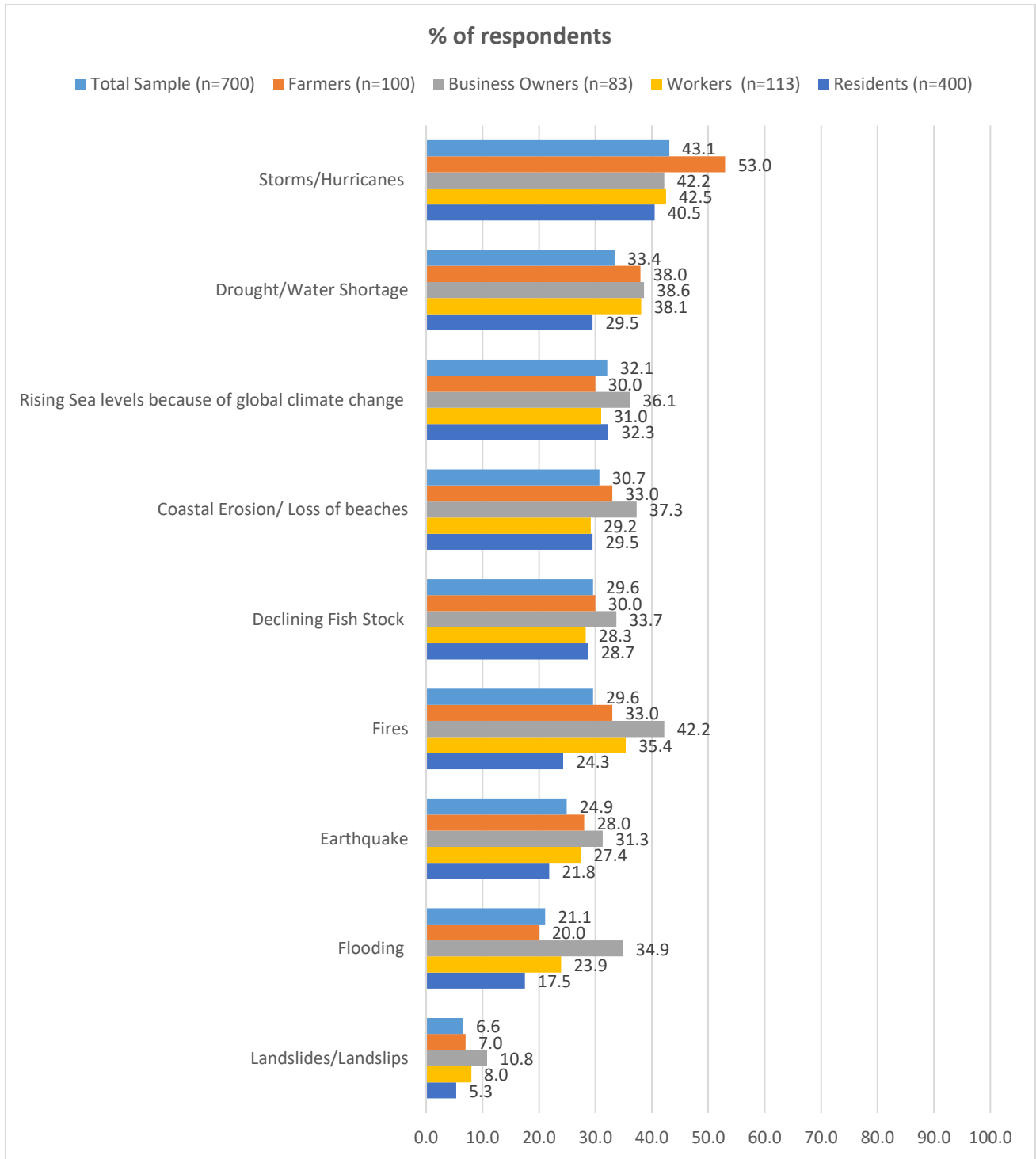
\*<.005

Main natural events which may pose threats to the community and their livelihood were identified as storms/ hurricanes (77.8%), drought (64.5%), earthquakes (61.3%) and flooding (58%). The flooding concern was further explained in the focus group discussions where it was said to be a result of an ineffective drainage system.

Natural dangers, as a result of the health of the coastal environment were less likely to be endorsed as dangers to the community. Specifically, it was just over a half of respondents who identified declining fish stock (54.3%), rising sea levels (53.4%) and coastal erosion (51%) as dangers to their community. (Figure 13). Further to this, farmers were more likely to indicate storm/hurricanes (53%) as a severe threat/danger to the community than their counterparts. Whilst, business owners were more likely to indicate fires (42.2%) and flooding (34.9%) as severe threats/dangers to the community than their counterparts. (Figure 14)



**Figure 13: Percentage reporting the following as dangers to their community**



**Figure 14: Extent to the following are perceived as severe threats/dangers to the community by Respondent Type**

Main threats to the wetland were identified as being related to improper waste/garbage disposal. These included: garbage getting into the water (75.7%), dumping up of wetlands (64.4%), water pollution from businesses including hotels and villas (61.9%) and dumping up of mangroves (56.1%). (Table 9)

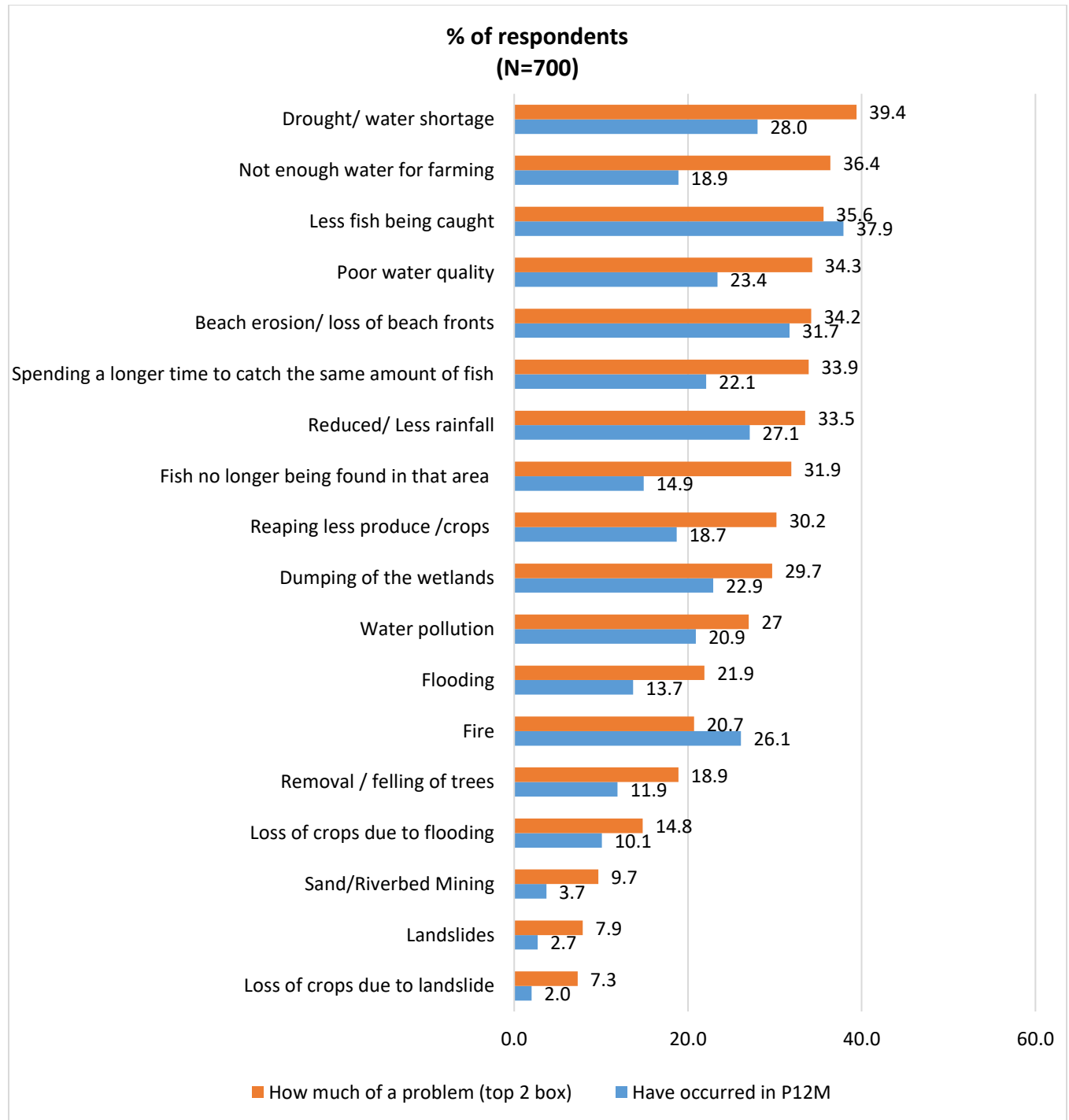
**Table 8: Knowledge of threats to the Wetland**

	% of respondents							
	Hanover (n=324)	Westmo reland (n=376)		Farmers (n=100)	Business Owners (n=83)	Employees (n=113)	Residents (n=400)	Total (N=700)
Garbage getting into the water	79.0	72.9		80.0	77.1	77.0	74.0	75.7
Dumping up of mangroves	56.8	55.6		61.0	68.7	62.8	50.8	56.1
Water pollution from businesses including hotels and villas (chemical, solid waste and garbage)	66.0	58.2		71.0	67.5	63.7	57.5	61.9
Cutting down of trees	62.0	52.9		67.0	71.1	60.2	50.8	57.1
Water pollution from homes (chemical, solid waste and garbage)	58.3	55.9		65.0	63.9	64.6	51.5	57.0
Fires	44.4	51.3		61.0	55.4	47.8	43.8	48.1
Burning of Land by fire	47.2	47.3		57.0	59.0	46.9	42.8	47.3
Water pollution from garages (chemical, solid waste and garbage)	50.0	43.1		58.0	59.0	46.9	40.8	46.3
Dumping up of wetlands	64.8	64.1		67.0	71.1	77.0	59.2	64.4
Drought (shortage of rain)	43.5	44.4		44.0	57.8	50.4	39.0	44.0
Unplanned settlements in and around the wetland	45.7	43.6		53.0	57.8	44.2	40.0	44.6
Water pollution from farms (chemical, solid waste and garbage)	45.4	40.7		53.0	51.8	44.2	38.0	42.9
Dredging of rivers	34.3	29.3		45.0	34.9	32.7	27.2	31.6
Use of Fertilizers	28.1	25.8		31.0	33.7	25.7	24.8	26.9
Grazing of animals	19.1	20.2		19.0	26.5	21.2	18.0	19.7

Water shortage in the form of drought, insufficient water for farming and poor-quality water were the environmental related issues seen as most problematic for the community. More than a third (39.4%) perceived drought as a serious threat to the community, followed by 36.4% who cited insufficient water for farming and a similar portion (34.3%) who cited poor quality water as serious problems for the community. While water supply related concerns were the issues most commonly perceived as serious problems by respondents, respondents had actually experienced other issues, including beach erosion and reduced fish stock. Based on respondent self-report, the main issues experienced in the past 12 months were reductions in number of fish being caught (37.9%), beach erosion (31.7%), drought (28%) and reduced rainfall (27.1%). *(Figure 15)*

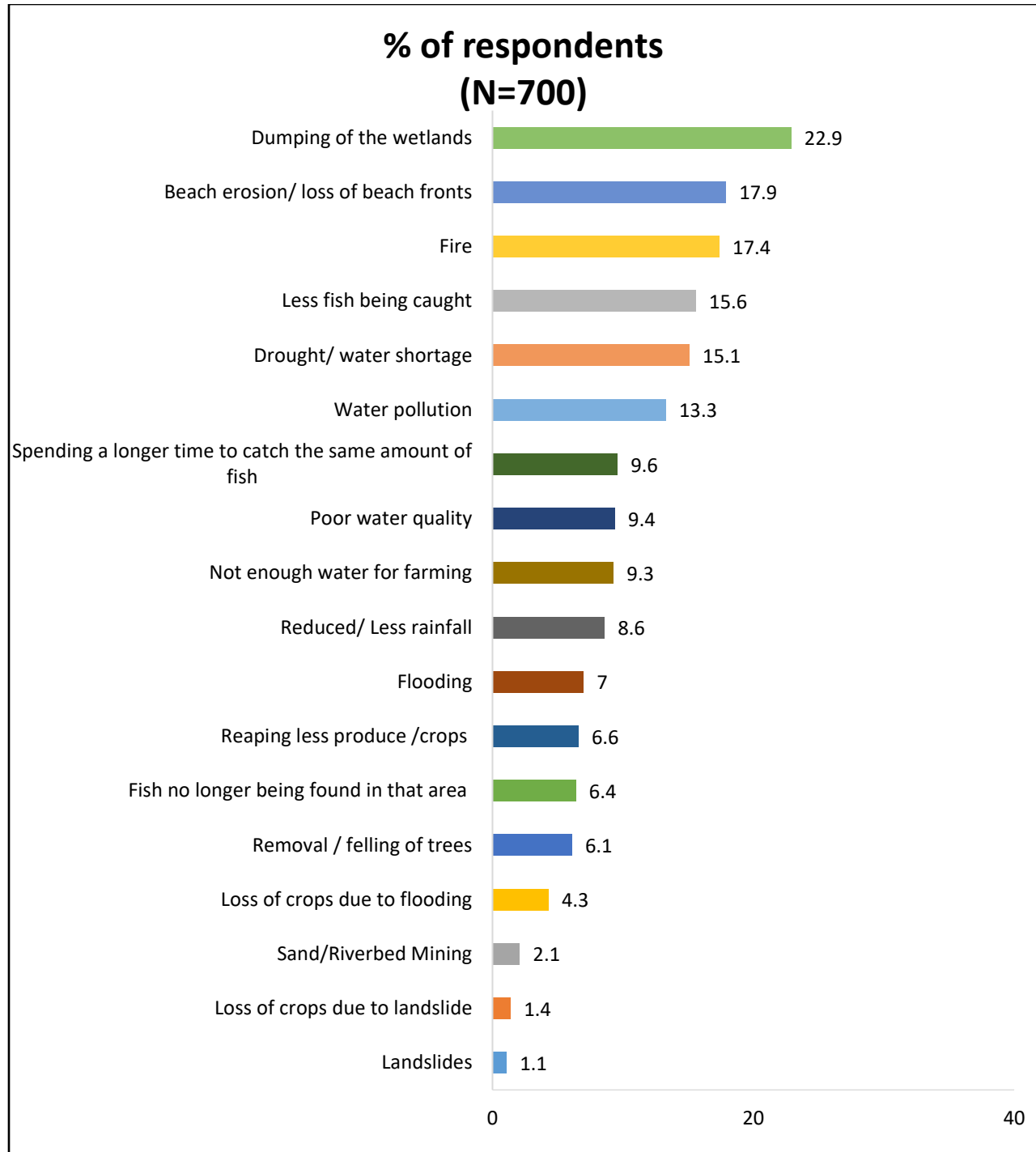
Overall, dumping of the wetlands was rated as a somewhat/most severe problem (29.7%). It was identified as having occurred within the past 12 months (22.9%) and labeled the most severe problem for the area by just over a fifth (22.9%). *(Figure 15 & 16)*





**Figure 15: Natural Events as Dangers to the Community- Perceived severity vs occurrence within past 12 months<sup>1</sup>**

<sup>1</sup> Question: Thinking about The Negril Great Morass and wider Negril Environmental Protection Area, which includes your community, how much of a problem are each of the following? Please tell me on a scale of 1-5 where the bigger the problem the higher the score you give it.



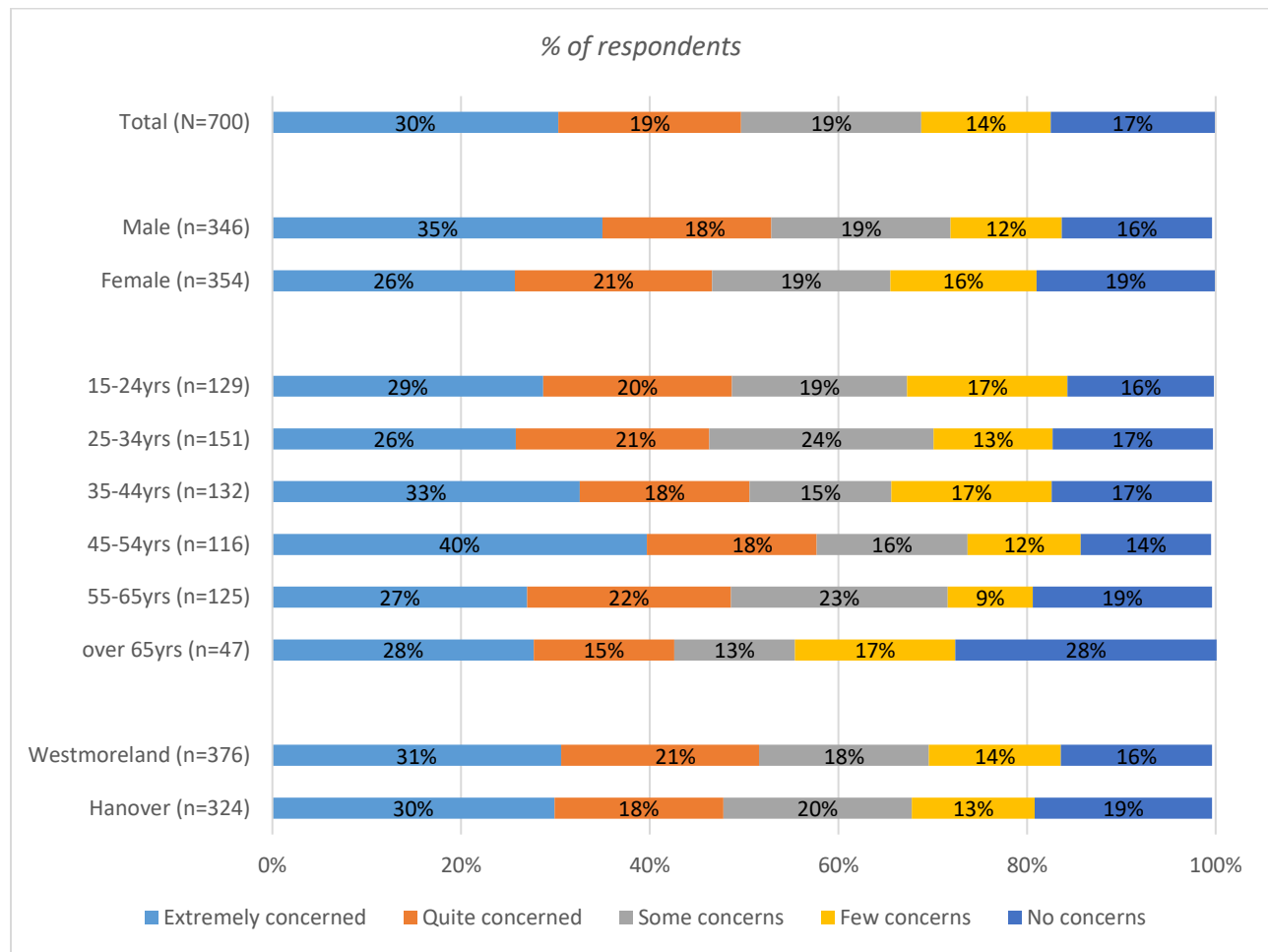
**Figure 16: Most Severe problem faced by the area**

“Which in your opinion is the biggest/most severe problem The Negril Great Morass and wider Negril Environmental Protection Area faces?”

## Section 2: Attitudes towards Environment, Wetlands, Negril EPA And Environmental Stewardship

### The Environment and Land

Almost a half of the respondents (49%) indicated that they were extremely/quite concerned about the natural surroundings of their community. Concern was highest among males (35% extremely concerned) and those 45-54yrs (40% extremely concerned). (Figure 17)



**Figure 17: Extent to which concerned or worried about nature, or the natural surroundings of your community by Demographics**

Top reasons respondents were extremely/quite concerned about the natural surroundings of their community were because “We have to take care our surroundings/if we destroy nature we destroy ourselves” (17.6%), “I have a lot of love for the environment” (8.7%) and “Clean environment provides fresh air/surroundings need to be kept clean” (6.6%). (Table 10)

**Table 9: Reasons for being extremely concerned/quite concerned about nature, or the natural surroundings of your community**

	% (n=346)
<b>We have to take care our surroundings/if we destroy nature we destroy ourselves</b>	17.6
<b>I have a lot of love for the environment</b>	8.7
<b>Clean environment provides fresh air/surroundings need to be kept clean</b>	6.6
<b>Improper garbage disposal can cause flooding</b>	5.8
<b>Destruction of trees/Deforestation</b>	5.5
<b>Poor water quality/Water pollution</b>	4.6
<b>Destruction of wild life</b>	4.6
<b>Nature provides us with food/air/nature provides plants and animals</b>	4.6
<b>Trees promote rainfall/ helps to keep the keep the community healthy</b>	4.3
<b>Trees provide oxygen</b>	4.0
<b>Improper garbage disposal can cause health problems/Harboring mosquitos/breed rats/respiratory illness</b>	4.0
<b>Shortage of water</b>	3.5
<b>Killing out the fish stock in the area</b>	3.2
<b>Can cause landslide/erosion</b>	1.7
<b>It is a tourist attraction/ will generate income for the country</b>	1.7
<b>Dumping of the land to build for tourism</b>	1.2

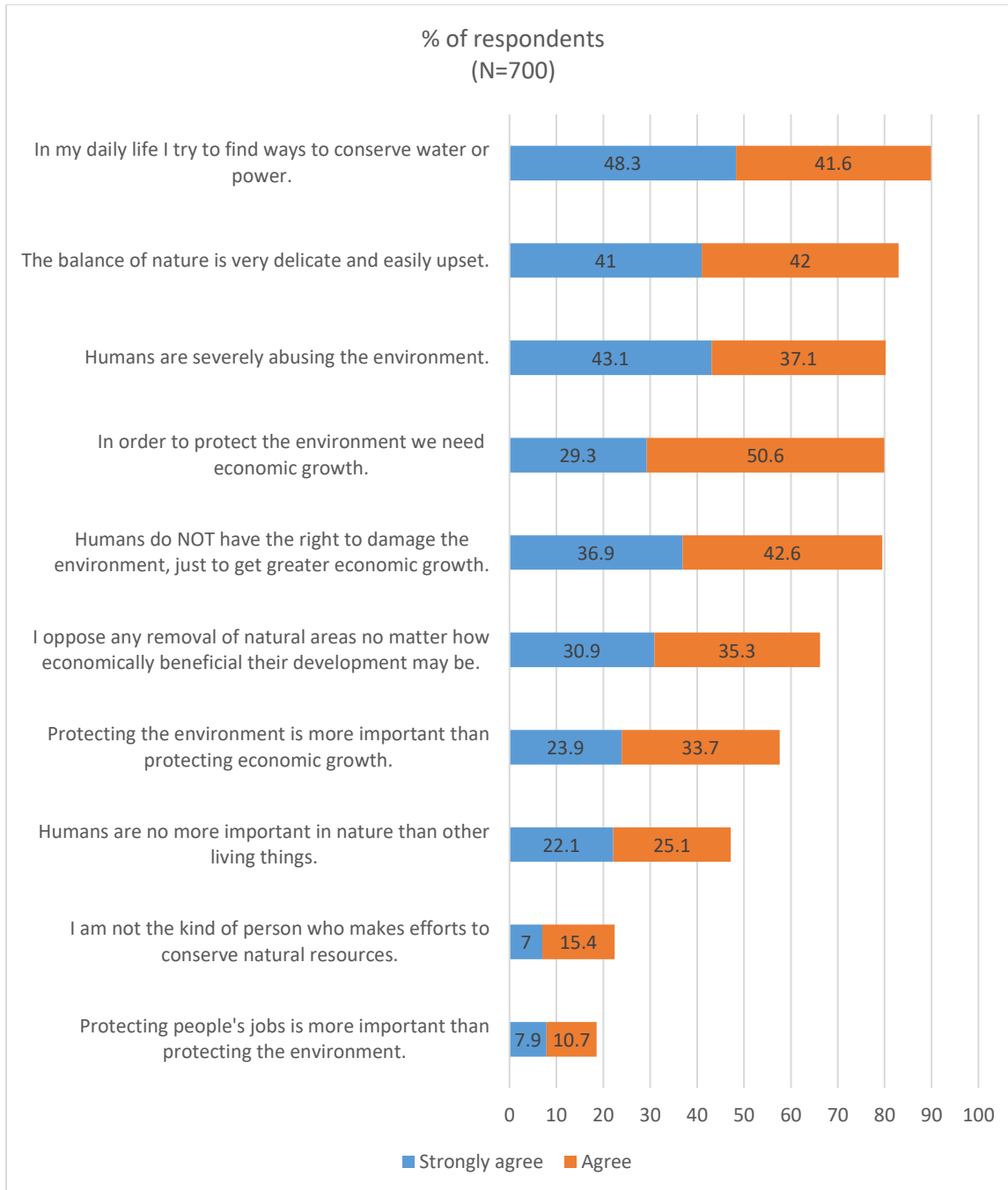
Respondents were generally cognizant of the fact that each individual had an impact on the environment and that there was a need to take care of it. This was evident in the majority agreement (strongly agree/agree) that “in my daily life I try to find ways to conserve water or power” (89.9%), “the balance of nature is very delicate and easily upset” (83%) and “humans are severely abusing the environment” (80.2%). (Figure 18)

Additionally, just over a half of respondents (53.3%) supported an environment centered view as they endorsed at least three (3) of the following four (4) statements:

- *“Humans do NOT have the right to damage the environment, just to get greater economic growth” (strongly agree/agree),*
- *“Protecting the environment is more important than protecting economic growth” (strongly agree/agree),*
- *“I oppose any removal of natural areas no matter how economically beneficial their development may be” (strongly agree/agree) and*
- *“Humans are no more important in nature than other living things” (strongly agree/agree).*

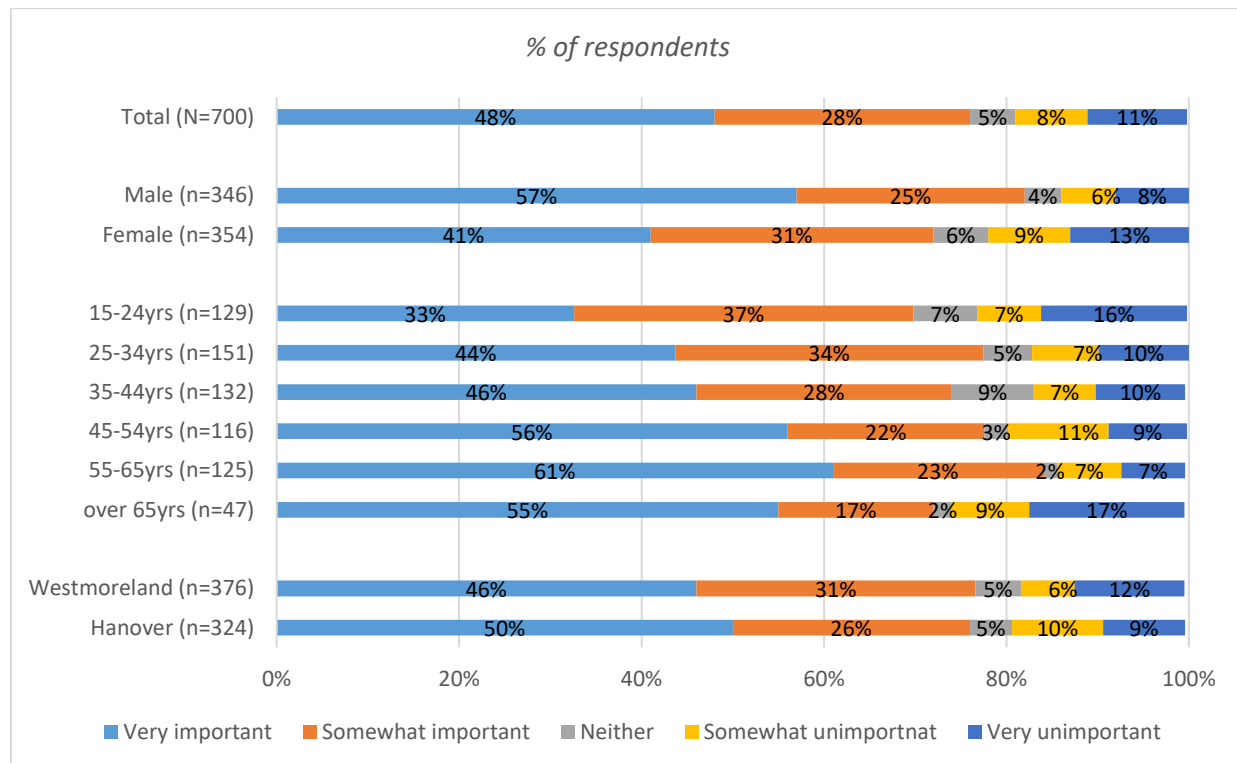
Support for the environment was further evident in the majority who endorsed statements reflecting an appreciation for the delicate balance of nature and that human beings are causing harm. Specifically, 72% endorsed both of the following statements *“the balance of nature is very delicate and easily upset”* (strongly agree/agree) and *“humans are severely abusing the environment”* (strongly agree/agree.)

As expected, concern for the environment exists alongside an appreciation for the need for economic success. While the vast majority (79.5%) supports the view that *“Humans do NOT have the right to damage the environment, just to get greater economic growth”* a similar proportion (79.9%) endorsed the view that *“In order to protect the environment we need economic growth”*. Thus there is an appreciation that economic success is important and necessary to achieve environmental protection, although economic success no matter what the environmental cost is not supported. (Table 12)



**Figure 18: Extent to which respondents agreed with the following statements**

This pro-environmental attitude was further evident in the fact that the majority (76%) indicated that the wetlands were very important/somewhat important. Males (82%) were more likely to emphasize the importance of the wetlands as being very important/somewhat important, than their female counterparts (72%). Top reasons cited for the very important/somewhat important nature of the wetlands were “Provide food (fish)” (23.8%), “Water is available for farming/we farm in the area” (23.0%) and “It is needed to preserve the coastline and wild life habitats” (19.3%). (Figure 19 & Table 11)



**Figure 19: Importance of the Wetlands by Demographics**

**Table 10: Top Reasons the Wetlands Very Important/Somewhat Important**

	(n=534) %
Provide food (fish)	23.8
Water is available for farming/we farm in the area	23.0
It is needed to preserve the coastline and wild life habitats	19.3
Provides water for domestic and farming purposes	7.5
Provides fresh air/keeps the environment	7.1
Home for many wildlife animals	5.2
It helps prevent soil erosion	4.5
Tourist attraction	3.9
It helps with global changes in the environment	3.6
It helps to provide employment	3.4
Don't know	2.4
No answer	33.1

### Effects of Degraded Wetland on the Environment

At least 7 in 10 respondents strongly agree/agree that degrading wetlands would have an effect on the environment. Degrading (damaging) wetlands was endorsed as being likely to lead to the loss of important wild plants and wild animals (90%), a reduction in the income people could make from farming/fishing and tourism (85.6%), increased chances of water bodies becoming dirty with fine sand or clay (80%) and possibly lead to loss of life and property (78.9%). (Table 12)



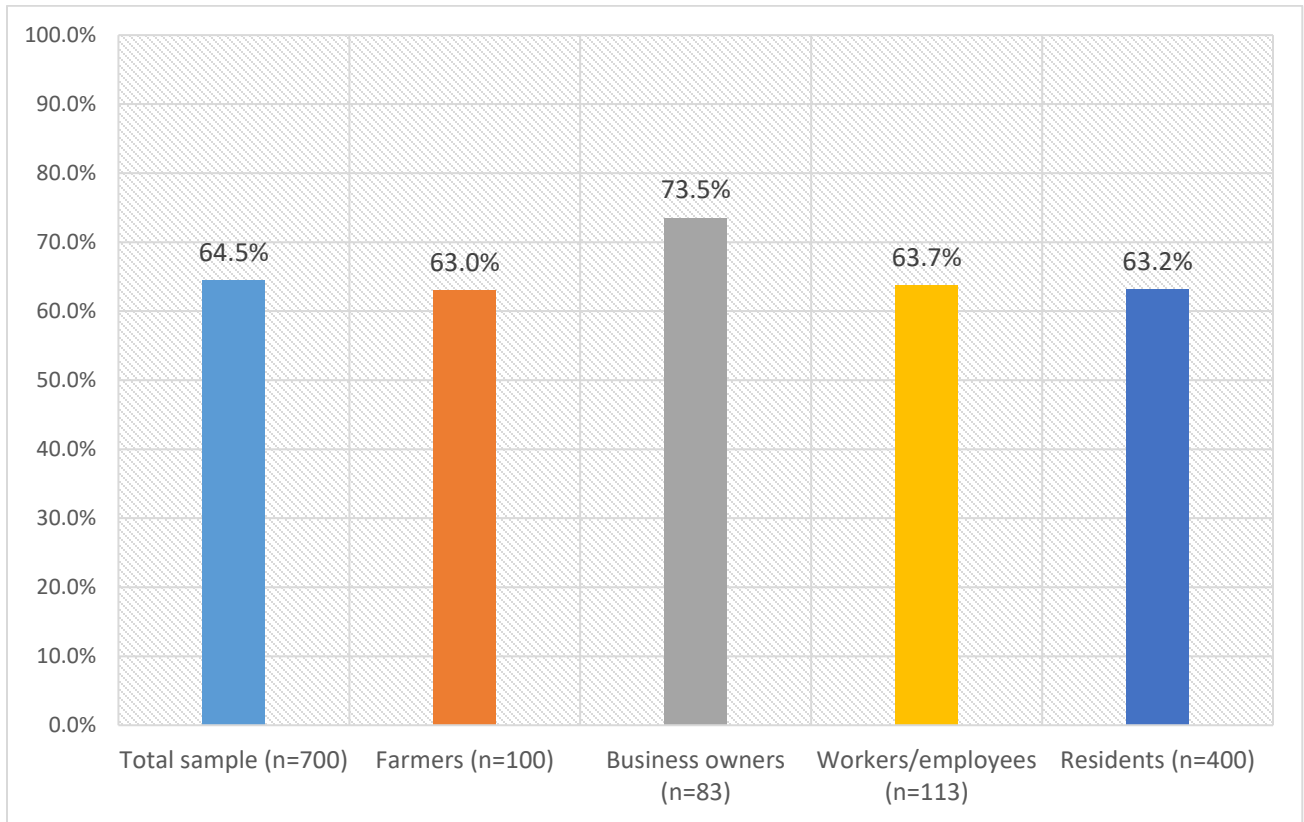
**Table 11: Effects of Degrading Wetland on Environment**

	% of respondents (N=700)				
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Degrading (damaging) wetlands can lead to loss of important wild plants and wild animals.	44.7	45.3	4.0	4.7	1.3
Degrading (damaging) wetlands reduce how much income people can make from farming/fishing and tourism.	37.0	48.6	6.6	6.4	1.4
Degrading (damaging) wetlands increases the chances of rivers/ reservoirs /ponds becoming dirty with fine sand and clay	33.3	46.7	9.0	9.6	1.4
Degrading (damaging) wetlands can lead to loss of life and property	32.9	46.0	7.9	11.3	2.0

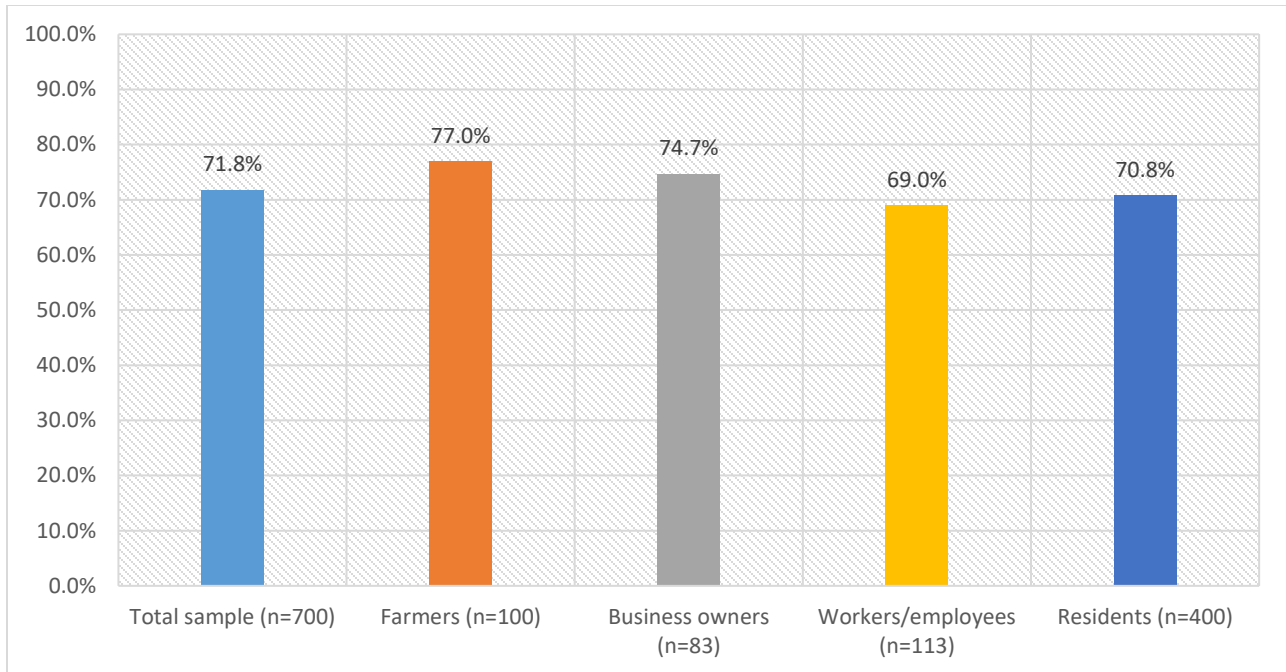
### Attitudes to Conservation

The Negril EPA's contribution to food, home for wildlife and prevention of erosion were given high ratings by the majority as extremely important/important. Overall, the wetlands functioning as a resource provider was most endorsed as a motivator for protecting the area with 71.8% of respondents endorsing this. The hydrological functions were the next most important motivator for conservation with approximately two-thirds (64.5%) endorsing all related statements. Most also endorsed the ecosystem functions of the wetlands as a motivator for conservation with 58% agreeing with all related statements. (Figures 20-22)

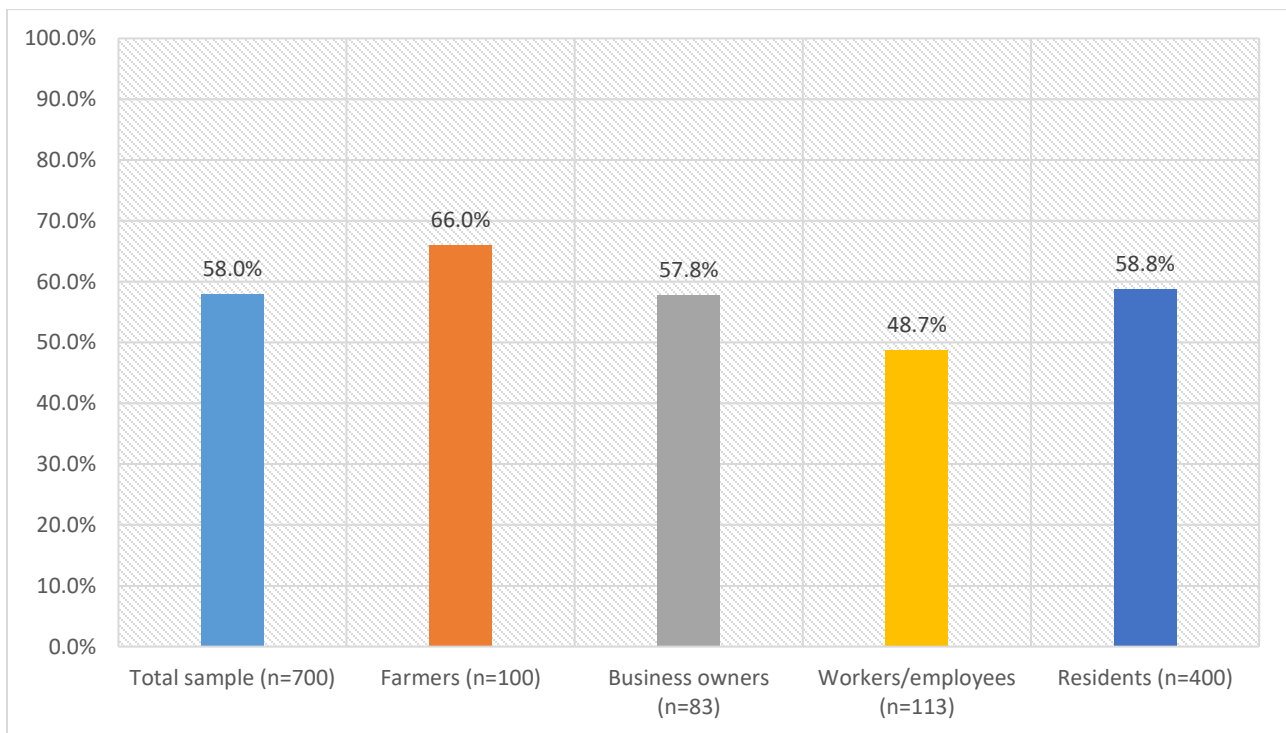
The hydrological function of the wetlands ranked highest as being most important was "the roots of mangroves hold soil firmly to prevent erosion by waves, rain and high tides" (90%). The wetlands' provision of resources which were most important were "is important for maintaining the fish stock of the area" (92.5%), "allow wild animals to feed, and reproduce in a protected and safe area so they can increase in numbers" (91.6%) and "is important for the variety of wild animal and wild plants in the area" (90.9%). While the ecological function which was rated as being most important were "provide a home for and support the survival of the unique wild plants and wild animals of the area" (91.2%). (Table 13)



**Figure 20: Level of Importance of Hydrological Functions of Negril EPA**



**Figure 21: Level of Importance of Provision of Resources Functions of Negril EPA**

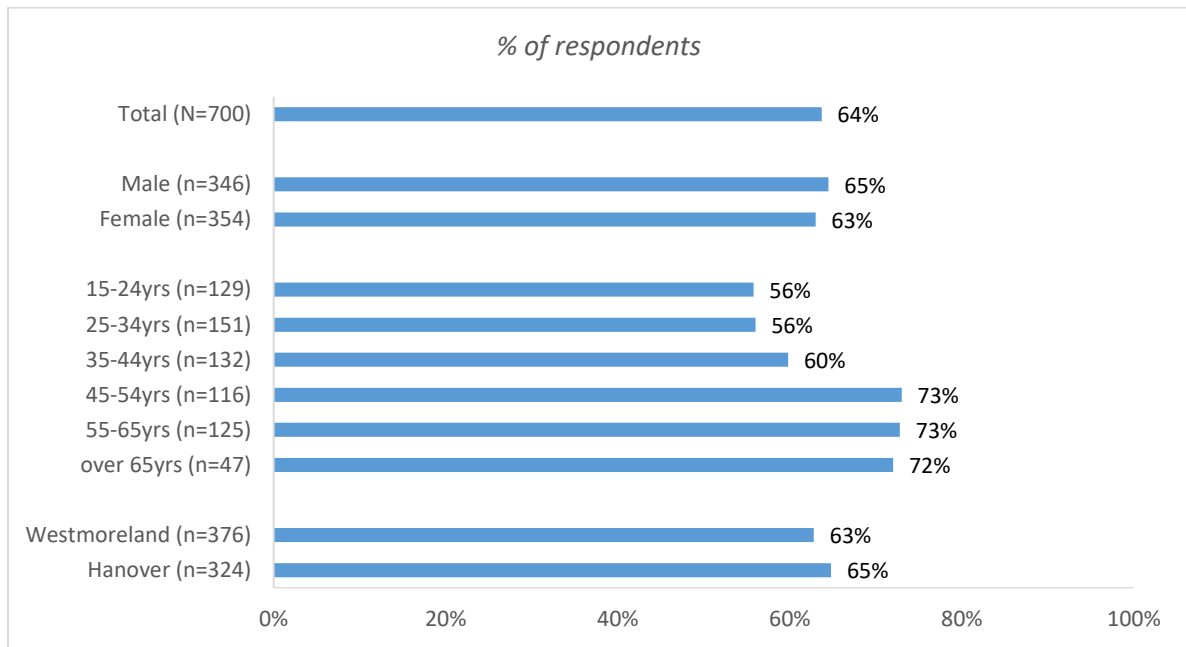


**Figure 22: Level of Importance of Provision of Ecosystem Functions of Negril EPA**

**Table 12: Level of Importance of the functions provided by The Negril EPA**

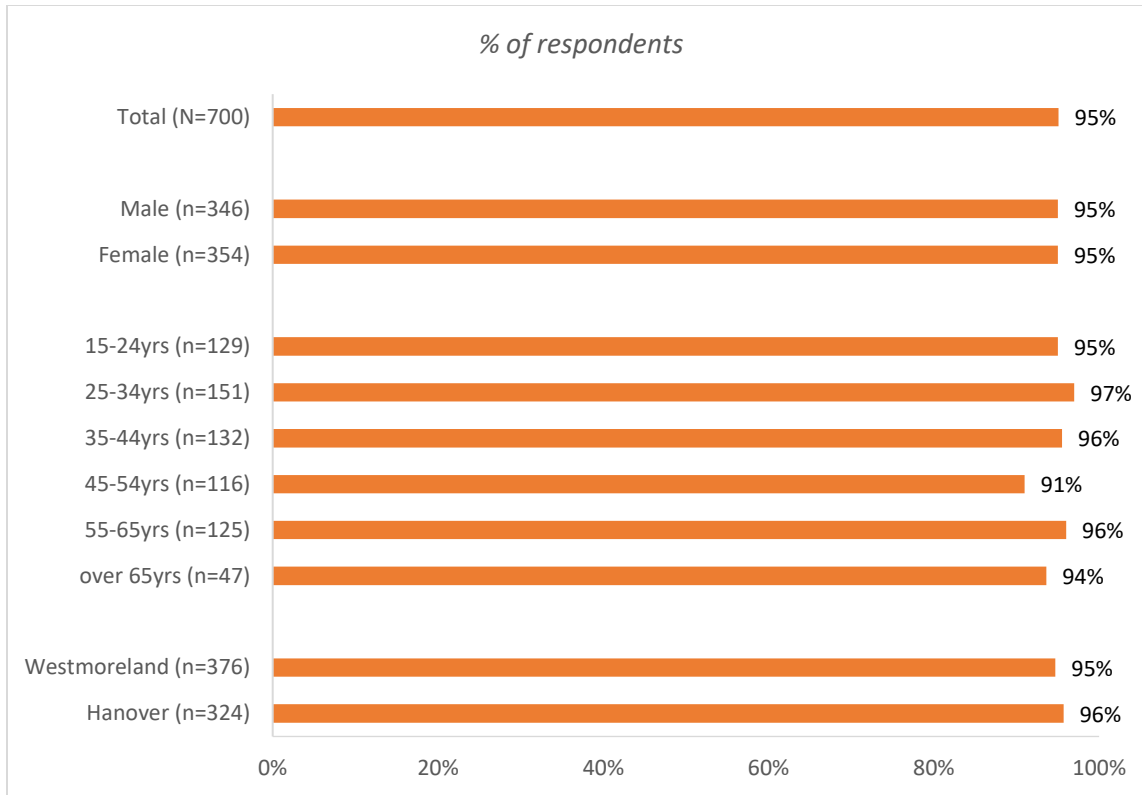
	% of respondents (N=700)					
	Extremely Important	Important	Neither	Not Important	Not at all Important	Don't know
<b>HYDROLOGICAL FUNCTIONS</b>						
Helps protect areas in Negril EPA from the full impact of storms.	43.4	44.0	3.6	4.0	2.0	3.0
Helps protect areas in Negril EPA from flooding.	42.6	43.3	3.4	4.4	3.9	2.4
Helps protect areas in Negril EPA from beach erosion.	40.4	46.0	2.9	4.4	1.3	5.0
Prevents high tides from destroying the coastline and act as a buffer against strong winds.	46.3	38.6	2.4	4.6	2.1	6.0
Improves water quality by filtering water passing through it to the sea	41.9	41.4	2.7	5.9	2.3	5.9
The roots of mangroves hold soil firmly to prevent erosion by waves, rain and high tides.	48.1	41.9	1.6	2.4	1.1	4.9
<b>PROVISION OF RESOURCES</b>						
Allows wild animals to feed, and reproduce in a protected and safe area so they can increase in numbers.	50.9	40.7	1.9	2.9	0.9	2.9
Is important for maintaining the fish stock of the area.	47.9	44.6	2.0	2.4	0.6	2.6
Is important for the variety of wild animal and wild plants in the area	44.0	46.9	1.7	5.1	0.0	2.3
Provides a beautiful natural appearance/ view in the area.	40.9	46.0	3.6	5.3	2.4	1.9
Provides job opportunities e.g. Fishermen, Divers etc.	40.9	44.9	3.0	5.0	2.7	3.6
<b>ECOSYSTEM FUNCTIONS</b>						
Provides a home for and support the survival of the unique wild plants and wild animals of the area.	47.6	43.6	1.9	3.7	1.3	2.0
Removes and stores carbon dioxide from the atmosphere and so is important to help prevent global warming.	45.7	41.6	3.0	2.7	0.9	6.1
Provides activities for fun and pleasure	25.3	43.9	4.1	13.0	6.4	7.3
Provides recreational activities linked to tourism.	36.1	46.7	3.1	5.6	3.6	4.9
Provides sights for visitors who come to the country annually to view, which in turn generates income for the country.	42.4	44.1	3.7	3.7	3.0	3.0
Improve the overall beauty of the area	38.0	47.7	3.3	6.0	2.3	2.7

The majority (64%) indicated that they had enough information on how they could possibly help to protect the wetlands, The Negril Great Morass. Interestingly, this opinion was found to increase with age as the older cohorts were significantly more likely to indicate that they had enough information than their younger counterparts. (Figure 23) This possibly coincides with the older cohort’s higher awareness and recall of the wetlands and The Great Morass.



**Figure 23: Have enough information on actions you could possibly take to help protect the wetland (The Negril Great Morass) By Demographics**

Nevertheless, the majority were not averse to having information on how to protect the wetlands, The Negril Great Morass. This is so as 95%, indicated that they thought it was necessary to have information on how to protect same. (Figure 24)



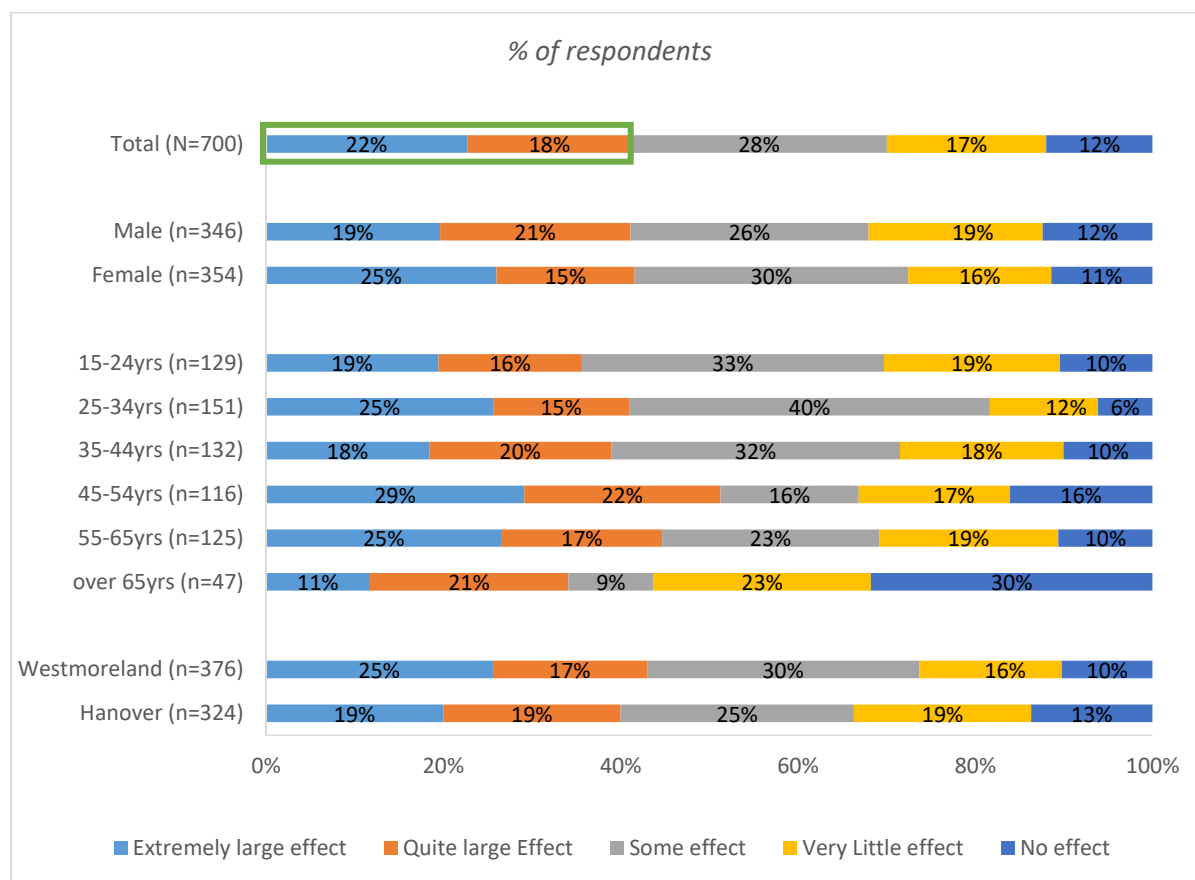
**Figure 24: Necessary to have information on how you could possibly help to protect the wetland (The Negril Great Morass)**

Top reasons cited as why it was necessary to have information were “to help us care for/protect the environment” (46.2%) and “to educate myself and others to care and protect the wetland” (21.5%). (Table 14) Subsequent to this, just under a half (40%) noted that they were of the impression that they could have an extremely/quite large effect on protecting the environment. (Figure 25)

**Table 13: Reasons it is necessary to have information on how to protect the wetland (The Negril Great Morass)**

	% of respondents (n=666)
To help us care for/protect the environment	46.2
To educate myself and others to care and protect the wetland	21.5
No answer	30.3
Other	3.3
Don't know	1.5

\*Base= those who think it is necessary to have information on how one could possibly help to protect the environment/ natural surroundings/ nature



**Figure 25: How Much Of An Effect Do You Think Individuals Such As Yourself Can Have On Protecting The Wetland? By Demographics**

At least 6 in 10 respondents strongly agree/agree with all 10 statements relating to the impact that the state of the environment and wetlands had on life, quality of water, economic development and income generation. (Table 15)

The older age cohort was significantly more likely to endorse that it “is my personal responsibility to protect the wetland” and “my actions have an impact on the wetland” than the younger age cohort. Likewise farmers and business owners were more likely to endorse that “protecting the environment influences the amount of money the country earns (income generation)” than residents and employees.

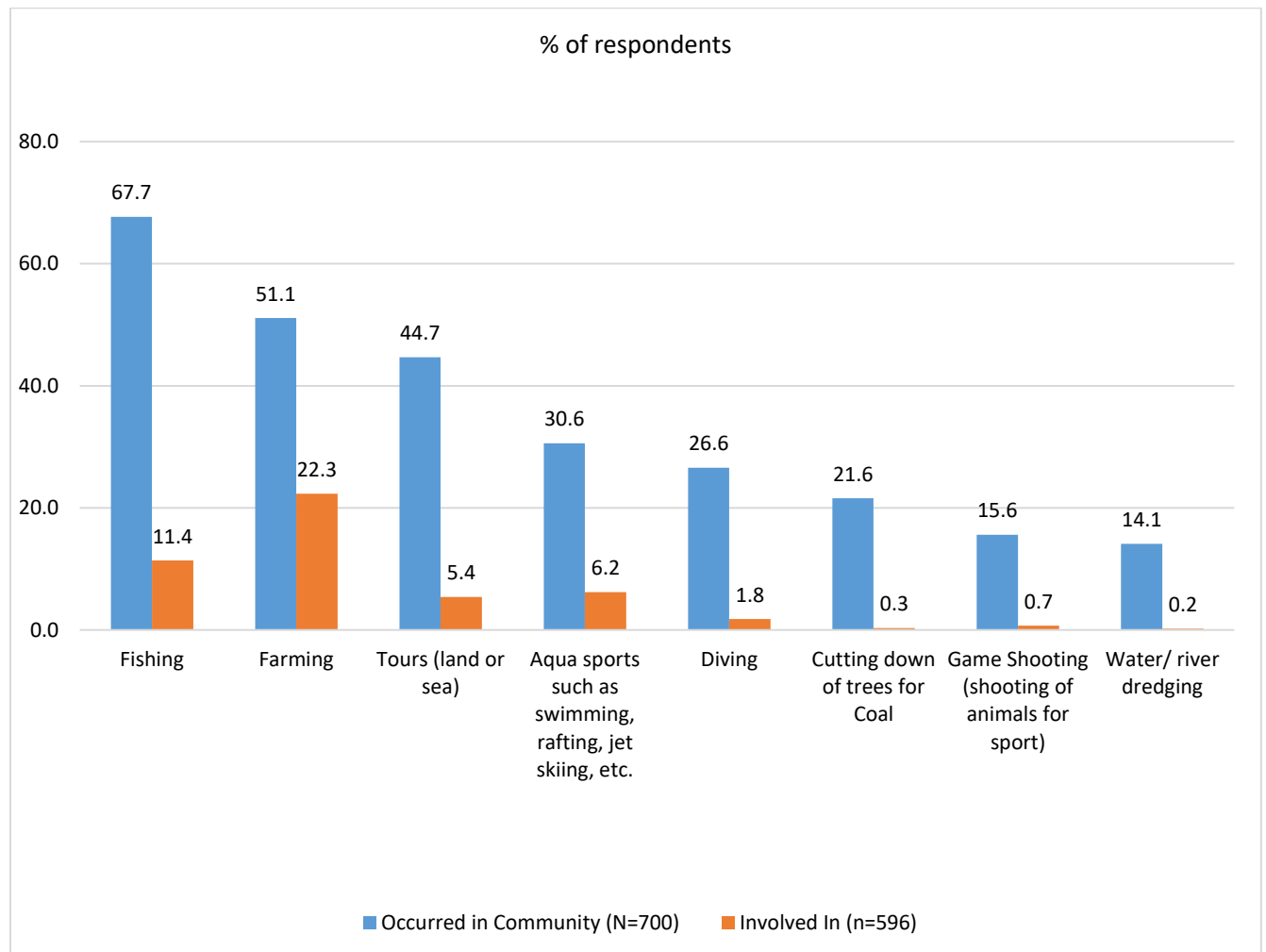
**Table 14: Extent to Which You Agree With the Following Statements: Top 2 Box (Strongly Agree/Agree)**

	% of respondents (N=700)				
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Good water quality is important for economic development	53.9	44.4	0.4	0.4	0.9
The quality of life in my community depends on good environmental practice(s)	47.1	48.7	1.9	1.9	0.4
A healthy wetland is important for economic development	44.9	47.6	3.9	3.0	0.7
It is my personal responsibility to protect water quality	39.3	43.9	4.4	9.1	3.3
My actions have an impact on water quality	38.4	46.1	4.4	8.4	2.6
Protecting the environment influences the amount of money the country earns (income generation)	37.6	45.6	8.3	7.3	1.3
The state of the wetland is important to my life	36.3	47.1	6.7	7.6	2.3
My actions have an impact on the wetland	33.1	44.1	6.6	12.9	3.3
It is my personal responsibility to protect the wetland	31.4	45.4	6.0	12.6	4.6
Protecting the environment influences the amount of money I earn (income generation)	29.0	35.6	11.7	19.4	4.3



### Section 3: Farming, Conservation and Environmental Stewardship Practices

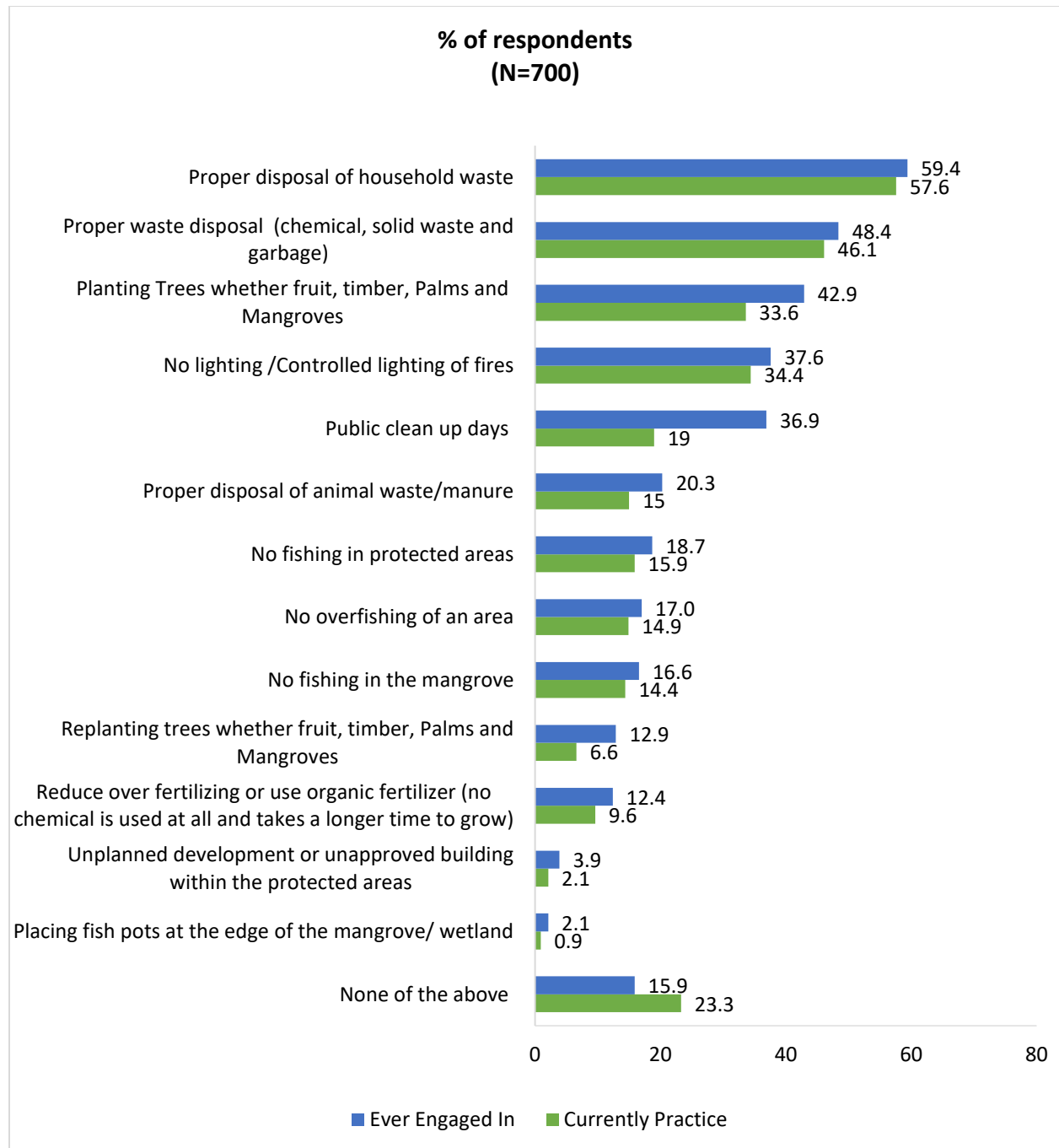
In order to understand the relationship between the Negril Environmental Protection Area and those who depend on it, the activities supported by the area must be known. Respondents generally noted that the area supported a variety of human activities. Those most commonly observed were fishing (67.7%), farming (51.1%) and tours whether on land or sea (44.7%). While these were the activities observed, respondents participating in the survey were personally involved in farming (22.3%) and fishing (11.4%). (Figure 26)



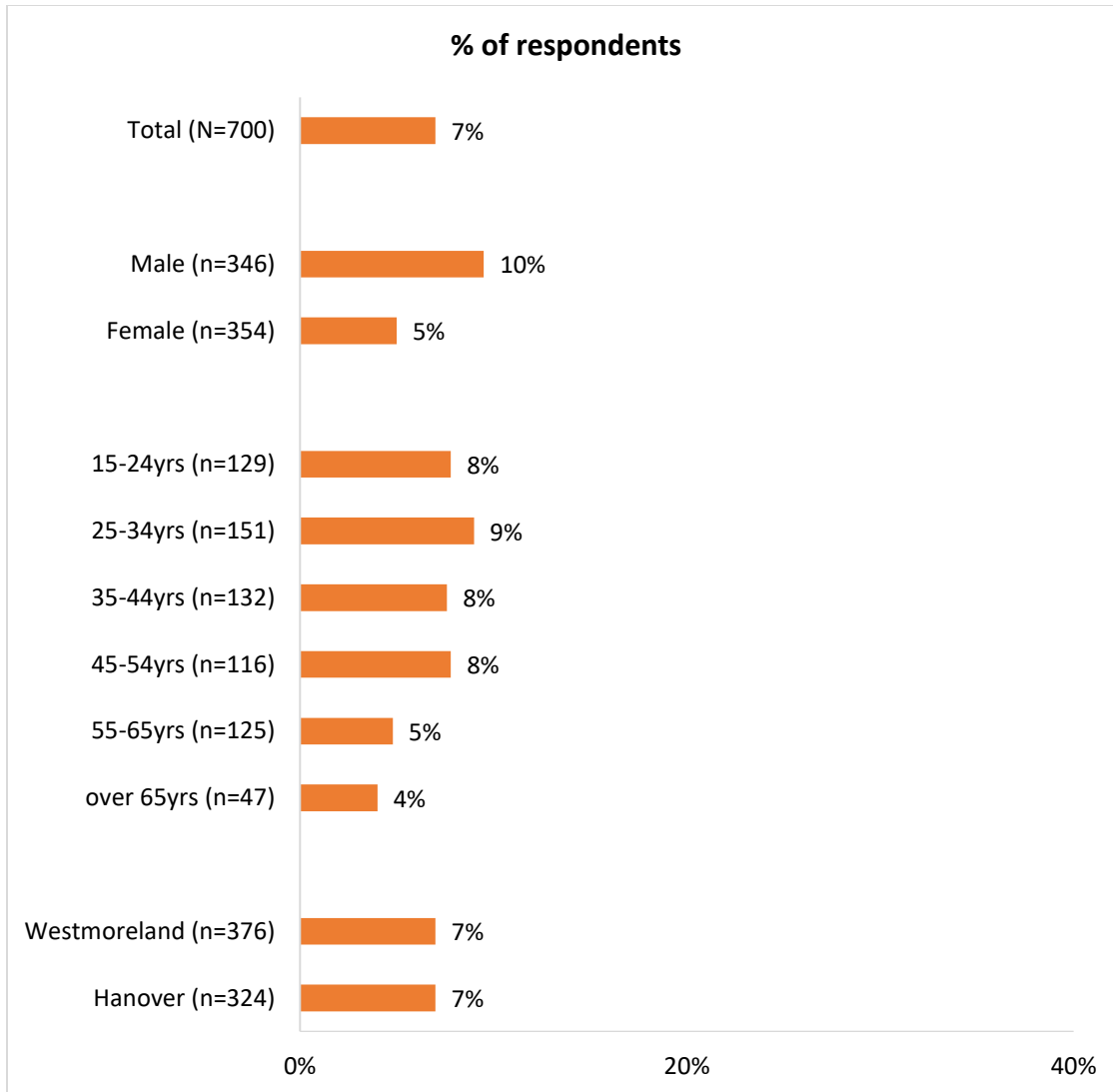
**Figure 26: Activities Reported as Occurring in the Community and Those Respondents Report Being Directly Involved in**

Overall, most respondents (84.1%) reported having engaged in at least one environmentally protective practice at least once in their life. Most respondents (76.7%) were also currently engaged in at least one such practice. The most common practices ever and currently engaged in were proper waste disposal of household waste (59.4% ever vs 57.6% currently) and proper waste disposal in general (48.4% ever vs 46.1% currently). Although, many (42.9%) reported having planted trees at least once in their life (42.9%), it was a third (33.6%) who reported current engagement in tree planting. More than a third had also participated in public clean up days at least once (36.9%) although fewer (19%) reported it as a current activity. *(Figure 27)*

A few respondents (7%) reported having participated in environmental workshops. Males (10%) were twice as likely as females (5%) to report having participated in environmental workshops. *(Figure 28)*



**Figure 27: Activities Ever Engaged in vs. Currently Practiced in past 12 months**



**Figure 28: Participated in Any Environmental Workshops in the Past 12 Months (P12M) By Demographics**

## Section 4: Awareness of Environmental Agencies

Just under a half (45.1%) of participants mentioned NEPA as a company/organization responsible for environment management in the community/Jamaica. Many (42.3%) noted that they were unaware of any such organization. (Table 16)

**Table 15: Companies/Organizations Responsible For Environmental Management in Community/Jamaica: Unprompted Response by Demographics**

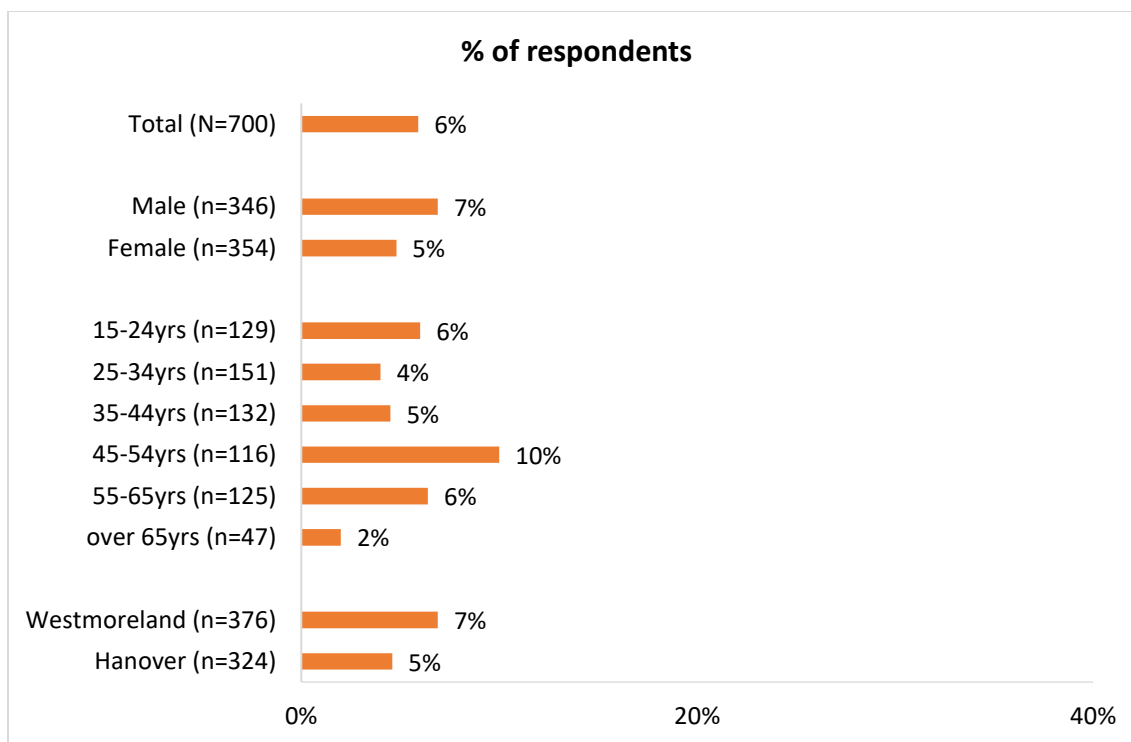
	% of respondents							
	Hanover (n=324)	Westmore land (n=376)		Farmers (n=100)	Business Owners (n=83)	Employees (n=113)	Residents (n=400)	Total (N=700)
NEPA	40.1	49.5		33.0	57.8	59.3	42.0	45.1
UDC	8.3	2.9		13.0	3.6	0.9	5.2	5.4
RADA	2.2	2.4		4.0	1.2	1.8	2.2	2.3
NEPT	0.9	2.9		0.0	3.6	1.8	2.2	2.0
Negril Chamber of Commerce	1.2	1.9		0.0	2.4	0.9	2.0	1.6
SDC	0.9	0.0		0.0	0.0	0.0	0.8	0.4
WRA	0.6	0.0		0.0	1.2	0.9	0.0	0.3
Don't know	45.7	39.4		48.0	32.5	35.4	44.2	42.3

Just over a third (38.7%) stated that The National Environmental Planning Agency “protect the environment/natural resources such as wildlife, wetlands, beaches, mangroves”. (Table 17)

**Table 16: Top Responses for the Function of NEPA: Unprompted Response by Demographics**

	% of respondents							
	Hanover (n=324)	Westm oreland (n=376)		Farmers (n=100)	Business Owners (n=83)	Employees (n=113)	Residents (n=400)	Total (N=700)
To protect the environment/natural resources such as wildlife, wetlands, beaches, mangroves	36.4	40.7		32.0	42.2	36.3	40.2	38.7
To manage/care for/preserve the environment	13.9	17.3		6.0	24.1	15.9	16.5	15.7
Clean up the environment	8.6	10.6		3.0	9.6	9.7	11.5	9.7
Approve/monitor the development of the environment	2.5	3.5		1.0	3.6	2.7	3.5	3.0
Educate persons on how to protect the environment	2.2	2.7		1.0	3.6	2.7	3.5	2.4
Enforce environmental laws	3.1	1.9		0.0	10.8	3.5	1.0	2.4
Don't know	40.4	27.9		56.0	15.7	34.5	31.5	33.7

Six percent (6 %) of the participants indicated that they were involved in a community based organization. Those 45-54y (10%) were most likely to be involved in a community based organization. (Figure 29) Church Youth Group/Police Youth Club/Community Youth Club were the community based organization type most commonly given as being involved in (24.3%). Others gave the names of specific organizations they were involved in. (Table 18)



**Figure 29: Involvement in a Community Based Organization by Demographics**

**Table 17: List of Community Based Organizations Involved in/ a Part of**

	% of respondents (n=41)
<b>Church Youth Group/Police Youth Club/Community Youth Club</b>	24.3
<b>White Hall Community Association</b>	8.1
<b>School’s Chairman Board</b>	8.1
<b>Sports/Football Club</b>	8.1
<b>Farmers Club</b>	8.1
<b>Kiwanis Club of Negril</b>	5.4
<b>Negril Rotary Club</b>	5.4
<b>Jamaica Agricultural Society</b>	2.7
<b>Negril Chamber of Commerce</b>	2.7
<b>Rural Agricultural Development Authority</b>	2.7
<b>Negril Education Environment Trust</b>	2.7
<b>FIWI Children</b>	2.7
<b>Grotto Benevolent Society</b>	2.7
<b>Jamaica Combined Cadet Force</b>	2.7
<b>Sandals Environmental Clean Up</b>	2.7
<b>Green Island Fisherfolk Cooperative</b>	2.7

## Section 5: Attitude to Funerals

Planning for the Deceased in Jamaica (February 5, 2020), a project undertaken by NEPA's Project Planning Monitoring Evaluation and Research and Spatial Planning Division was done with the following objectives in mind to:

- Highlight the land use and environmental impact of current methods of laying the deceased to rest in Jamaica;
- Discuss sustainable management and alternative options for laying the deceased to rest in Jamaica
- Obtain first-hand information from citizens living in the Cornwall County on the land use challenges they face laying their loved ones to rest.

Planning for the deceased on a national level is important as there is increased competition for land use, limited cemetery space and threats of diseases and underground water pollution. Since the IWEco study was conducted within the parishes of interest under the scope of the Planning for the Deceased in Jamaica project, this section was included to ascertain a comprehensive understanding of the population's attitude towards funeral and burial. Further to this, Hanover and Westmoreland in particular are categorised by the presence of hotel development and other land uses and presence of wetlands not suitable for burial, subsequently resulting in this area being a highly distressed area (NEPA, February 5 2020). As such, it becomes highly critical to implement alternative measures for land burial. Below details the findings of residents of The Negril EPA's attitude towards funeral and burial.

Almost a half of participants (49.8%) noted that they were completely/very/ relatively comfortable with talking about death. It is almost three quarters (74.1%) who indicated that it was very important/important to have a funeral plan in place. *(Figures 30 & 31)*

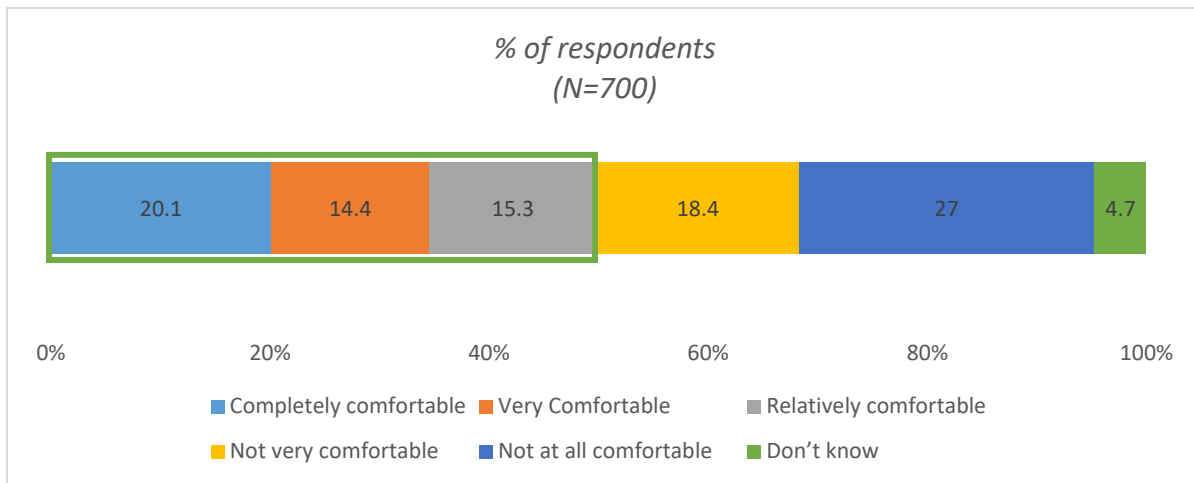
This however, did not transcend into plans made, as more than a half (64.3%) indicated that they had not made plans concerning what would be done with their bodies after death. *(Figure 32)*



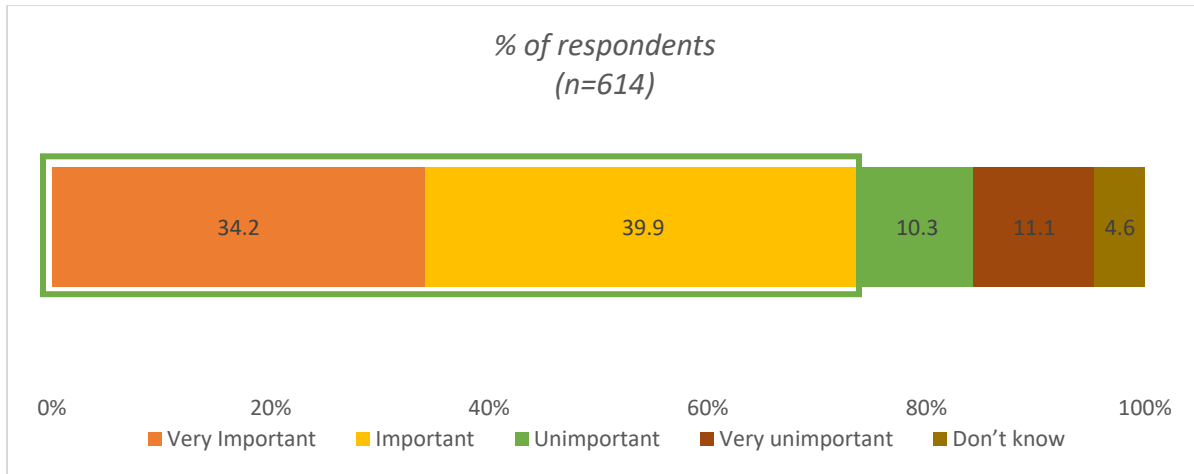
Ground burial emerged on top as the preferred method of laying family member (78%) and self (69%) to rest. (Figure 33)

The majority (67%) noted that they would want to be buried in a private/family cemetery. (Figure 34)

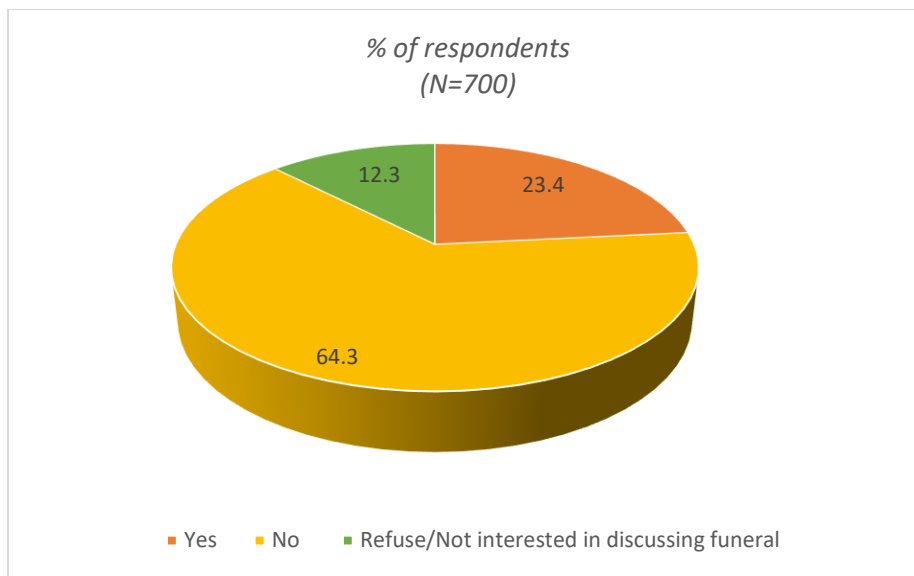
Just over a quarter (26%) preferred a head stone, while 24% desired an above ground vault for themselves. However, the majority indicated that above ground vault (34%) and ledger grave markers (29%) were currently being utilized by close family member. (Figure 35)



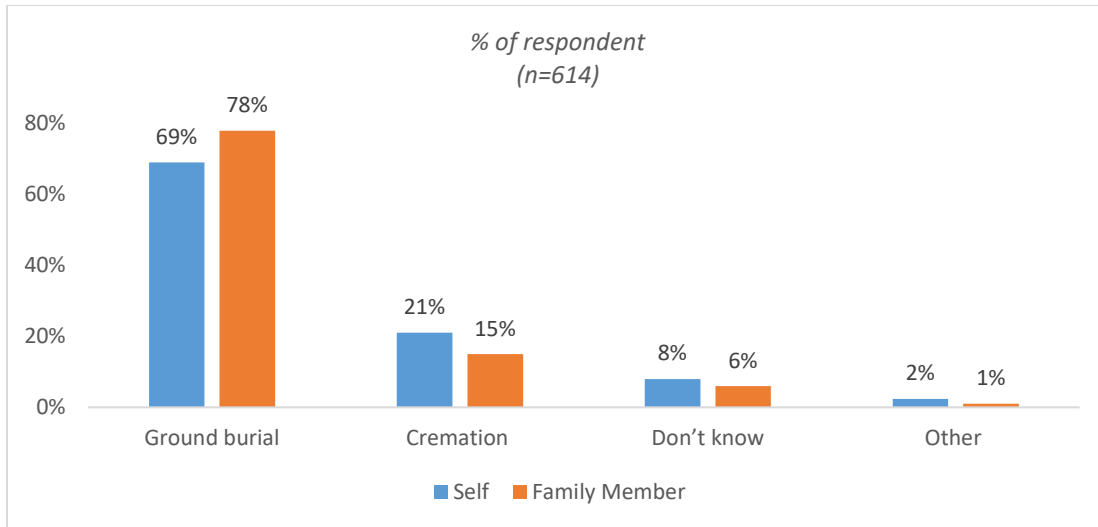
**Figure 30: Level of Comfort with talking about Death**



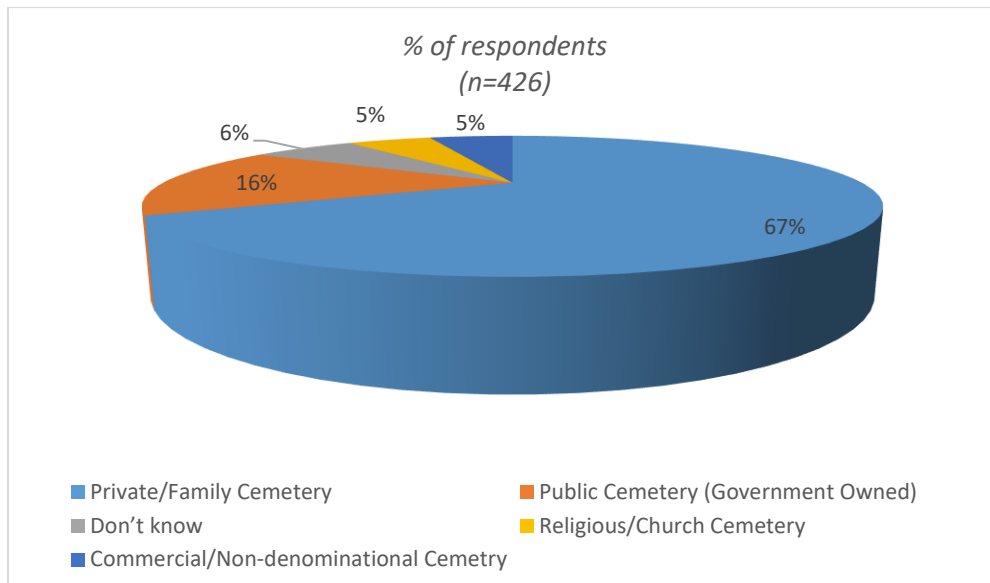
**Figure 31: Level of Importance of Having a Funeral Plan**



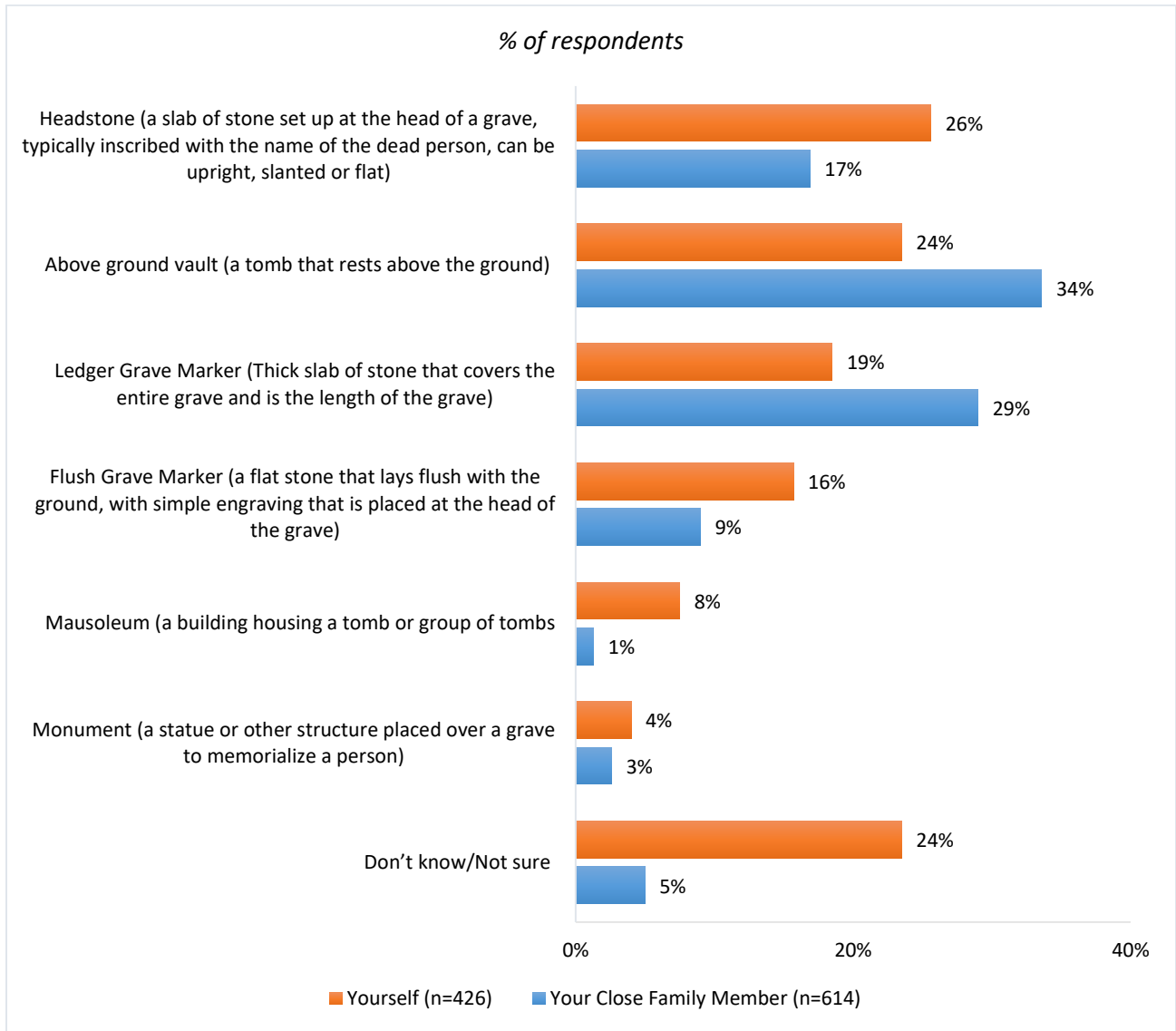
**Figure 32: Do you have a funeral plan/plan for what happens to your body when you die?**



**Figure 33: What method of Laying to Rest Would You Consider for Yourself vs. Close Family Member**



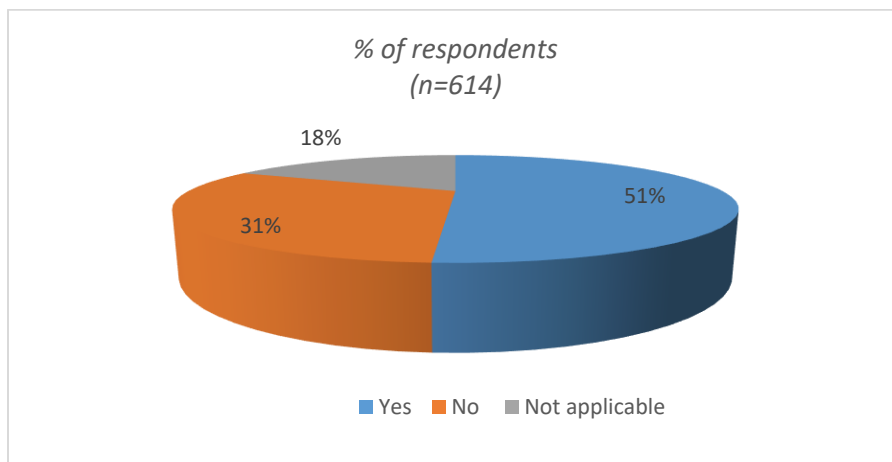
**Figure 34: Where would you want to be buried?**



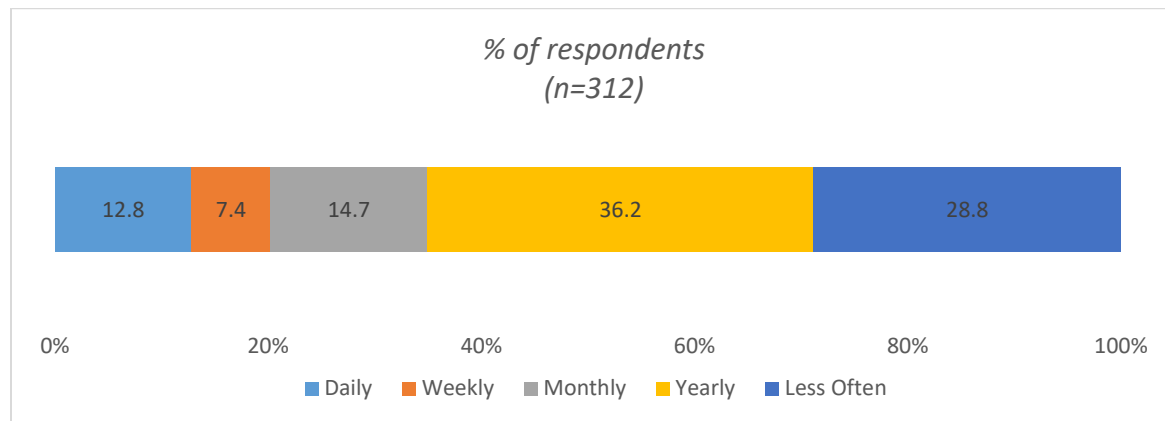
**Figure 35: Burial Accessories Preferred vs. Current Burial Accessories Utilized**

A half of respondents (51%) visited their loved one’s grave. More than a third (36.2%) noted that they visit their loved ones grave yearly and just less than a third (28.8%) indicated less often. (Figure 36 & 37)

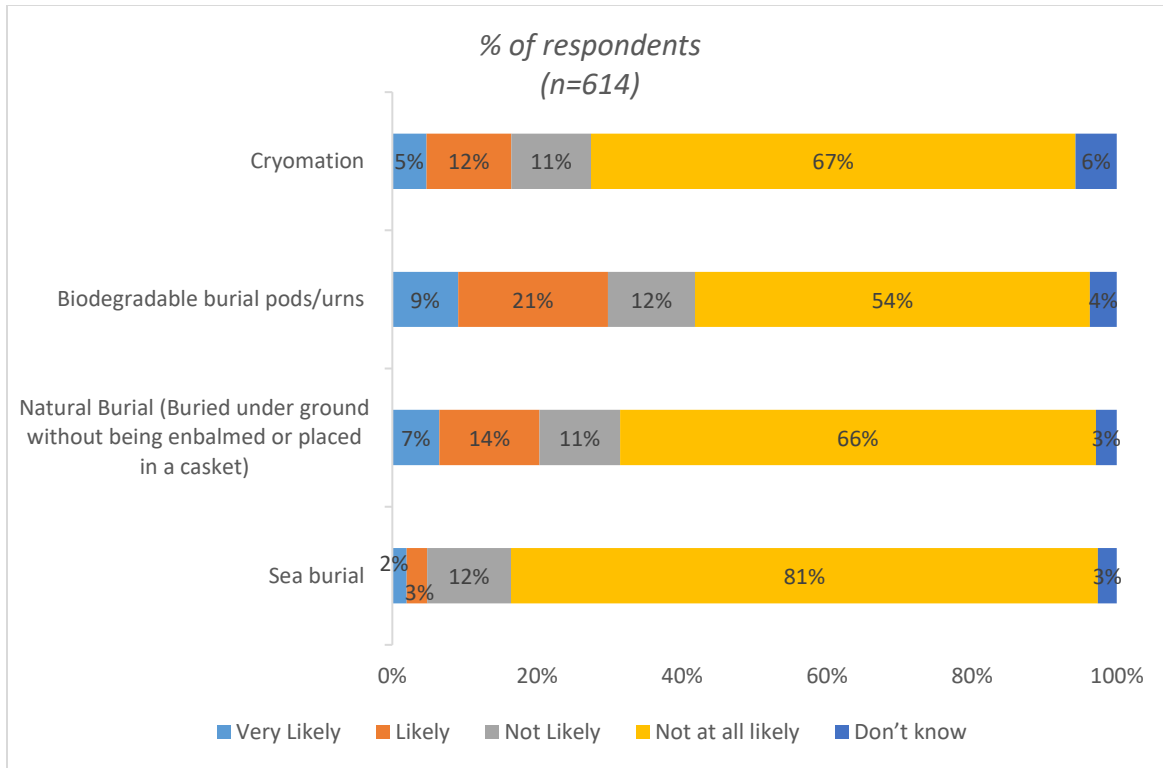
Biodegradable burial pods/urns (30%) were rated as being very likely/likely alternative to burial ground by the majority. Sea burial was the most unlikely alternative as 8 in 10 (81%) rated this burial option as not at all likely. (Figure 38)



**Figure 36: Do you visit your loved one’s grave?**



**Figure 37: Frequency of Visit**



**Figure 38: Alternatives to Burial Ground**

## Section 6: Relationship between Knowledge, Awareness and Engagement

### Current Engagement in Conservation Practices

To determine the knowledge or attitudes related to current engagement in conservation practices, a Pearson's Correlation Test was done. The results from the Pearson's Correlation test indicated that encouraging conservation practices could be achieved through promoting the awareness of the benefits of the wetlands, increasing awareness of the impact of a degrading wetland, increasing knowledge of those practices that could potentially harm the wetlands and influencing the stakeholder's perception that it is their personal responsibility to protect the wetlands and the quality of water.

The results showed that there was a significant positive association between current engagement in conservation practices and knowledge of the hydrological, provisional and ecosystem benefits of the wetlands along with willingness to engage in conservation practices, awareness of degrading wetland impact and knowledge of the threats to wetlands. (Table 19)

**Table 18: Exploring Associations between Current Engagement in Conservation Practices and Knowledge of Wetland Functions, Threats and Willingness to Engage in Conservation Practices**

<i>Pearson's Correlation Results (Base=700)</i>	r	P
Wetland Benefits: Hydrological Function	.249	<.001
Wetland Benefit: Provision of Resources	.251	<.001
Wetland Benefit: Ecosystem Functions	.231	<.001
Willingness to Engage in Conservation	.277	<.001
Aware of Degrading Wetland Impact	.254	<.001
Knowledge of Threats to Wetlands	.531	<.001

Further to this, there were significant associations between current engagements in conservation practices and being a farmer, perception of personal responsibility to water quality and wetland protection. There was also a significant association between current engagement in conservation practices and the perception of personal actions impacting the wetland and water quality. (Table 20)

**Table 19: Exploring Associations between Current Engagement in Conservation Practices and Perceived Impact of Personal Responsibility**

<i>Pearson's Correlation Results (Base=700)</i>	r	P
Being a farmer	.190	<.001
It is my personal responsibility to protect water quality	.315	<.001
It is my personal responsibility to protect the wetland	.295	<.001
My actions have an impact on water quality	.224	<.001
My actions have an impact on the wetland	.252	<.001

Further analysis also revealed that current engagement in conservation practices had a positive significant association to the hydrological functions, resource provision and ecological functions being motivators for conservation. Specifically, higher engagement in conservation activities was associated with greater endorsement of the hydrological resource, provision and ecosystem functions being important reasons to protect wetlands such as the Negril Great Morass. (Table 21)

**Table 20: Exploring Associations between Current Engagement in Conservation Practices and Conservation Motivation**

<i>Pearson's Correlation Results (Base=700)</i>	r	P
Wetland important reasons to protect: Hydrological Function	.347	<.001
Wetland important reasons to protect: Provision of Resources	.298	<.001
Wetland important reasons to protect: Ecosystem Functions	.296	<.001



### **Willingness to Engage In Conservation**

Willingness to engage in conservation showed moderate and significant association to the conservation motivations of provision of resources, ecosystem functions and hydrological functions. There was also a moderate association between willingness to engage in conservation and awareness of the impact of degrading wetlands. (Table 22)

**Table 21: Exploring Associations between Willingness to Engage in Conservation Practices and Knowledge of Wetland Functions, Threats and Impact of a Degrading Wetland**

<i>Pearson's Correlation Results (Base=700)</i>	r	P
Wetland Benefit: Hydrological Function	.464	<.001
Wetland Benefit: Provision of Resources	.516	<.001
Wetland Benefit: Ecosystem Functions	.521	<.001
Aware of Degrading Wetland Impact	.503	<.001
Knowledge of Threats to Wetlands	.269	<.001

Further explorations into the associations between key variables revealed that there was a moderate association between the willingness to engage in conservation practices and the perception of personal responsibility to water quality and wetland protection. Additionally, there was also a moderate association between the willingness to engage in conservation practices and the perception of personal actions impacting the wetland and water quality.

(Table 23)

**Table 22: Exploring Associations between Willingness to Engage in Conservation Practices and Perceived Impact of Personal Responsibility**

<i>Pearson's Correlation Results (Base=700)</i>	r	P
It is my personal responsibility to protect water quality	.462	<.001
It is my personal responsibility to protect the wetland	.465	<.001
My actions have an impact on water quality	.523	<.001
My actions have an impact on the wetland	.539	<.001

Willingness to engage in conservation practices also showed a moderate association to endorsements of the hydrological resource, provision and ecosystem functions being important reasons to protect the Negril Great Morass. (Table 24)

**Table 23: Exploring Associations between Willingness to Engage in Conservation Practices and Conservation Motivation**

<i>Pearson's Correlation Results (Base=700)</i>	r	P
Wetland important reasons to protect: Hydrological Function	.503	<.001
Wetland important reasons to protect: Provision of Resources	.531	<.001
Wetland important reasons to protect: Ecosystem Functions	.570	<.001

## Chapter 5 Discussion

Respondents were generally aware of the environment and were able to correctly identify the elements. This translated to some amount of awareness and understanding of environmental management. Nevertheless, at least a quarter of respondents were unaware of key environmental attributes in relation to wetlands, mangroves and swamps. This suggests that some residents are living, working and doing business in the area, but are not connected to the environment. This was more evident among the younger age cohort in that they were the least aware of the wetlands, the Great Morass and the Great Morass being a protected area. Females were more likely to indicate that the environment was very important to community development than males. Yet males had greater awareness of the wetlands than females. Increased awareness of wetlands and its function among females is imperative to increase appropriate protective environmental behavior. This is true especially in light of the positive attitude to the environment which already exists among this cohort.

The main threats to the wetland were identified as being related to improper waste or garbage disposal. Despite this knowledge, in the qualitative discussions, respondents reported being aware of persons throwing garbage and waste in the mangroves and on empty lands. Such practices could be reduced with proper education and increased appreciation for its negative impact.

Further focus could also be given to the role of wetlands in reducing flooding through its ability to lower surges inland from the coasts. As such it becomes imperative to educate that although flooding is not a severe problem now, there is still impending danger unless appropriate behaviours are implemented and maintained to protect and preserve the wetlands.

Generally, farmers and business owners were more likely to endorse that protection of the environment influences or affects income generation, than were residents and employees. This suggests that those who have a greater connection with and appreciation for the environment, particularly the farmers and business owners, would be more likely to act as environmental

stewards and agents of change. It would be useful to incorporate this sector of the community in public education campaigns and as a catalyst to effect change. This is so as they already have an appreciation for the environment's role in economic growth and stability. However, a note of caution is the perception that water pollution from businesses including hotels and villas is a threat to the environment. Evidence of such inconsistencies need to be addressed by encouraging the business community to take the necessary steps to evaluate and correct operations within their business processes that could possibly harm the environment.

Overall, business owners displayed higher knowledge of the hydrological functions of the wetlands. This may be an result of the direct impact the hydrological functions of wetlands have on business owner's income generation. This higher level of awareness can be used to leverage greater responsibility and action amongst this group to protect and maintain the wetland are. There is also a need to increase awareness of the provision of resources and ecosystem functions of the wetlands among this group of respondents. Farmers displayed highest knowledge of the provision of resources and ecosystem functions of the wetlands. This knowledge could be built on and used as motivators to encourage protection and maintenance of the wetlands. Public education activities should include activities to increase awareness of the hydrological function of the farmers among this group.

The majority is knowledgeable of correct conservational activities. It is important to utilize this knowledge and engage the community in practices driven to that regard such as beach clean-ups, planting trees, whether fruit, palms or mangroves and proper waste disposal. It also becomes crucial to increase awareness of ways to protect the Negril Great Morass and Negril EPA to eradicate any misconceptions present, while promoting appropriate behavior. Education becomes imperative to the protection of the wetlands and environment. This is so as there was a disparity between those who thought it was necessary to have information to protect the Negril Great Morass and those who were of the perception that they had enough information.

Nevertheless, a pro-environmental attitude was evident in the majority. Statements centred on the protection of the environment were endorsed by the majority as being very/somewhat important. It is evident that more should be done to leverage this pro-environmental attitude by increasing awareness and knowledge of the potential effects of a degrading wetland on economic growth and income generation. Further to this, all stakeholders, especially residents and younger age cohorts, should be encouraged to engage in the most appropriate practises.

## Chapter 6 Conclusion and Recommendations

Residents, farmers and business owners displayed some amount of awareness and understanding of the wetlands, mangroves and swamps. However, the older cohorts were more likely to be aware of the Great Morass and Negril Environmental Protection Area than their younger counterparts. Further to this, the older cohorts were significantly more likely to indicate that they had enough information to help protect the Great Morass than the younger cohorts. This has implications for subsequent behaviour as there needs to be increased awareness so as to influence positive attitudes and behaviour towards the wetlands. The younger age cohort was significantly less likely to endorse that it was their personal responsibility to protect the wetland and the impact their actions have on the wetlands. This was supported by the results of the initial qualitative phase which revealed that the environment, its protection and endangerment was not an immediate concern for the younger age cohorts. Crime and the lack of employment opportunities, access to water, proper garbage disposal and housing were immediate concerns for these cohorts. Younger respondents believed that there were a number of injustices which existed in their community. They were of the impression that the government had not done enough to address the concerns of the community.

On the other hand, farmers and business owners were concerned about the environment as it was directly related to their source of livelihood. This was evident in farmers and business owners being more likely to endorse protecting the environment because it influenced income generation.

While improper waste and garbage disposal was seen as the greatest threat to the wetlands, proper waste disposal was practiced by just a third of respondents. Additionally, unplanned development or unapproved building within protected areas was practiced by more than half of respondents. The qualitative phase revealed that squatter settlements were not seen as a problem or a threat to the environment, but were endorsed as a method by which residents sought to address the lack of housing solutions.

## **Recommendation**

- Utilize males and the older age cohort as key influencers: agents of change. They were identified as being more environmentally aware and could be used as the pioneers in their community to influence adherence to environmentally friendly activities.
- Utilize the business community and farmers as key influencers: agents of change. They were identified as being pro-environmental with regards to the harmony that should be maintained between the environment and economic growth. Their view that the environment should not be at a disadvantage for economic gain could be used to push the mandate of greater care for the environment to maintain economic stability.
- Residents were concerned about crime, lack of employment and water and inadequate infrastructure to facilitate proper garbage disposal. It is important to partner with relevant agencies to address the residents' concerns.
- Reinforce the importance of the role of all stakeholders in playing their part to protect the environment.
- Communication campaigns must highlight the negative effects of all practices on the protection of the wetlands and its ultimate effect on life and livelihood.
- Implement strategies to engage youths in increased responsibility for the protection of wetlands by encouraging involvement in environmental management activities, such as beach clean-ups, recycling activities and peer education.
- The majority of respondents were unaware of the function of NEPA. As such it is suggested that necessary activities be done to increase awareness. This was especially true for Hanover residents as they were more likely to have no knowledge of the functions of NEPA.
- The immediate and short term benefits that can be derived from taking care of the environment should be properly communicated to all Negril EPA stakeholders.
- It is suggested that a KAPB study be conducted with the other stakeholders such as tourists who also benefit from the Negril EPA. It is important to understand whether or not their knowledge, attitudes and behaviours have affected the wetlands negatively.

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## Appendices

### Appendix 1

#### Negril Environmental Protection Area (*Negril EPA*) Wetland Knowledge, Attitude, Practice and Behaviour (KAPB) QUESTIONNAIRE - 2020

**Read:** Hello, my name is (**say your name**) and I work for **Hope Caribbean Co. Ltd.**, a marketing research company in Kingston. We are currently conducting a survey on behalf of the **National Environment and Planning Agency (NEPA)**, to find out person's opinions and perception of the environment/nature in your community. We would like to ask you a few questions.

This survey could last up to 30 minutes and your participation is voluntary. Please be assured that all the information you provide will be kept confidential and will only be used for the benefit of this survey. Thank you for your participation.

<b>Name of interviewee:</b>	<b>Date/ Time:</b>
<b>PHONE :</b>	<b>Name of Interviewer:</b>
<b>HOME ADDRESS:</b>	
<b>Parish/Location:</b>	

#### **SECTION 1- Socio-Demographic Information**

##### **S1. Gender**

Male	1
Female	2

##### **S2. How old are you? Age: \_\_\_\_\_ years**

Note to interviewer: Select what age group they fall into

18-24yrs	1
25-34yrs	2
35-44yrs	3
45-54yrs	4
55-65yrs	5
Over 65yrs	8

##### **S3. How many persons live in your household? \_\_\_\_\_**

No. Of Adults \_\_\_\_\_ No. Of Children \_\_\_\_\_

**S4. What is your highest level of Education?**

<input type="checkbox"/> No Schooling	<input type="checkbox"/> Vocational [HEART, NCTVET]
<input type="checkbox"/> All-Age/Primary/Prep School	<input type="checkbox"/> Tertiary [University, College]
<input type="checkbox"/> Secondary/High/Technical School [CXC]	<input type="checkbox"/> Other (Specify)

**S5. What is your Marital Status?**

<input type="checkbox"/> Single	<input type="checkbox"/> Widowed
<input type="checkbox"/> Married	<input type="checkbox"/> Common-Law/ Living with a partner
<input type="checkbox"/> Separated	<input type="checkbox"/> Other (Specify)
<input type="checkbox"/> Divorced	<input type="checkbox"/> Widowed

**S6. What is your current employment status?**

<input type="checkbox"/> Full-Time Employed	<input type="checkbox"/> Unemployed
<input type="checkbox"/> Part-Time Employed	<input type="checkbox"/> Student
<input type="checkbox"/> Self Employed	Retired

**S7. Which of the following best describes your main occupation, which is the primary way through which you earn an income?**

<i>(Farmer)</i> I am a farmer, I grow crops or raise animals which I later sell to earn an income	1
<i>(Hotel owner/ operator/manager)</i> I own, operate or manage a hotel, guest house, villa, etc.	2
<i>(Hotel Employee )</i> I am employed in a hotel, guest house or villa	3
<i>(Other tourist employee (e.g gift shop, etc)</i> I work in a gift shop or other shop where tourists frequently visit	4
<i>(Fisherman)</i> I am a fisher man that means I go sea and catch fish, or other sea animals, which I later sell to earn an income	5
<i>(Water operator)</i> I am employed in the tourist industry in water sports e.g. boat operator, jet ski operator, diving instructor, etc.	6
<i>(Mechanic)</i> I operate a garage where I fix cars, vans, trucks, boats, etc.	7
Other _____ specify <i>Employed in other commercial entity</i>	8

**SECTION 2-General Knowledge and Perception**

**Q1.** What do you consider to be the **three (3)** most serious problems in your community today? (SHOW CARD)

	<b>1<sup>st</sup> Mention</b>	<b>2<sup>nd</sup> Mention</b>	<b>3<sup>rd</sup> Mention</b>
Poverty and hunger	1	1	1
Unemployment	2	2	2
Corruption	3	3	3
Global warming/Climate change	4	4	4
The global economic downturn	5	5	5
Violent crime	6	6	6
Other Crime	7	7	7
Health and disease (Diabetes, HIV/AIDS etc.)	8	8	8
Squatting	9	9	9
Youth dropping out of school	10	10	10
Domestic abuse and Child abuse	11	11	11
Loss of trees and animals	12	12	12
Garbage collection and solid waste management	13	13	13
Sewage treatment and disposal	14	14	14
Lack of Water	15	15	15
Lack of Education	16	16	16
Lack of Healthcare	17	17	17
Other_____	18	18	18

**Q2.** Which of the following things would you associate with the word “Nature/ Natural environment/surroundings”? More than one answer can be provided.

<input type="checkbox"/> Water	<input type="checkbox"/> Houses
<input type="checkbox"/> Trees	<input type="checkbox"/> Roads
<input type="checkbox"/> Sand	<input type="checkbox"/> Factories
<input type="checkbox"/> Air	<input type="checkbox"/> Rain
<input type="checkbox"/> Stones	<input type="checkbox"/> Hills
<input type="checkbox"/> Animals	<input type="checkbox"/> Businesses
<input type="checkbox"/> The sea	<input type="checkbox"/> Beach
<input type="checkbox"/> The mangrove	<input type="checkbox"/> The wetland
<input type="checkbox"/> Fishes	<input type="checkbox"/> Coral and coral reef
<input type="checkbox"/> The people	<input type="checkbox"/> None of the above

**Q3.** When you hear the phrase “environmental management/ protecting nature” what comes to mind? What do you mean by that? (**Probe fully**)


**Q4.** How important is the environment and natural resources to the development of community?

1. Very important   2. Important   3. Little importance   4. Not important

**Q5.** To what extent do you think your community is in danger from any of the following natural disasters?

	Severe Danger	Little Danger	No Danger	Unsure (Do Not read)
a) Flooding	3	2	1	0
b) Landslides/landslips	3	2	1	0
c) Earthquake	3	2	1	0
d) Coastal erosion/ loss of beaches	3	2	1	0
e) Drought/water shortage	3	2	1	0
f) Storms/hurricanes	3	2	1	0
g) Fires	3	2	1	0
h) Declining fish stocks	3	2	1	0
i) Rising sea levels because of global climate change	3	2	1	0

**Q6a.** When you hear the word “wetland” what comes to mind? What do you mean by that? **(Probe fully) [PROMPTED RESPONSE]**


**Q6b.** When you hear the word “mangrove” what comes to mind? What do you mean by that? **(Probe fully) [PROMPTED RESPONSE]**


**Q6c.** When you hear the word “swamp” what comes to mind? What do you mean by that? **(Probe fully) [PROMPTED RESPONSE]**


**Q6d.** Do you know of any wetlands (including mangroves and swamps) in or around Hanover and Westmoreland?                      1. Yes                      2. No **(IF NO SKIP TO Q6h)**

**Q6e.** If Yes: What is it called? \_\_\_\_\_

**Q6f.** If The Negril Great Morass is not mentioned: Have you ever heard of The Negril Great Morass?

1. Yes                      2. No (**IF NO SKIP TO Q6h**)

**Q6g. Is the Negril Great Morass a protected Area?**

1. Yes                      2. No                      3. Don't know

***“The Negril Environmental Protection Area (Negril EPA) is a protected area that extends from Green Island on the north coast to St John’s Point (south of Negril) and inland to Fish River village and Orange Hill. It also includes a marine park extending out to sea.”***

**Q6h.** Have you ever heard of the Negril Environmental Protection Area (Negril EPA)?

1. Yes                      2. No

**Q6i.** Do you live in or operate a business in the Negril EPA?

1. Yes                      2. No

**“Before we continue, I would like to let you know the definition that scientists use to describe wetlands...**

“A wetland is an area of land that is covered or flooded with water either permanently or seasonally. Wetlands can be **freshwater**, **partly salty** (brackish) or **very salty** (saline). Examples of wetlands are mangroves, lagoons, swamp forests, marshes, and bogs.”

*Based on the definition I just read to you ....*

**Q7.** How important is the wetland to life in your community?

- Very important
- Somewhat important
- Neither important nor unimportant
- Somewhat unimportant
- Very unimportant

**Q8.** Why do you say so? What do you mean by that? (**Probe fully**)

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**Q9.** Based on what you know personally, which of the following activities occur in The Negril Great Morass and wider Negril Environmental Protection Area?

**Q10.** Which have you been personally involved in the past 12 months? Please remember this survey is anonymous and the results will not be linked directly to you.

	Q9. Happen in the area	Q10. Personally involved in P12M
Fishing	1	1
Farming	2	2
Diving	3	3
Water/ river dredging	4	4
Aqua sports such as swimming, rafting, jet skiing,	5	5
Game Shooting (shooting of animals for sport)	6	6
Cutting down of trees for Coal	7	7
Tours (land or sea)	8	8
None -----> (SKIP TO Q11)	9	9

**Q11.** Which of these have you seen or heard of happening in The Negril Great Morass and wider Negril Environmental Protected Area the past 12 months?

**Q12.** Thinking about The Negril Great Morass and wider Negril Environmental Protection Area, which includes your community, how much of a problem are each of the following? Please tell me on a scale of 1-5 where the bigger the problem the higher the score you give it.

**Q13.** Which in your opinion is the biggest/most severe problem The Negril Great Morass and wider Negril Environmental Protection Area faces?

	Q11. Have occurred in P12M	Q12. How much of a problem					Q13. Most severe problem
		5	4	3	2	1	
Beach erosion/ loss of beach fronts	1	5	4	3	2	1	1
Less fish being caught	2	5	4	3	2	1	2
Fish no longer being found in that area areas	3	5	4	3	2	1	3
Reaping less produce /crops	4	5	4	3	2	1	4
Flooding	5	5	4	3	2	1	5
Landslides	6	5	4	3	2	1	6
Drought/ water shortage	7	5	4	3	2	1	7
Not enough water for farming	8	5	4	3	2	1	8
Reduced/ Less rainfall	9	5	4	3	2	1	9
Poor water quality	10	5	4	3	2	1	10
Water pollution	11	5	4	3	2	1	11
Removal / felling of trees	12	5	4	3	2	1	12
Loss of crops due to flooding	13	5	4	3	2	1	13
Loss of crops due to landslide	14	5	4	3	2	1	14
Fire	15	5	4	3	2	1	15
Sand/Riverbed Mining	16	5	4	3	2	1	16
Dumping of the wetlands	17	5	4	3	2	1	17
Spending a longer time to catch the same amount of fish	18	5	4	3	2	1	18

### SECTION 3-Attitude to Environment

**Q14.** To what extent are you concerned or worried about nature, or the natural surroundings of your community? When I say nature/ environment/ natural surrounding I mean everything that is around us, living or non-living things. It includes animals, plants, soil, water, and other living and non-living things.

Would you say you ...?

- Have **no concerns** about the natural surroundings of my community
- Have **few concerns** about the natural surroundings of my community
- Have **some concerns** about the natural surroundings of my community
- Are **quite concerned** about the natural surroundings of my community
- Are **extremely concerned** about the natural surroundings of my community

**Q15. Why do you say so? What do you mean by that? (Probe fully)**

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**Q16.** Please tell me the extent to which you agree with the following statements. **You can use any score in between 1 and 5 which best reflects your opinion.** “1” means “Strongly Disagree/ Definitely No” and “5” means “Strongly Agree/ Definitely Yes”

	Strongly Agree/ Definitely Yes	Agree/ Maybe Yes	Neither Agree nor Disagree	Disagree/ Maybe No	Strongly Disagree/ Definitely No	Don't know (Do not read)
The balance of nature is very delicate and easily upset	5	4	3	2	1	99
Humans are severely abusing the environment	5	4	3	2	1	99
I oppose any removal of natural areas no matter how economically beneficial their development may be.	5	4	3	2	1	99
In my daily life I try to find ways to conserve water or power.	5	4	3	2	1	99
I am not the kind of person who makes efforts to conserve natural resources.	5	4	3	2	1	99
Humans are no more important in nature than other living things.	5	4	3	2	1	99
Protecting peoples' jobs is more important than protecting the environment.	5	4	3	2	1	99
Humans do NOT have the right to damage the environment, just to get greater economic growth.	5	4	3	2	1	99
Protecting the environment is more important than protecting economic growth.	5	4	3	2	1	99
In order to protect the environment we need economic growth.	5	4	3	2	1	99



**SECTION 4-Awareness of Environmental and economic benefits of Wetlands such as Mangrove Forests**

**Q17.** Please tell me the extent to which you agree with the following statements. **You can use any score in between 1 and 5 which best reflects your opinion.** “1” means “Strongly Disagree/ Definitely No” and “5” means “Strongly Agree/ Definitely Yes”

Wetlands such as <i>The Negril Great Morass or other mangrove areas</i> ...	Strongly Agree/ Definitely Yes	Agree/ Maybe Yes	Neither Agree nor Disagree	Disagree/ Maybe No	Strongly Disagree/ Definitely No	Don't know (Do not read)
<b>Hydrological Functions</b>						
Helps protect areas in the Negril EPA from the full impact of storms.	5	4	3	2	1	99
Helps protect areas in the Negril EPA from flooding.	5	4	3	2	1	99
Causes flooding to areas in the Negril EPA.	5	4	3	2	1	99
Helps protect areas in the Negril EPA from beach erosion.	5	4	3	2	1	99
Prevents high tides from destroying the coastline and act as a buffer against strong winds.	5	4	3	2	1	99
Improves water quality by filtering water passing through it to the sea	5	4	3	2	1	99
The roots of mangroves hold soil firmly to prevent erosion by waves, rain and high tides.	5	4	3	2	1	99
<b>Provision of resources</b>						
Allow animals to feed, and reproduce in a protected and safe area so they can increase in numbers.	5	4	3	2	1	99
Is important for maintaining the fish stock of the area.	5	4	3	2	1	99
Is important for the variety of animal and plants in the area	5	4	3	2	1	99
Provides a beautiful natural appearance/ view in the area	5	4	3	2	1	99
Are ugly and unsightly and serve no useful purpose	5	4	3	2	1	99
Provides job opportunities e.g. Fishermen, Divers etc.	5	4	3	2	1	99
<b>Ecosystem functions:</b>						
Provide a home for and support the survival of the unique plants and animals of the area	5	4	3	2	1	99
Removes and stores carbon dioxide from the atmosphere and so is important to help prevent global warming	5	4	3	2	1	99
Only causes mosquito breeding and harbours dangerous animals	5	4	3	2	1	99
Provide activities for fun and pleasure	5	4	3	2	1	99
Provides recreational activities linked to tourism.	5	4	3	2	1	99

Provide sight for visitors who come to the country annually to view, which in turn generates income for the country.	5	4	3	2	1	99
Improve the overall beauty of the area	5	4	3	2	1	99

### **SECTION 5-Knowledge of threats to the Wetland**

**Q18.** Which of the following do you believe negatively affect the wetland or mangrove, in particular The Negril Great Morass?

- Drought (shortage of rain)
- Garbage getting into the water
- Cutting down of trees
- Unplanned settlements in and around the wetland
- Fires
- Burning of Land by fire
- Use of Fertilizers
- Grazing of animals
- Water pollution from homes (chemical, solid waste and garbage)
- Water pollution from farms (chemical, solid waste and garbage)
- Water pollution from businesses including hotels and villas (chemical, solid waste and garbage)
- Water pollution from garages (chemical, solid waste and garbage)
- Dumping up of wetlands
- Dumping up of mangroves
- Dredging of rivers

### **SECTION 6-Effects of Degraded Wetland on the Environment**

**Q19.** Please tell me the extent to which you agree with the following statements. **You can use any score in between 1 and 5 which best reflects your opinion.** “1” means “Strongly Disagree/ Definitely No” and “5” means “Strongly Agree/ Definitely Yes”

	<b>Strongly Agree/ Definitely Yes</b>	<b>Agree/ Maybe Yes</b>	<b>Neither Agree nor Disagree/ Not sure</b>	<b>Disagree/ Maybe No</b>	<b>Strongly Disagree/ Definitely No</b>
Degrading (damaging) wetlands reduce how much income people can make from farming/fishing and tourism.	5	4	3	2	1
Degrading (damaging) wetlands increases the chances of rivers/ reservoirs /ponds becoming dirty with fine sand and clay	5	4	3	2	1
Degrading (damaging) wetlands can lead to loss of important wild plants and wild animals.	5	4	3	2	1
Degrading (damaging) wetlands can lead to loss of life and property	5	4	3	2	1

### SECTION 7-Attitudes to Conservation

**Q20.** There are various reasons for protecting areas such as the Wetlands and The Negril Great Morass. Please tell me how important you think each of the following is as a reason for protecting the area. *Scale 1-5*

**You can use any score in between 1 and 5 which best reflects your opinion. "1" means "Not at all important" and "5" means "Extremely Important"**

Wetlands such as <i>The Negril Great Morass or other mangrove areas ...</i>	Not at all Important	Not Important	Neither Important nor not important	Important	Extremely Important	Don't know
Helps protect areas in Negril EPA from the full impact of storms.	1	2	3	4	5	99
Helps protect areas in Negril EPA from flooding.	1	2	3	4	5	99
Helps protect areas in Negril EPA from beach erosion.	1	2	3	4	5	99
Prevents high tides from destroying the coastline and act as a buffer against strong winds.	1	2	3	4	5	99
Improves water quality by filtering water passing through it to the sea	1	2	3	4	5	99
The roots of mangroves hold soil firmly to prevent erosion by waves, rain and high tides.	1	2	3	4	5	99
<b>Provision of resources</b>						
Allow wild animals to feed, and reproduce in a protected and safe area so they can increase in numbers.	1	2	3	4	5	99
Is important for maintaining the fish stock of the area.	1	2	3	4	5	99
Is important for the variety of wild animal and wild plants in the area	1	2	3	4	5	99
Provides a beautiful natural appearance/ view in the area.	1	2	3	4	5	99
Provides job opportunities e.g. Fishermen, Divers etc.	1	2	3	4	5	99
<b>Ecosystem functions:</b>						
Provide a home for and support the survival of the unique wild plants and wild animals of the area.	1	2	3	4	5	99
Removes and stores carbon dioxide from the atmosphere and so is important to help prevent global warming.	1	2	3	4	5	99
Provide activities for fun and pleasure	1	2	3	4	5	99
Provides recreational activities linked to tourism.	1	2	3	4	5	99
Provide sight for visitors who come to the country annually to view, which in turn generates income for the country.	1	2	3	4	5	99
Improve the overall beauty of the area	1	2	3	4	5	99

**Q21.** Would you say you have enough information on actions you could possibly take to help protect the wetland (*The Negril Great Morass*)?                    **1.**    Yes                    **2.**    No

**Q22.** Do you think it is necessary to have information on how you could possibly help to protect the wetland (*The Negril Great Morass*)?                    **1.**    Yes                    **2.**    No

**Q23.** Why do you say so? What do you mean by that? (**Probe fully**)

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**Q24.** How much of an effect do you think individuals such as yourself can have on protecting the wetland?

- Can have an **extremely large** effect
- Can have **quite** a large effect
- Can have **some** effect
- Can have **very little** effect
- Can have **no** effect

**Q25.** Please tell me the extent to which you agree with the following statements. **You can use any score in between 1 and 5 which best reflects your opinion.** “1” means “Strongly Disagree/ Definitely No” and “5” means “Strongly Agree/ Definitely Yes”

	<b>Strongly Agree/ Definitely Yes</b>	<b>Agree/ Maybe Yes</b>	<b>Neither Agree nor Disagree/ Not sure</b>	<b>Disagree/ Maybe No</b>	<b>Strongly Disagree/ Definitely No</b>
The state of the wetland is important to my life	5	4	3	2	1
It is my personal responsibility to protect water quality	5	4	3	2	1
It is my personal responsibility to protect the wetland	5	4	3	2	1
Good water quality is important for economic development	5	4	3	2	1
A healthy wetland is important for economic development	5	4	3	2	1
My actions have an impact on water quality	5	4	3	2	1
My actions have an impact on the wetland	5	4	3	2	1
The quality of life in my community depends on good environmental practice(s)	5	4	3	2	1
Protecting the environment influences the amount of money I earn (income generation)	5	4	3	2	1
Protecting the environment influences the amount of money the country earns (income generation)	5	4	3	2	1

**Q26.** Based on what you know or have heard, which of the following are ways of preserving and protecting The Negril Great Morass and the wider Negril Environmental Protection Area?

**Q27.** Which of the following have you ever engaged in?

**Q28.** Which do you currently practice (within the past 12 months)?

	<b>Q26.</b> Know/ Heard of	<b>Q27.</b> Engage in	<b>Q28.</b> Currently Practice
Public clean up days	1	1	1
Planting Trees whether fruit, timber, Palms and Mangroves	2	2	2
Proper disposal of animal waste/manure	3	3	3
Placing fish pots at the edge of the mangrove/ wetland	4	4	4
Reduce over fertilizing or use organic fertilizer (no chemical is used at all and takes a longer time to grow)	5	5	5
Proper waste disposal (chemical, solid waste and garbage)	6	6	6
No lighting /Controlled lighting of fires	7	7	7
No fishing in protected areas	9	9	9
Proper disposal of household waste	10	10	10
No overfishing of an area	11	11	11
Replanting trees whether fruit, timber, Palms and Mangroves	12	12	12
Unplanned development or unapproved building within the protected areas	13	13	13
No fishing in the mangrove	14	14	14
None of the above	15	15	15

**Q29.** How willing would you be to practice the following activities? **You can use any score in between 1 and 5 which best reflects your opinion.** “1” means “Very Unwilling” and “5” means “Very Willing”

	<b>Very Unwilling</b>	<b>Unwilling</b>	<b>Neutral</b>	<b>Willing</b>	<b>Very Willing</b>
Pay (additional) taxes to help improve the quality of the wetland (trees, water, coastline, seagrass beds, coral reefs)	1	2	3	4	5
Join or be a part of community organizations that work towards preserving the environment	1	2	3	4	5
Change the way you manage your property to improve the environment	1	2	3	4	5
Take part in tree (including mangroves) planting exercises	1	2	3	4	5
Take part in beach/ wetland/ mangrove clean-up days	1	2	3	4	5
Use less chemicals on farm (Insecticides and herbicides)	1	2	3	4	5
Take steps to prevent soil erosion such as not cutting down trees including mangroves	1	2	3	4	5
Proper waste disposal (chemical, solid waste and garbage)	1	2	3	4	5
Attend trainings or meetings to learn how to take care of the wetland	1	2	3	4	5
Promote wetlands/mangrove forest survival by not dumping up the wetlands/mangrove areas	1	2	3	4	5
Promote wetlands/mangrove forest survival by not starting fires in the wetlands/mangrove areas	1	2	3	4	5

**Q30.** What companies/ organizations are responsible for environmental management/ protecting nature or the environment in Negril? [Unprompted]

<b>RADA</b> (Rural Agricultural Development Authority)	<b>1</b>
<b>WRA</b> (Water Resource Authority)	<b>2</b>
<b>NEPA</b> (National Environment and Planning Agency)	<b>3</b>
<b>Forestry Department</b>	<b>4</b>

<b>SDC</b> (Social Development Commission)	<b>5</b>
<b>Negril Chamber of Commerce</b>	<b>6</b>
<b>NEPT</b> (Negril Area Environmental Protection Trust)	<b>7</b>
<b>Other (specify)</b>	<b>8</b>

**Q31.** Based on what you know or have heard, what is the function of the **National Environment and Planning Agency (NEPA)**?

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**Q32a.** Are you a part of any community based organizations? (*Not only environmental ones*)

1. Yes

2. No

**Q32b.** *If Yes. Which one?* \_\_\_\_\_

**Q33.** Have you participated in any environmental workshops in the past 12 months (P12M)?

1. Yes

2. No

#### **SECTION 8-Attitudes to Funerals**

*The following section is to gain public opinion on the topic of funeral arrangement for the deceased. Now I would like to ask you a number of questions on your views about funeral arrangement and the need to manage Jamaica's scarce land resource.*

**Q.34** How comfortable are you personally with discussing death?

	<b>Completely comfortable</b>	<b>Very comfortable</b>	<b>Relatively comfortable</b>	<b>Not very comfortable</b>	<b>Not at all comfortable</b>	<b>Don't know</b>
	1	2	3	4	5	6

**Q35 a.** Do you have a funeral plan (that is, a plan for what happens to your body when you die)?

1. Yes
2. No

**Q35 b.** Do you believe having a funeral plan is important?

	<b>Very Unimportant</b>	<b>Unimportant</b>	<b>Important</b>	<b>Very Important</b>	<b>Don't Know</b>
	1	2	3	4	5

**Q36 a.** What method of laying to rest would you most consider for yourself?

**Q36 b.** What method of laying to rest would you most consider for a close family member?

	<b>Q36a.</b> Yourself	<b>Q36b.</b> Your close Family member
Ground Burial	1	1
Cremation	2	2
Other: _____	3	3

**Q37. If ground burial is selected for themselves:** Where would you want to be buried?

Private/ Family cemetery	1
Public cemetery (Government Owned)	2
Religious/ Church cemetery	3
Commercial/ Non-denominational cemetery (e.g. Dovecot, Meadowrest)	4
Other: _____	5

**Q38 a. If ground burial is selected for themselves:** Which of the following burial memoriam/ accessories would you prefer?

**Q38 b.** Do you currently have a loved one laid to rest in any of the following memoriam/ accessories?

	<b>Q38a.</b> Yourself	<b>Q38b.</b> Your close Family member
Above ground vault (a tomb that rests <b>above</b> the <b>ground</b> )	1	1
Headstone (a slab of stone set up at the head of a grave, typically inscribed with the name of the dead person, can be upright, slanted or flat)	2	2
Monument (a statue or other structure placed over a grave to memorialize a person)	3	3
Mausoleum (a building housing a tomb or group of tombs)	4	4
Flush Grave Marker (a flat stone that lays flush with the ground, with simple engraving that is placed at the head of the grave)	5	5
Ledger Grave Marker (Thick slab of stone that covers the entire grave and is the length of the grave)	6	6

**39 a.** Do you visit your loved one's grave?

1. Yes

2. No



**39 b. If YES:** How often do you visit their grave?

	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>	<b>Yearly</b>	<b>Less Often</b>
	1	2	3	4	5

**Q40.** If these alternative method of laying to rest became available in Jamaica which would you consider? *You can answer Very likely, likely, not likely, not at all likely*

	<b>Very Likely</b>	<b>Likely</b>	<b>Not Likely</b>	<b>Not At All Likely</b>	<b>Don't Know</b>
<b>Sea burial</b> (body is placed in a casket and released into the open sea)	1	2	3	4	5
<b>Natural Burial</b> (body is buried underground without being embalmed or placed in casket)	1	2	3	4	5
<b>Biodegradable burial pods/ urns</b> (body is placed in a sac and is broken down over the years and a tree is planted above where the body is buried)	1	2	3	4	5
<b>Cryomation</b> (freezing the body in nitrogen, then vacuuming the body to remove moisture eventually leaving a sterile powder)	1	2	3	4	5

**Thank respondent for their time!**

## Appendix 2

### IWECO KAPB Depth Interview Guide (1hr)

#### Introduction (5 minutes)

##### Explain:

- Purpose of group, the length of time it will take
- Respondents must speak clearly and one at a time
- There are no right or wrong answers, any thoughts they have pertaining to the discussion is desirable
- Reasons for taping and refreshments are provided.
- Ask respondents to introduce themselves by telling their first name, how long they have been living in the community and what do they do for a living?

##### Introduction

- So I am not from here, I know nothing about Negril. If you were to explain in your own words, tell me about life in Negril.
- An average day in your life, what is it like? Explain to me what your day would look like if I was to hang out with you for a day.
- Are you happy with life in your community/ parish? Why?

##### **THEME: WHAT IS THE PROBLEM?**

- What environmental problem exists in your community?
- How big of a problem is it? Why?
- **If not mentioned:** Is there an issue of poor water quality/drought/ shortage of water in your area?
- **If not mentioned:** Is there an issue of beach erosion in your area?
- **If not mentioned:** Is there an issue of waste/garbage disposal in your area?
- **If not mentioned:** Is there an issue of unemployment in your area?
- **If not mentioned:** Is there an issue of lack of land and housing in your area?
- **If not mentioned:** Is there an issue poverty in your area?
- **If not mentioned:** Is there an issue of crime in your area?

##### **THEME: DEFINITION/CONTEXT**

- **For each issue identified:** When you say ( ) is an issue, tell me what does that mean?
- Tell me a story about this.

##### **THEME: EFFECTS OF THE PROBLEM**

- How has this affected you? Explain
- How has this affected others? Explain
- How has this affected the community? Explain
- Do you think there are people who are more affected than others because of these problems? Who? Why do you say so? How?

**THEME: WHO IS CAUSING THE PROBLEM?**

- What/Who do you think has caused this issue? Tell me a story about this.
- Do people who live, work and own businesses in the community contribute to these problems in the environment? Who? How so? Why do you say so?
- Do people who do not live, work and own businesses in the community i.e. may be tourists or visitors contribute to these problems in the environment? Who? How so? Why do you say so?
- Do you think there is anything that you have done to contribute to the problem? How so?

**THEME: HOW DO WE SOLVE THE ISSUES?**

- What can be done to improve life in your community? Explain
- Thinking about all the problems you mentioned, do you think they can be stopped? Why? How so? Explain
- Who has a responsibility to protect the environment? Why do you say so?
- Do you think there are some people who have a greater/more responsibility to protect the environment? Why do you say so?
- Would you attend a class that teaches you how to protect your environment? Why/Why not?
- Would you participate in a beach clean-up day? Why or why not?

## Appendix 3

*Map of Jamaica Showing Negril Great Morass*





Map of Jamaica Showing Negril Environmental Protection Area  
and Negril Watershed Boundary



## Appendix 4

### List of EDs from which sample was randomly selected

#### Westmoreland

<u>Community</u>	<u>ED#</u>	<u>Population</u>
The Great Morass	W1	513
The Great Morass	W2	365
The Great Morass	W3	180
The Great Morass	W4	391
Silver Spring/ Springfield	W5	270
Spring Garden/ Moreland	W6	391
Delve Bridge/ Spring Garden	W56	394
Spring Garden	W57	385
Retreat	W58	334
Sheffield	W59	644
Negril Spots	W60	387
Negril Spots	W61	435
Hopewell	W62	459
	W63	235
Nonpariel (Mt. Airy)	W64	620
Whitehall/ Good Hope	W65	729
Whitehall	W66	391
Whitehall	W67	244
Whitehall	W68	486
Whitehall	W69	327
Whitehall	W70	527
Whitehall	W71	569
Whitehall	W72	340
Whitehall	W73	215
Whitehall	W74	302
Whitehall	W75	312
Red Ground	W76	528
Negril	W77	685
Westlands	W78	387
West End	W79	287
West End	W80	473
West End	W81	504
West End	W82	593
Retirement	W83	949
Revival	W84	792
Retreat	W85	796

	W86	495
Little Bay	W106	355
Old Hope Pen	W107	266
	<b>Total</b>	<b>17555</b>

**Hanover**

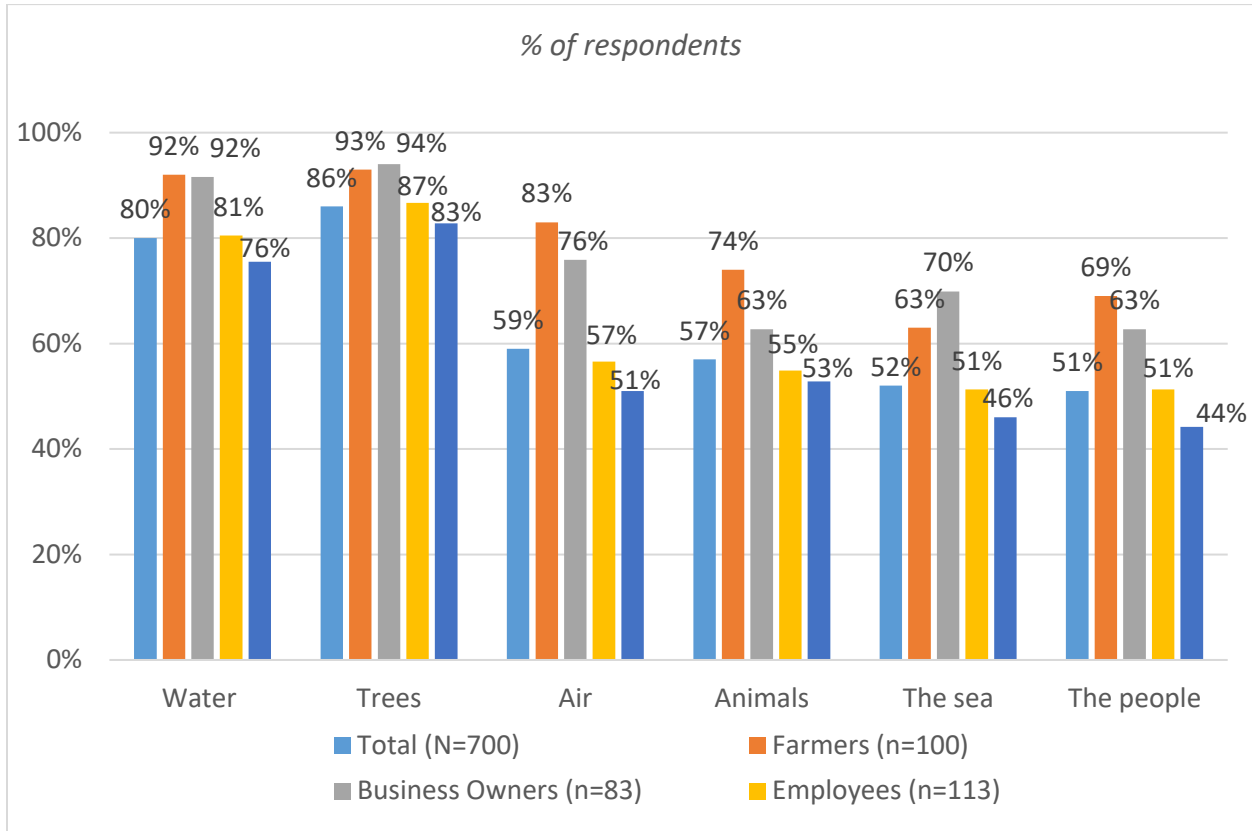
<u>Community</u>	<u>ED#</u>	<u>Population</u>
Spring Valley/ Industry/ Cove	W40	468
Cove	W41	332
Harding Hall	W42	376
Cauldwell	W43	491
Cauldwell	W44	231
	W65	436
Caidwall	W66	358
Prospect	W67	528
Green Island	W68	774
Green Island	W69	451
Haughton Hall	W70	323
Haughton Hall	W71	391
Rhodes Hall/ Mount. Pleasant	W72	625
Mount. Pleasant	W73	283
Mount. Pleasant	W74	489
Mount. Pleasant	W75	286
Ireland Pen/ Rutland Pen	W76	274
Mount Pleasant	W77	573
Santoy	W78	665
Phoenix Town	W79	423
Winchester	W80	287
Hatchwell	W81	321
Grange	W82	331
Grange	W83	343
	W84	253
Kendal	W85	378
Rock Spring	W87	408
Jerusalem/ Newfound River	W88	407
March Town	W89	584
Cave Valley	W90	457
	W91	357
Fish River	W92	311
Campbelton	W93	626

Campbelton	W94	190
	W95	413
Campbelton	W96	486
Orange Bay/ Logwood	W97	461
The Great Morass	W98	152
	<b>Total</b>	<b>15542</b>

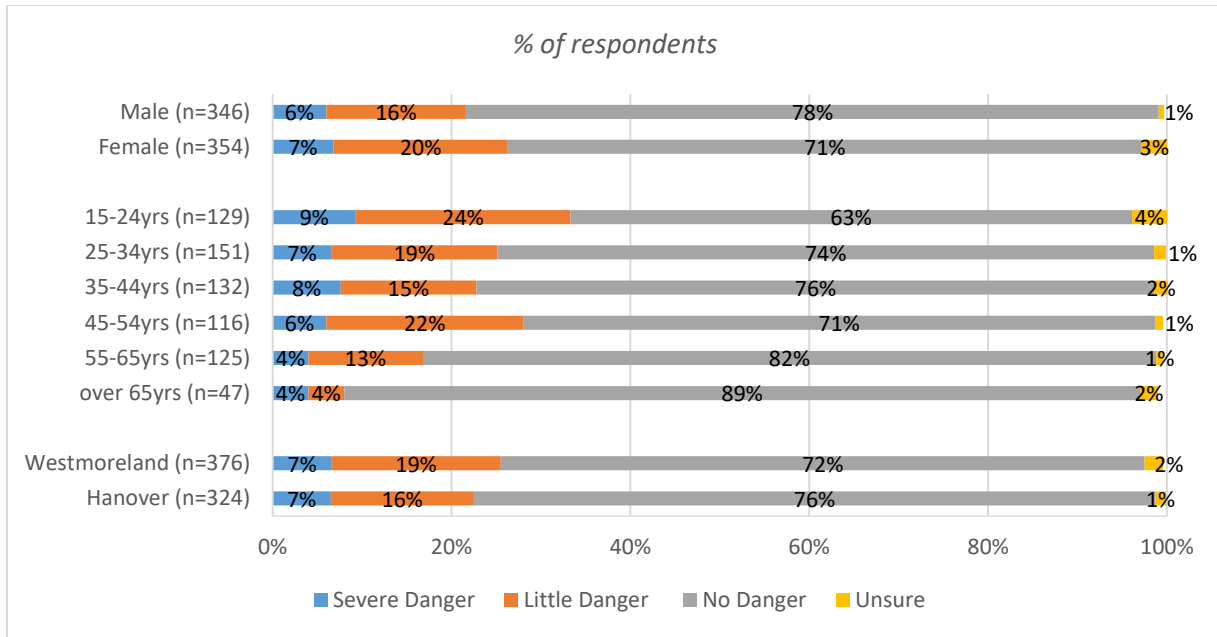


## Appendix 5

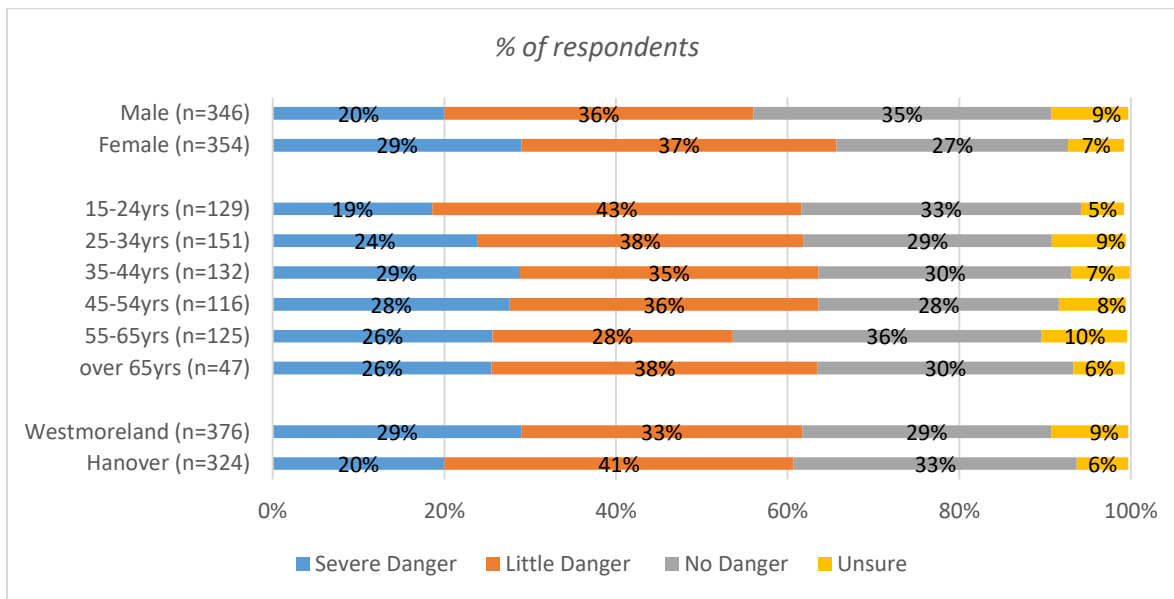
### Additional Figures



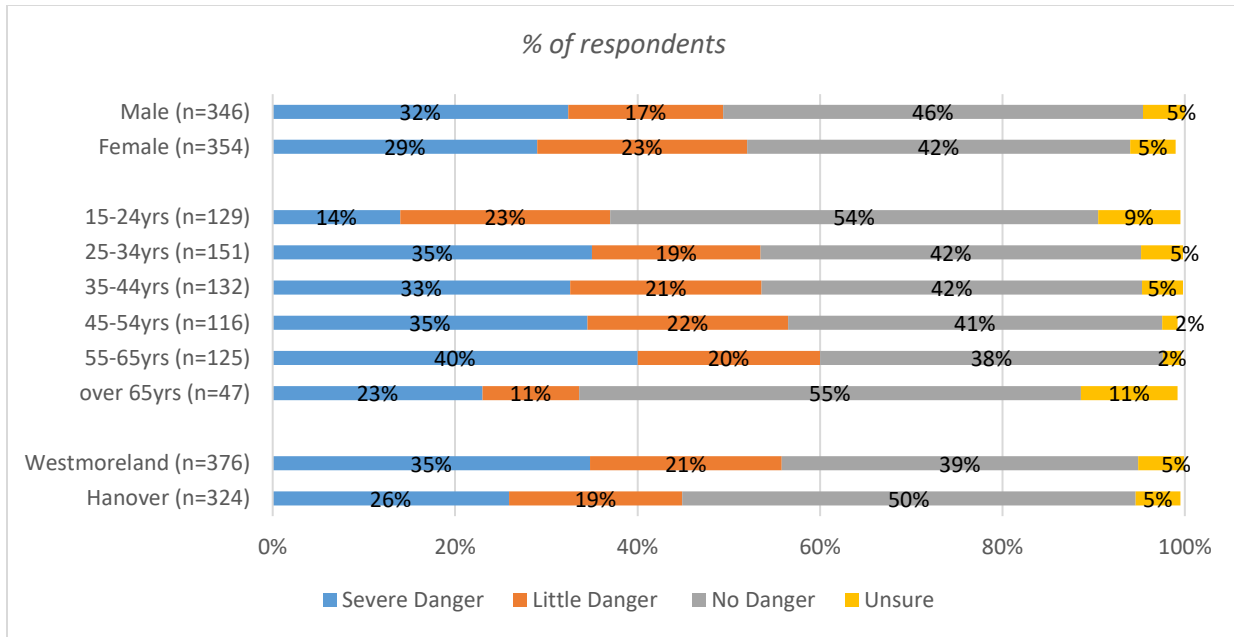
Ai: Top 6 Words Associated with Environment By Respondent Type



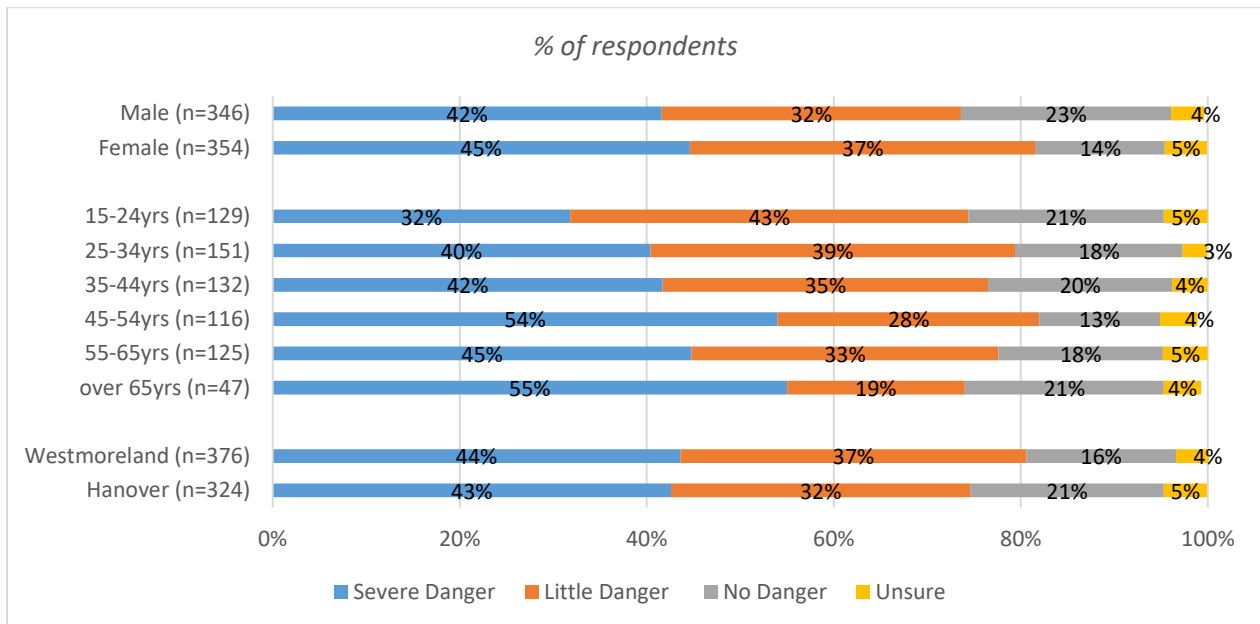
*Extent to which You Think Your Community Is in Danger of Landslides/landslips by Demographics*



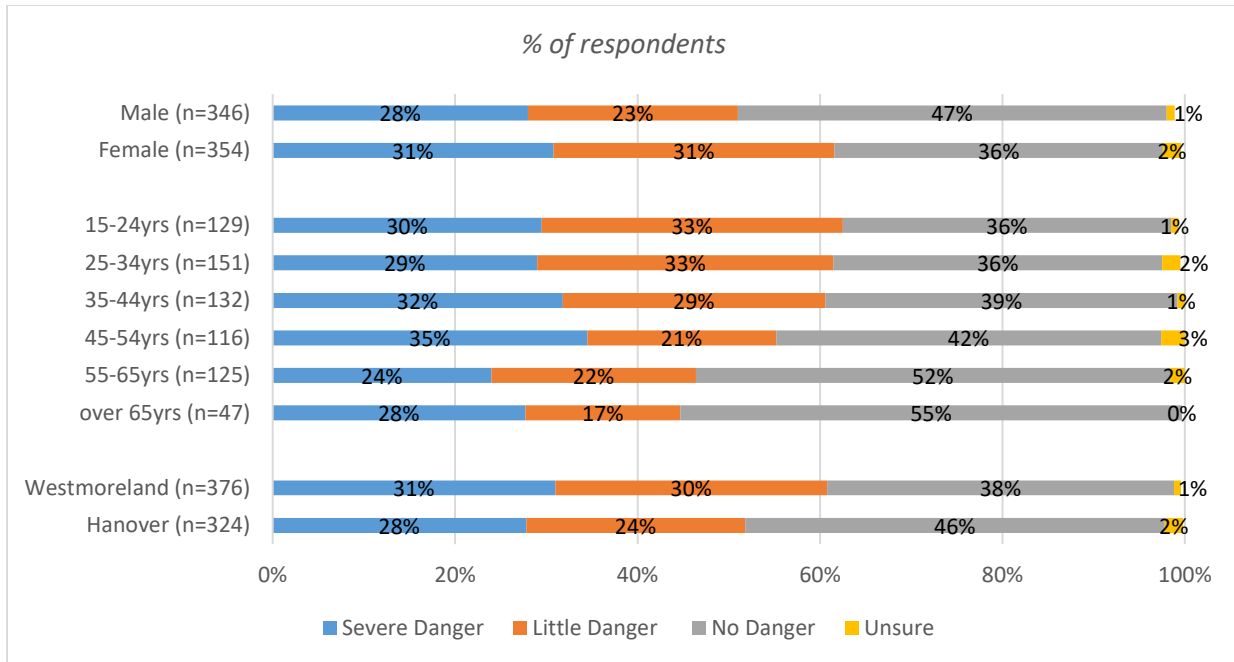
*Aii: Extent to which You Think Your Community Is in Danger of Earthquakes by Demographics*



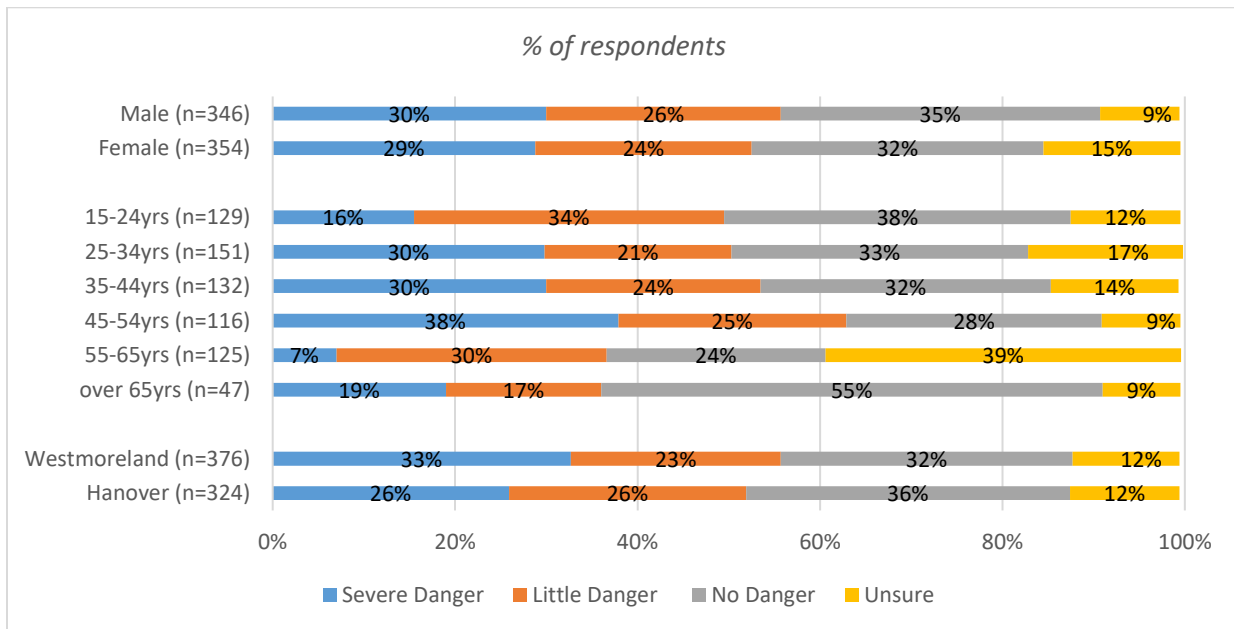
Aiii: Extent to which You Think Your Community Is in Danger of Coastal Erosion by Demographics



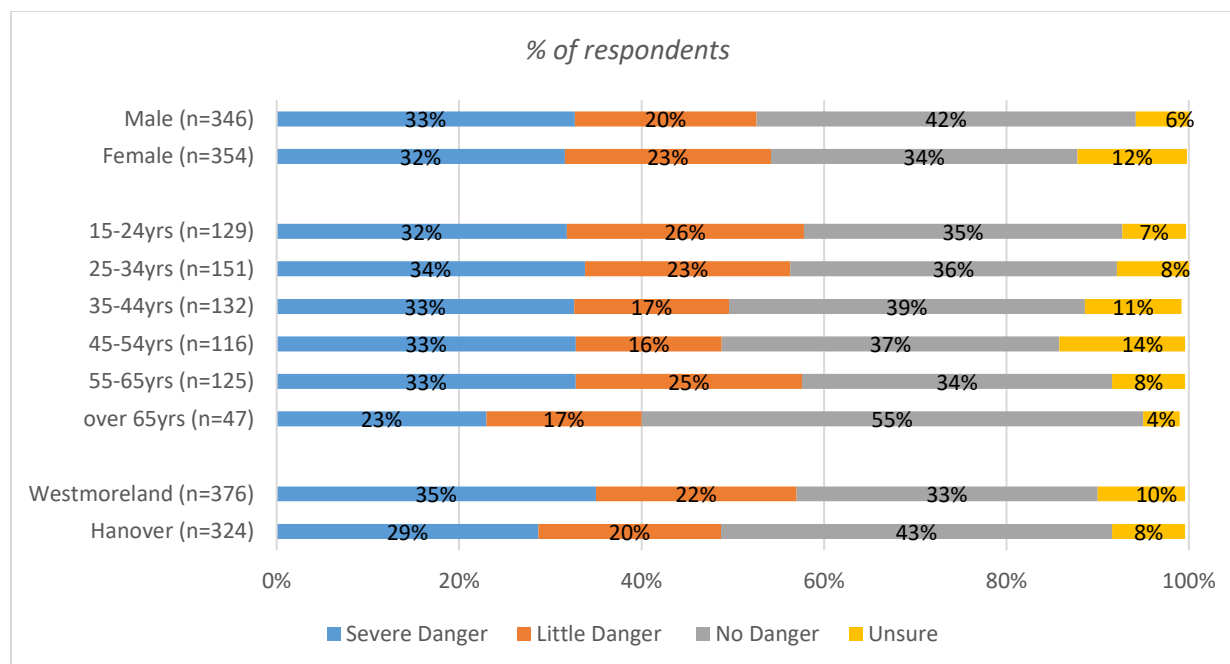
Aiv: Extent to which You Think Your Community Is in Danger of Drought/Water Shortage by Demographics



Av: Extent to which You Think Your Community Is in Danger of Fires by Demographics



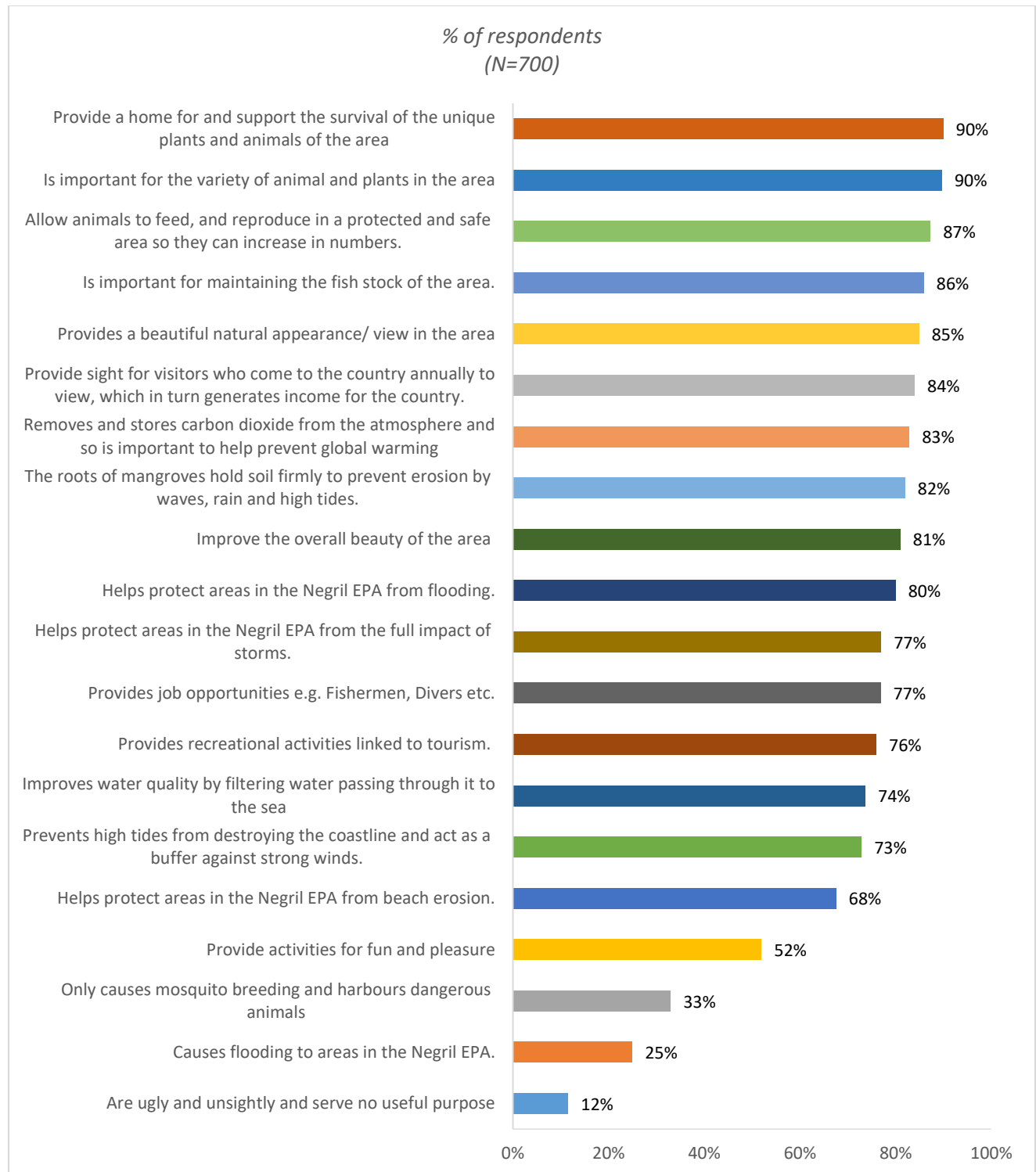
Avi: Extent to which You Think Your Community Is in Danger of Declining fish stocks by Demographics



*Avii: Extent to which You Think Your Community Is in Danger of Rising Sea Levels by Demographics*

*Aviii: Extent to which You Think Your Community Is in Danger of the following threats*

	% of respondents (N=700)			
	Severe Danger	Little Danger	No Danger	Unsure
<b>Storms/Hurricanes</b>	43.1	34.7	18.1	4.0
<b>Drought/Water Shortage</b>	33.4	31.1	34.7	0.7
<b>Rising Sea levels because of global climate change</b>	32.1	21.3	37.6	9.0
<b>Coastal Erosion/ Loss of beaches</b>	30.7	20.3	44.0	5.0
<b>Fires</b>	29.6	27.1	41.9	1.4
<b>Declining Fish Stock</b>	29.6	24.7	33.7	12.0
<b>Earthquake</b>	24.9	36.4	31	7.7
<b>Flooding</b>	21.1	36.9	40.9	1.1
<b>Landslides/Landslips</b>	6.6	17.6	74.1	1.7



Aix: Knowledge of Ecosystem Services Provided by the Wetland: Top 2 Box (Strongly Agree/Agree)

**Ax: Extent to which respondents agreed with the following statements**

	% of respondents (N=700)					
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Don't know
In my daily life I try to find ways to conserve water or power.	48.3	41.6	3.9	5.0	1.3	0.0
Humans are severely abusing the environment.	43.1	37.1	4.1	11.7	3.0	0.9
The balance of nature is very delicate and easily upset.	41.0	42.0	5.1	7.0	1.7	3.1
Humans do NOT have the right to damage the environment, just to get greater economic growth.	36.9	42.6	7.0	8.4	4.1	1.0
I oppose any removal of natural areas no matter how economically beneficial their development may be.	30.9	35.3	10.1	16.9	4.9	2.0
In order to protect the environment we need economic growth.	29.3	50.6	7.6	9.0	2.1	1.4
Protecting the environment is more important than protecting economic growth.	23.9	33.7	25.7	11.4	3.0	2.3
Humans are no more important in nature than other living things.	22.1	25.1	6.9	32.3	12.1	1.4
Protecting peoples' jobs is more important than protecting the environment.	7.9	10.7	24.4	39.0	16.0	2.0
I am not the kind of person who makes efforts to conserve natural resources.	7.0	15.4	4.1	48.4	24.1	0.9