

## **EXPLORING A COMMUNITY'S KNOWLEDGE AND USE OF A COASTAL MANGROVE RESOURCE: THE CASE OF WELLINGTON PARK, GUYANA**

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**Abstract:** One of the greatest challenges that Guyanese are expected to face in the future is protection of the coast especially in this time of global climate change. In this regard conservation of coastal mangroves is critical if success is to be achieved. Recent emphasis on mangrove restoration through the Guyana Mangrove Restoration Project (GMRP) has seen renewed interest at the Government policy level. A rapid assessment study was conducted which sought to determine a coastal community's knowledge about the role of mangroves, utilization of the resource and their readiness to participate in mangrove restoration activities. The population sample was drawn from among the coastal community at Wellington Park, on the Corentyne Coast, Administrative Region Six. Mangrove restoration was perceived as a worthwhile venture with tremendous benefits for the community. Traditional and cultural uses of mangroves were identified along with new emerging uses. Respondents felt that community members should be involved in promoting and sustaining mangrove conservation efforts. Some key recommendations that were made included a more vigorous and sustainable community education awareness programme to inform persons about the roles, potential and accrued benefits of mangroves and the roles community members can play in the mangrove conservation programme.

**Keywords:** Mangroves, Wellington Park, communities, Guyana, conservation and restoration

### **BACKGROUND**

Guyana, an English speaking country in the northeastern corner of South America, along the Atlantic Ocean, also shares borders with Suriname, Venezuela and Brazil. Five major biophysical regions define this country: the Low Coastal Plain, the Pre-cambrian Lowland Region, the Pakaraima Highlands, the Southern Upland Region and the Interior Savannas. The Low Coastal Plain, which is of varying width, between 26km-77km, is approximately 1.4m below mean high tide levels and stretches approximately 425km is flat and is protected by natural and man-made sea-defences, mud banks, mangroves and sand flats (Daniel, 1990). In spite of these protective features, coastal areas in Guyana are still prone to flooding and are likely to be affected by sea level rise. The coast is a major population centre with more than ninety percent (90%) of the Country's population and is therefore an economically and

socially important region of the country. Although there are accretion and erosion cycles the coast is still colonized by mainly black mangroves, *Avicennia germinans* (Daniel, 1990; Da Silva, 2014). Coastal mangroves provide services and resources to many communities but they also suffer from anthropogenic activities and natural processes (Pastakia, 1991; Alongi, 2002; Bayney & Da Silva, 2005; Blasco and Aizpuru, 2002; Da Silva, 2004; Mann, 1982).

Mangroves were once found along much of Guyana's coast but in recent times, the coastal mangrove belt has been severely depleted. While it is often assumed that anthropogenic impacts are mainly responsible for this loss, the deterioration and loss of groynes, increases in sea level and wave energy are also noted as the principal factors contributing to this depletion. Over the years, increasing pressure on the stability of the coastal zone, loss of natural protective mangrove vegetation, collapse and overtopping of existing sea defences has increased, leading to renewed efforts for construction and rehabilitation of man-made sea defences.

The essential role that mangroves play in coastal defence, their role in carbon sequestration, the increased risks posed by predicted rise in sea level and the rising cost of maintenance of the current man-made sea defense structures, have prompted a commitment on the part of the Government of Guyana to actively promote the conservation, restoration and protection of mangrove ecosystems (NMMAP, 2010). In spite of their importance there is very little written information about the level of community knowledge and use of these ecosystems. This study seeks to investigate the knowledge and use of one coastal community, Wellington Park, which is adjacent to an identified mangrove conservation reserve.

#### **MANGROVES SPECIES IN THE WELLINGTON PARK MANGROVE RESERVE**

There are three known species of mangroves in Guyana; *Avicennia germinans* (black mangrove), *Rhizophora mangle* (red mangrove) and *Laguncularia racemosa* (white mangrove). Research by Tom Holowell in 2009 has reported *Rhizophora racemosa* as occurring in the Barima-Waini region and herbarium records show a possible fourth species, *Rhizophora harisonii*. While it is also reported in 'The World's Mangroves 1980-2005' that *Avicennia schaueriana* is present in Guyana (FAO, 2007), there is no herbarium evidence in Guyana of the presence of this species. At the Wellington Park Mangrove Reserve (WPMR) *Avicennia germinans* predominates along the seaward coastal areas with a very small amount of white mangroves, *Laguncularia racemosa* and an almost total absence of the red mangrove, *Rhizophora mangle*. The other vegetation in the area is representative of typical mangrove associates found in Guyana. Recently there have been efforts to replant areas of

the WPMR with the black mangrove as part of a restoration project implemented by the Guyana Mangrove Restoration Project (GMRP).

### **THE GUYANA MANGROVE RESTORATION PROJECT**

The GMRP which was launched in February 2010 represents one of Guyana's efforts to address the impact of climate change. This project was funded by the European Union and the Government of Guyana for the period 2010-2013 and sought to undertake mangrove restoration, promote research on carbon sequestration, reforestation and forest preservation while actively mitigating the effect of climate change on sea defence structures, coastal biodiversity and human life and livelihoods. The GMRP was managed in its initial stages by the Mangrove Action Committee (MAC) within the Climate Change and Agricultural Adaptation Unit of the Ministry of Agriculture. It is now being managed as a Government of Guyana undertaking through the National Agricultural Research and Extension Institute (NAREI). This project has the potential to promote and reinforce the spirit of community wellbeing while sensitizing residents of the benefits to be derived from the conservation of mangrove ecosystems. The objectives of the GMRP are to:

- establish the administrative capacity for the management of mangroves in Guyana.
- promote sustainable management of mangrove forests.
- establish and complete a legal framework for mangrove ecosystem management which encourages community based participation.
- support research and development of Guyana's mangrove forest.
- develop effective protection and / or rehabilitation of mangrove ecosystems.
- increase public awareness and education on the benefits of mangrove forests.

This current community awareness survey was conducted out of concern that community members' may not have had a high level of knowledge about and appreciation for the value of mangroves. It was the general feeling that if persons were to be meaningful participants in the conservation and rehabilitation processes then they will require relevant knowledge about mangroves and their value and an understanding of how as individuals and as a community they can promote and sustain this conservation and restoration activity.

### **METHODOLOGY**

The survey method and a convenient sample was used to gather information from participants who responded to a questionnaire with forty-eight (48) items on demographic data, knowledge about mangroves and knowledge about the mangrove restoration project, skills to advance mangrove restoration, attitudes that could affect mangrove rehabilitation, cultural

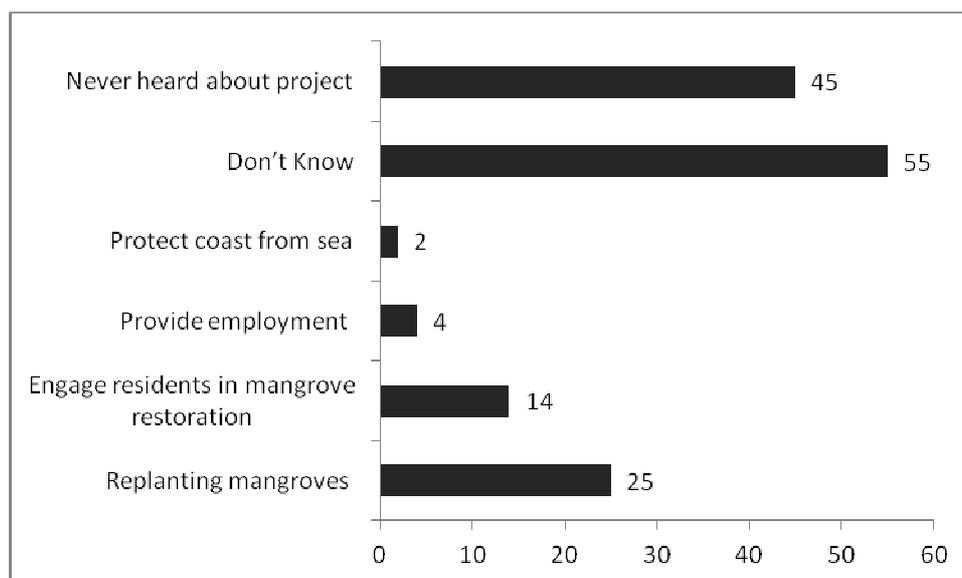
practices and recommendations for prevention of destruction to mangroves. A descriptive approach was employed to present the findings of this study. The study sample comprised one hundred and twenty (120) community members from the coastal community of Wellington Park in Administrative Region Six of the country..

### **KNOWLEDGE ABOUT MANGROVES AND THE GMRP**

While more than three quarters (76.8%) of all respondents knew the term ‘mangrove’ and what mangroves were, only 64.6% were familiar with the local common name ‘courida’. When this was correlated with the age of respondents it was observed that the respondents who knew the term ‘courida’ were from the 36-55 years age group. This suggested that the younger generation may not have been very familiar with the traditional local common name for mangroves. This could be useful in making a case for some efforts to promote greater exposure to oral traditions in community knowledge to be organized. Such sessions can help preserve these oral traditions while assisting with cultural preservation and sensitization.

The results showed that 68% of the respondents interviewed were aware of the project. Seventy-nine percent (79%) of the respondents from Wellington Park who were aware of the project indicated that they first became aware of the project when they saw the advertising billboard in the village. This is noteworthy for future awareness programmes since it indicates that consideration ought to be given to additional forms and modes of promotion of such projects. Further it should be noted that some persons may be more observant earlier to one form of media or than another as well as to different modes and stimulus materials.

What was evident was the distinction that needed to be made between knowing that there was a project on mangroves and actually knowing what the project was about. In the Wellington Park community only 35% of the 68% who knew about the project actually knew what the project was about. The responses regarding the purpose of the project were varied and included those who did not know, replanting mangrove at the sea shore, providing employment for community members and formation of mangrove management conservation committees (Figure 1). This suggests that either the awareness aspect of the project was not very robust, far reaching and effective or that persons were just not too interested in mangroves or the conservation of mangroves.



**Figure 1:** Respondents' Knowledge of the Project Purpose (reported in percentages)

Regarding community members knowledge of the species of mangroves in Guyana, 56% of the respondents were aware that there are several species of mangrove in Guyana. However, what was interesting was the fact that only 9% of the respondents in the Wellington Park community knew that there were three main species of mangroves in Guyana. In addition 10% of the respondents stated that animals would die if they were allowed to graze on mangroves. This was an interesting finding because further analysis revealed that the respondents from Wellington Park were actively engaged in animal rearing and knew that animals grazed on mangroves and in mangrove ecosystems.

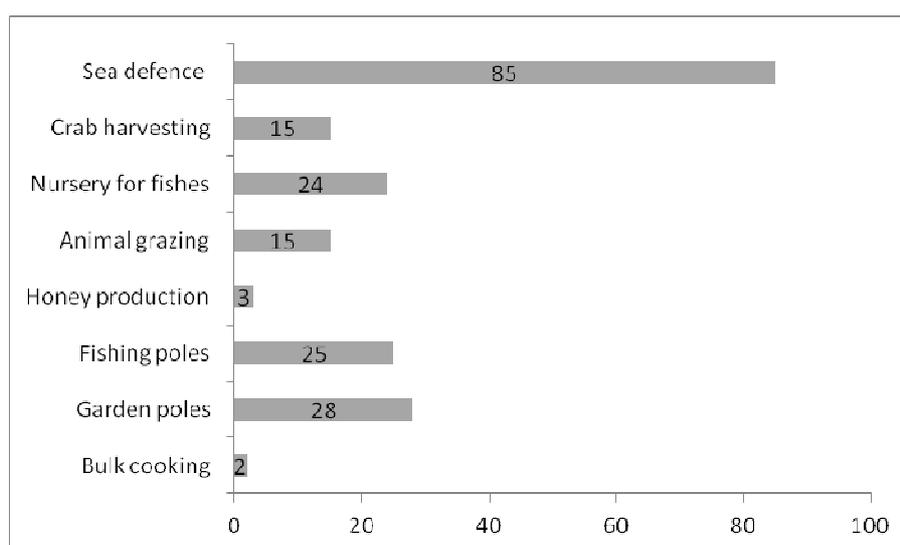
### **CULTURAL PRACTICES AND USES OF MANGROVES**

A significant percentage of respondents (85%) were able to identify several general uses of mangrove in Guyana (Table 1). However, 15% of the respondents did not know of uses to which mangroves were put in the community. This would seem to suggest that 85% had some knowledge of the role and value of mangroves. This is important because if community members do not have a very good knowledge of the roles of mangroves it could severely impact the way that the community values the mangrove resource and hence eventually affect their willingness to be involved in conservation efforts.

**Table 1:** General uses of mangroves identified by community members of Wellington Park

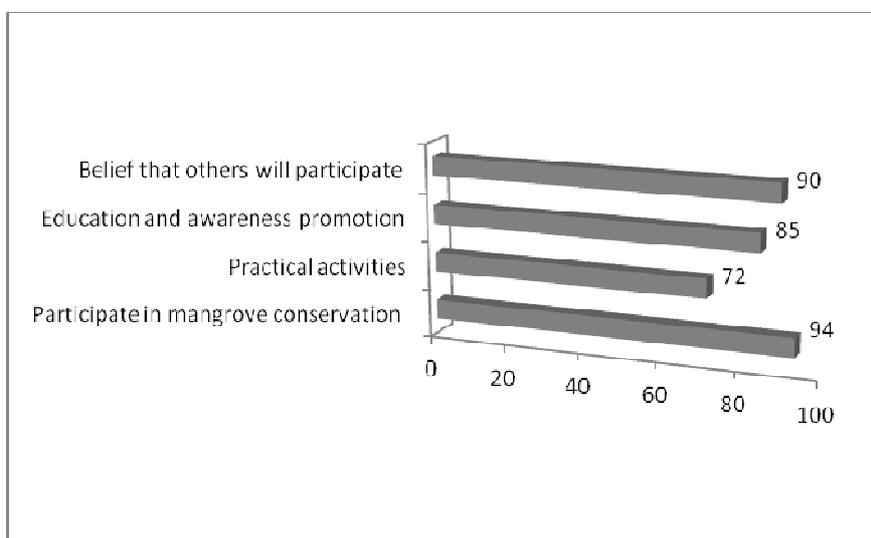
Use	Consumptive use or Non-consumptive use	What is Used	Mangrove species used
Sea defence	Non-consumptive	Mangrove Habitat	Black
Nursery for fishes	Non-consumptive	Mangrove Habitat	Black , Red
Crab harvesting	Non-consumptive	Mangrove Habitat	Black , Red
Honey production	Non-consumptive	Mangrove Habitat	Black
Poles for fish seines and garden fences	Consumptive	Stems	Black, White
Fuel wood	Consumptive	Stems	Black, White, Red
Animal grazing	Consumptive	Leaves and Fruits	Black

The most popular response (79%) in terms of use of mangroves was the role mangroves play in sea and coastal defence and protection from erosion. In Wellington Park while 86% of the respondents were aware of the fact that wood from mangroves was useful as fuel wood, however only 2% reported that they actually used wood for bulk cooking from the mangrove area (Figure 2). This may be due to the fact that respondents reported that they obtained wood for fuel wood quite easily and at affordable prices from sawmills in close proximity to their community. This greatly reduced the dependence on wood from the mangrove forest for use as fuel wood.

**Figure 2:** Major uses of mangroves in Wellington Park (Numbers are reported percentages).

## WILLINGNESS TO BE INVOLVED IN MANGROVE CONSERVATION ACTIVITIES

The majority of respondents gave positive responses to the question regarding their willingness to participate in mangrove restoration activities. Ninety-four percent (94%) of respondents from the Wellington Park community responded in a positive manner when asked about their support for current mangrove restoration efforts; 85% of the respondents were willing to participate in activities to learn more about mangrove restoration and 72% were willing to participate in practical activities relating to mangrove restoration. A significant proportion, 90%, of respondents believed that other community members would be willing to promote the restoration of mangrove (Figure 3).



**Figure 3:** Willingness of community members to participate in mangrove conservation activities (Numbers are reported percentages).

The data seems to suggest that this could be an opportune time for the GMRP to mobilize community support for the project in terms of education, paid and unpaid work since more than eighty percent (80%) of respondents reported a general willingness on their own behalf and on the community's behalf to promote the restoration activities.

Respondents also offered a number of suggestions to protect mangroves. Some suggested efforts to reduce grazing of animals in mangrove areas, encouraging people not to cut the trees, a total halt to the use of mangrove areas for waste disposal and outlawing improper fishing practices in the mangrove areas. Other responses included increased education and awareness efforts and greater promotion of the work being done by the GMRP. Respondents also recognized the efforts of the newly appointed mangrove rangers but felt that more

rangers were needed if a greater impact in terms of enforcing the regulations for greater compliance was to be realized.

The biographic data strongly suggested that both sexes of varying ages and with at least a secondary educational foundation could form the pool of human resource that could be available to promote mangrove restoration. Further respondents felt that increased education and public awareness would be the key to success in addition to identifying and enlisting the support of willing individuals to promote conservation activities.

Some respondents reported that while they received information via flyers and brochures through the VMAC the information was too general and did not specifically address the village project on mangroves. Community members wished to have more community specific information. Such information would go a long way towards helping them to understand the benefits that could accrue to their community.

It is important to understand community culture when working within communities. Community awareness and involvement is a determinant of project success in rural areas since there is a bond or closeness in communities that could be used to promote or hinder any community project. Communication behavior change strategies must always entail robust education and public awareness programmes that are tailored to the needs of the respective target group.

Cultural activities and anthropogenic factors that could become a threat to mangrove restoration were mainly reported as animal grazing (35%). Given that this use is critical to the livelihood of this community there is the potential for much resistance to any project that will appear to impact this current way of life. This activity will have to be addressed in the context of livelihoods and appropriate alternatives. The GMRP must therefore be concerned about cultural practices and devise strategies that respect traditions but prevent the destruction of mangroves. Alternative income generating activities such as additional employment as rangers, tour guides and others must also be seriously considered.

## **LESSONS LEARNT AND CONCLUSIONS**

This study identified current uses of mangroves in one coastal community in Guyana and determined that members of this community are willing to participate in activities to promote mangrove conservation.

The results also served to indicate that there is a need for increased awareness efforts to promote the GMRP in Wellington Park. Further it is important for the GMRP to ensure that there is a sustainable education and awareness programme for residents if they are going to

be involved as effective stakeholders and if they are to understand that the project can have cumulative benefits for them. In this regard it is important to note that the education component of the project may have been concentrating its efforts in schools to the slight neglect of the open community. Future education and awareness programmes should therefore target the open community while continuing the process in schools.

Although most residents have demonstrated their willingness to support the project, the Village Mangrove Action Committees (VMACs) need to increase their vibrancy and to assist the NDC and the GMRP to disseminate information and assist in promoting attitudinal and behavioral changes within the community.

The role of the residents in supporting this project, by protecting the mangroves could be strengthened if alternative forms of livelihood options are identified and promoted. In the Wellington Park study area there is evidence of a need for greater organization and a determination of livelihood options that may be exploited. The results of the survey suggest that the community at Wellington Park still perceives the project as a Government project with little roles for community leadership and initiative. This therefore illustrates that there is a need for more community development and promotion work to be done. Thomas-Holder (2012) in a study of Buxton-Friendship noted that “preparation of residents for ownership requires education but more importantly their significant participation in paid and unpaid project related activities using the very skills that they identified as available within their communities”. Involvement of community members at every stage of project planning to implementation is imperative in creating a sense of ownership which is absolutely necessary for sustainability. Perhaps this is a good time for project personnel to revisit the VMAC and the project planning execution strategies in an effort to make appropriate changes to reflect a more inclusive approach.

Although members of the community did not experience or foresee a problem regarding waste disposal in mangrove areas there is still need for continued education and awareness of the potential negative impacts of such inappropriate actions. Proper garbage disposal practices must be reinforced to discourage persons from using mangrove ecosystems as garbage dumps

In the final analysis, any attempt to promote mangrove conservation in this rural community must enlist the participation of community members using an aggressive awareness campaign to communicate the message that mangrove will protect all those who protect them. Their full understanding of the benefits to be accrued to the community and its members would be the

key to a successful restoration project. In this regard, consultation and education would be absolutely necessary to gain community trust and blessing for the project and support for its success. An understanding of the cultural practices and member's readiness to support a project which requires change to the way people live their lives is essential (Thomas-Holder (2012)).

The premise for this study was that in the absence of limited knowledge, willingness and readiness of members of this community to participate in the mangrove conservation project could be compromised and the success of the project could be jeopardized. The results indicate that the success and sustainability of this project will require continued efforts to encourage attitudinal changes and changes in some cultural and environmental practices as well as the way mangroves are valued. An opportunity is presented to inform further actions that need to be undertaken by the GMRP to ensure that the requisite willingness, knowledge, skill, attitudes and behaviors exist within the community to advance work that has already begun. More so, it is important to note that people tend to resist change when they do not understand or are not convinced about the reasons for the change or direct benefit to them. Village Mangrove Action Committees need to be more aggressive in maintaining the link between the GMRP and all the key community stakeholders who have demonstrated a willingness to embrace the project.

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