



CARIBBEAN NATURAL RESOURCES INSTITUTE
(CANARI)

CHARACTERIZATION OF THE AT-RISK POPULATION
IN THE BUFF BAY SUB-WATERSHED AND
EXISTING AND POTENTIAL BENEFITS FROM FOREST
RESOURCE USE

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EXECUTIVE SUMMARY

This study was commissioned by the Caribbean Natural Resources Institute in collaboration with the Jamaica Forestry Department and was implemented in the Buff Bay watershed in Portland. Its purpose was to characterize the population in the watershed living in or at risk of falling into poverty, to examine existing and potential benefits from forest use and to provide an overview of organizations operating in the valley and the involvement of local people in their activities.

Questionnaires were administered to a random sample of 30 persons. Interviews were conducted with some key persons in the area as well as personnel from organizations operating in the valley. Previous work on the watershed was reviewed and used to further inform the study.

After detailed analysis, the overall findings of the survey are that:

1. Most persons living in the Buff Bay valley fall below the poverty line as computed for Jamaica.
2. The poverty levels become more severe as one moves further up the valley and away from the main town of Buff Bay.
3. Farming is the mainstay of residents in the valley. Coffee, which is seasonal, is the main crop.
4. Farming practices are in the main responsible for the low levels of income of farmers as a result of (i) low yields per acre due to inadequate soil conservation techniques; (ii) inadequate utilisation of existing lands; and (iii) the inability to pay help to expand the area under cultivation.
5. The illiteracy rate is high and falls well below the national average.
6. The area suffers from brain drain due mainly to a lack of employment opportunities as well as facilities for further education.
7. Most persons are not interested in the few existing local community organizations due to their poor track records and a perceived lack of tangible benefits from participation.
8. The need exists for assistance to develop land where this is available and for land to be made available to those persons without, as well as those with small plots.
9. A number of community and national organizations operate in or have implemented programmes in the watershed. The majority of these groups have worked with the farming community to improve land management and improvement in yields. One of these local organizations BUBADAC, in addition to providing training for farmers, has embarked on some agro-processing using crops produced in the watershed.
10. Despite the general view that the forest should be preserved, a number of persons utilize forest resources for livelihood and recreation. Activities include bird shooting, hunting, farming (mainly coffee) and the removal of trees and their parts.

Recommendations

The needs of the area as suggested by the findings of the study may be addressed by the implementation of strategies encompassing the following items: co-operative land use;

marketing; ecotourism development; agro-industry/processing; employment; and teacher training, and informed by the needs and education levels of the communities. The specific recommendations are presented below:

1. Experiences should be garnered and utilised to educate the current population and the younger generation in areas such as land conservation techniques, land use (current against any proposed change), and management of forest use and protection, particularly where changes in perception are needed. Experiences such as the recent flooding and landslides, which have led to current problems, should be documented on film, photographs and literature and care taken to get the populace to understand the causes and effects.
2. A co-operative way of managing land for cultivation and marketing of produce should be introduced to reduce the impact of severe competition. Examples of co-operation in other communities, which have worked successfully to the benefit of the members, should be highlighted. One good example that could be studied is that of Walkerswood in St. Ann parish.
3. Ecotourism projects could be developed to provide employment and reduce the dependence on the land, hence reducing degradation and the problem of low yield. Such projects need to earn amounts comparable to coffee to reduce the need for converting more land to the growth of this commodity.
4. Research needs to be conducted into the possibilities of alternative pest control methods for crops, particularly coffee, to reduce the effects of pesticides on the water resources of the watershed.
5. More effective methods of managing existing cultivated lands are required to ensure continued productivity and reduce the need for more lands for shifting cultivation.
6. Agro-industries should be developed in the following ways:
 - X agroforestry techniques can be used to improve land management for all crops on slopes inclusive of coffee, in order to improve stability of slopes and thus reduce soil movement down slopes;
 - X the area has a climate in which ornamental plants and flowers thrive well and this could be harnessed in the expanding floral export industry;
 - X crops could be produced for processing for the local and export market and to bring employment opportunities;
 - X training in marketing could be organised and expert assistance given until the community can operate independently;
 - X agroforestry could be integrated into tourism ventures such as coffee shops and gardens and similar scenic ventures.
7. If attitudes are to change in the long run, teachers who work in schools in the area or where children of the area attend should be given specific training, through workshops, into the problems in the area and the methods of addressing them, which they would pass on to their pupils.

8. Whatever programmes are being implemented, the proposers need to be cognizant of the levels of education and gear programmes and language to a level that all the people in the community can comprehend.
9. There needs to be a coordination of all efforts in the area to manage the environment.
10. A long-term effort is needed to improve attitudes towards programmes and organizations that do not always give tangible handouts.

1.0 INTRODUCTION

The interaction between humans and the natural environment is inevitable but can be at times detrimental to one or the other. The effective mix between the use of the natural environment for any form of economic gain or development and the survival of the environment can be attained if man makes a concerted effort to use and not abuse.

This is the major emphasis of the Forestry Department's Trees for Tomorrow Project whose main goal is "*To improve the management and conservation of forest and tree crops for the sustainable benefit of the people of Jamaica.*"

1.1 Background to the Study

Through the European Commission funded project "Building Capacity for Participatory Forest Management in the Caribbean", the Caribbean Natural Resources Institute (CANARI) and the Jamaican Forestry Department implement a project to analyse the process of establishing Local Forest Management Committees (LFMCs), as defined in the Forest Act of 1996, in the Buff Bay and Pencar sub-watersheds. The LFMC comprises personnel from government institutions, NGOs, community groups in the area and Forestry Department staff. Its mandate is to manage the forest within a watershed area. In this light the LFMC is to implement the Local Forest Management Plan (LFMP) through activities including:

- X monitoring of the condition of natural resources in the area;
- X holding discussions and public meetings about the state of natural resources;
- X advising the Conservator on matters relating to the development of the LFMP and making of regulations;
- X proposing incentives for conservation practices in its area;
- X assisting in the design and execution of conservation projects in the area.

The LFMC being a new entity is still in the developmental phase and thus information is still being gathered to inform on how it will operate. The LFMC in the Buff Bay sub-watershed is one of the pilots being used to gather information on establishing LFMCs in Jamaica.

1.2 Purpose of the Study

This study details a characterization of the population in the Buff Bay watershed living in or at risk of falling into poverty and examines existing and potential local benefits from forest resource use. Its purpose is to inform an assessment of the extent to which the LFMC management structure provides the potential to improve livelihoods, particularly of the disadvantaged. With this in mind the study examines *inter alia*:

- X the population within the Buff Bay watershed living in or at risk of falling into poverty;
- X factors negatively affecting economic well-being;
- X avenues through which the poor and at-risk population participate in decision making;
- X forest resources which are of value to, or could be potentially beneficial to, the proposed groups and what would be required to make them available.

1.3 Methodology

In order to carry out the mandate indicated the following procedure was applied:

- 1) Review of available literature concerning:
 - X poverty and its indicators
 - X life in the Buff Bay watershed
 - X forest resources in the area under review
 - X forest use and management in the area
 - X agencies at work in the watershed and their roles
 - X community organisations existing in the watershed and their interactions with the population.
- 2) A quantitative survey of thirty persons from various districts in the watershed to ascertain:
 - X population characteristics - age and gender distribution
 - X portions of the population living in or at risk of falling into poverty
 - X factors influencing and affecting the economic well-being of the population
 - X ways in which the population accesses and uses forest resources
 - X what forest resources could be of benefit to the poor in the area.
- 3) A qualitative study to obtain more detail on the levels of poverty and how people make a living from the environment. Interviews were conducted with available resource persons in the area as well as the population under study.
- 4) Observations so as to glean any additional information that would be of value to the study.

2.0 CHARACTERISTICS OF THE BUFF BAY WATERSHED

2.1 Location and Description

Buff Bay watershed (see Figure 1) is a sub-watershed of the major unit of the Buff Bay/Pencar watershed. It is located in the west of the parish of Portland adjacent to its border with the St. Mary Parish.

The Buff Bay watershed extends from the northern coast at Buff Bay south to where Portland borders with the Parish of St. Andrew in the Blue Mountains at the villages of Mount Horeb and Section.

The mountainous terrain restricts the watershed to a fairly narrow valley, which encompasses an approximate area of 7131 hectares and stretches a length of 24.2 km. Its main town, Buff Bay, is spread out along a narrow coastal strip. The valley extends southwards to a height of 1600m at Silver Hill Peak, the highest point in the valley; Spring Hill Peak, which is about midway up the valley stands at 940m.

2.2 Climate

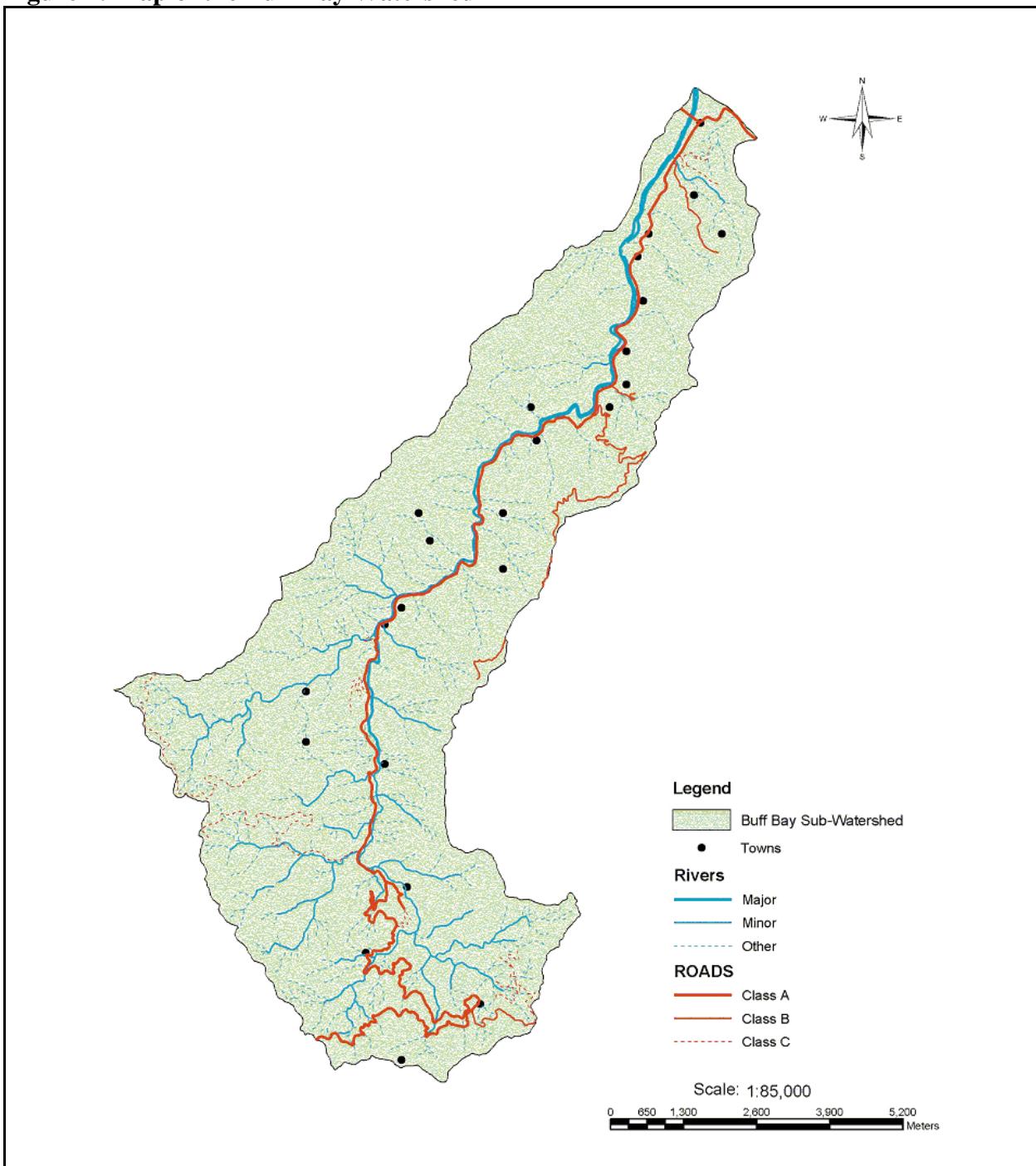
Generally the area experiences cool temperatures and an appreciable amount of rainfall. The heaviest rainfall reportedly occurs between October and February. There is no long drought period, only short dry spells during June to September. Rain falls virtually every day, particularly in the upper reaches of the valley. The prevailing northeast trade winds and the elevation of the area influence the rainfall. These winds are moisture-laden as they travel over the sea. The mountain barrier forces them to rise, thus cooling takes place and the ideal conditions for condensation and rainfall occur. The watershed is in the wettest section of the island.

The area also experiences mist and fog, particularly in the upper section, and these conditions may last for a great portion of the day. Temperatures are low, especially as one moves up the valley, reaching to a low of 21.5 to 24° C. Closer to the coast at Buff Bay the temperature is a bit warmer. The valley thus is ideal for flora and fauna, which thrive well in those conditions. Lush vegetation can be seen all along the valley.

2.3 Geology and Soils

The land has mainly steep slopes, which are quite fragile and prone to erosion. The watershed has had a complex geological past. There is significant folding and faulting among five significant rock types and recent alluvium deposits. The basic rock types combine limestone, shales, sandstone, conglomerates and volcanic rock. Along the valley, outcrops of these rocks are visible. These rocks have been weathered over time to produce fertile soils on moderate slopes in much of the watershed. In the upper reaches the volcanic rocks produce thin soils on steeper slopes due to their harder qualities. Rocks have been eroded to create alluvium deposits by the rivers and streams which are deposited on the lower, more northerly, sections of the valley and along the flood plain.

Figure 1: Map of the Buff Bay Watershed



2.4 Land Use

The area is predominantly forested. There is a range of montane forest. In the upper reaches of the valley there is the upper montane broad leaf forest interspersed with plantations of the Caribbean pine planted under the re-afforestation programmes of the Forestry Industry Development Company (FIDCO) and the Forestry Department. In the areas below 1000 metres, lower montane broad leaf forest predominates, with a mix of Caribbean pine plantation and bamboo plantations.

Among the forest trees and on the lower slope are field crops of yams, cocoa, banana, and plantain, mixed with sparse citrus and red peas. The Number One crop in this valley, however, is coffee. These plantations mix with banana and plantain for shade. Coffee has overtaken all other crops that were important before the 1980s, when the Government of Jamaica divested lands from the forest to coffee plantations.

The area being in the Blue Mountains has the ideal conditions for the world famous Blue Mountain coffee. It is the specific soil types created from the existing parent rocks of the area combined with the nature of the climate and the height of the area that has created the ideal conditions for the island's best coffee.

Absentee farmers who live in the St Andrew parish own large plantations of coffee. Wishing not to be left out the small farmers of the valley diverted their focus on food crops for the local market to coffee cultivation. Today coffee is the major crop produced in the area (see Figure 2).

2.5 The Population

The population of Buff Bay was approximately 2596 in 1991 (Statistical Institute of Jamaica 1994). The population today might not have changed significantly since then due to migration, particularly of the youth. Discussions with a number of persons indicated that young people tend to look outside the valley for employment as soon as they complete school. Those who engage in further studies rarely return. Those who do return, settle in Buff Bay. The Buff Bay population revealed a negative growth rate between 1971 and 1991 of -1.1%. The situation is probably similar throughout the valley.

The opportunities for employment in the valley are few (see Figure 3). No factories or industrial opportunities exist to cater to the skilled and unskilled labour force. The majority of persons are involved in farming either on a full-time or part-time basis. Forty-eight percent of those employed or self-employed are in farming. Trades account for 16% and unskilled labour stands at 11%. The unemployed among the population stands at 10%. The fact, however, is that nearly all persons are involved in farming, as during the reaping time for coffee most family members are involved. Those who are not inclined to farming or cannot earn enough venture out of the valley.

Figure 2: Land Use Map

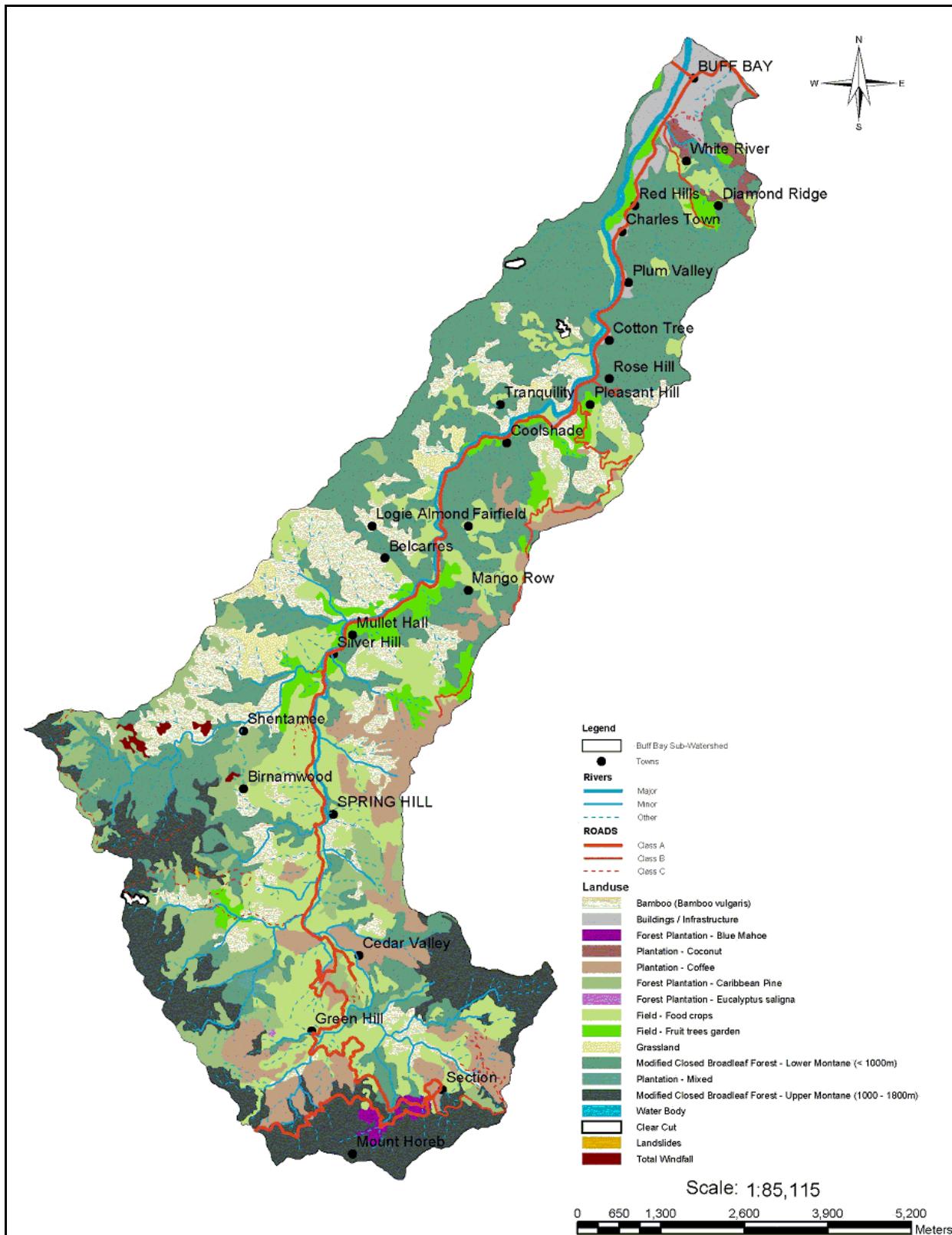
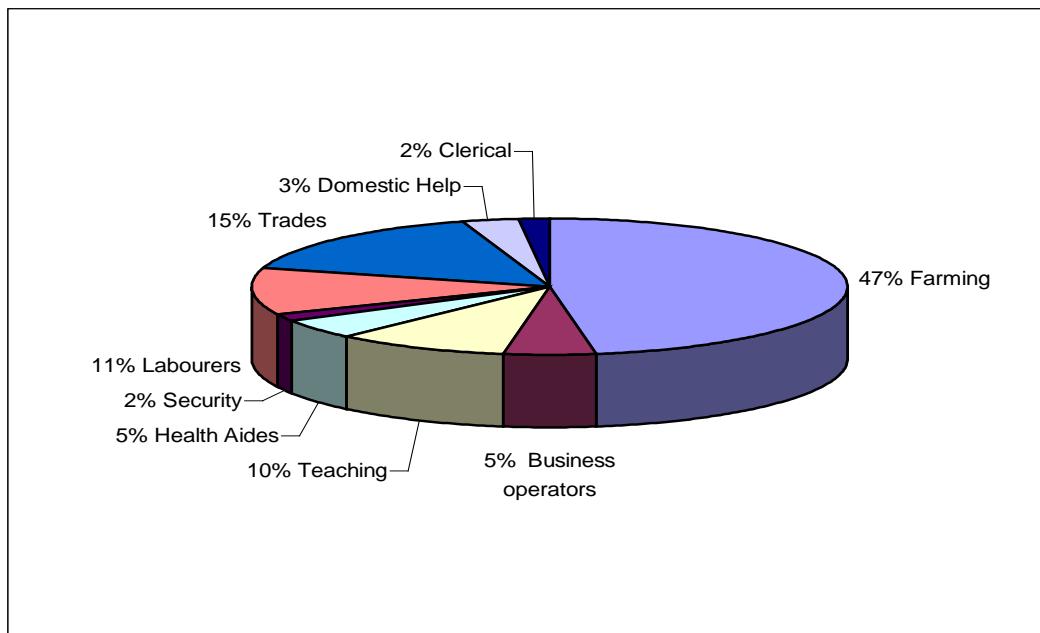


Figure 3: Occupations of household members



The majority of persons in the valley, according to the sample, are thirty years and under. This group accounts for 57% of the population. The working age group, nineteen to sixty years, stands at 50% of the population. Sixty-two percent of the population is female.

As Figure 4 illustrates, children 15 years and under account for 33% of the population. Those 18 years and under form 39% of the population, while 12% are the elderly, over 60 years old.

Figure 4: Age Distribution of Sample Household Population

Age Groups	Frequency	%
0-5	13	10
6-10	13	10
11-15	17	13
16-18	8	6
19-25	10	8
26-30	13	10
31-35	9	7
36-40	3	2
41-45	9	7
46-50	10	8
51-55	8	6
56-60	2	2
Over 60	16	12
Total	131	100

Illiteracy is high. Resource persons in the valley estimate the rate to be approximately 45%, which is above the 1999 national average of 20.1% illiterate and 15.3% basic literate. One reason given for this scenario is school attendance. Although over ninety percent of children are involved in school, they attend irregularly. This is due to a lack of finance in the main to provide for lunch and clothing regularly. The schools assist through a feeding programme and this has helped somewhat. It is the view of school principals in the area that the illiteracy also impacts on the priority placed on education in a number of households.

The principals further are of the view that the lack of finance affects the ability of households to provide books and other learning materials for the children. Assistance with schoolwork at home is limited, as the adults are unable to help due to their low levels of education. In general the children are at a disadvantage in a cycle of poor education.

3.0 SOCIO-ECONOMIC STATUS IN THE WATERSHED

3.1 Economy

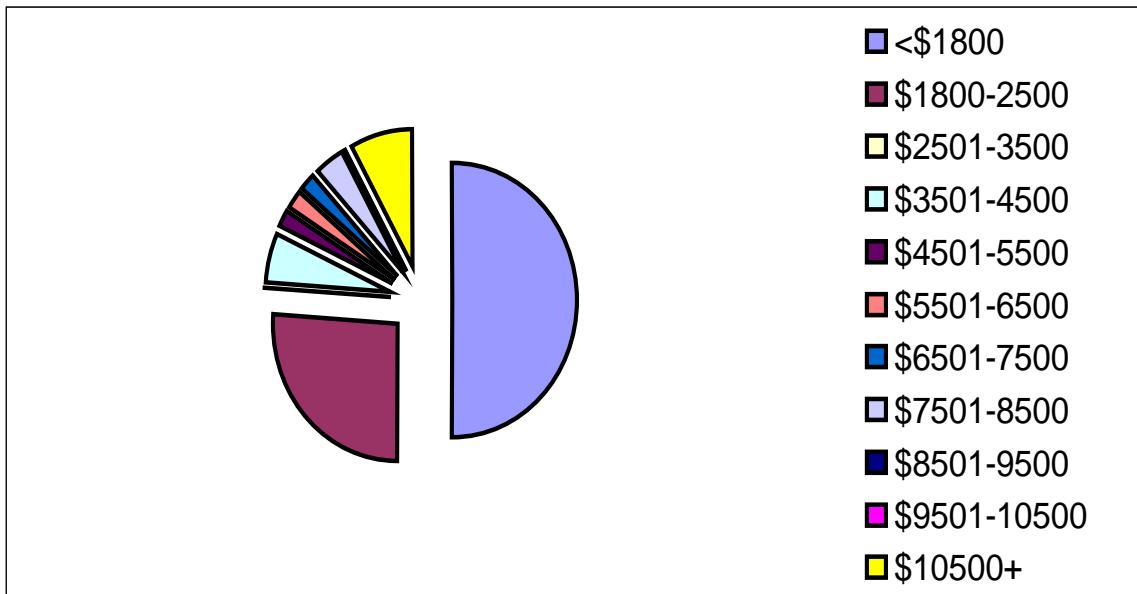
The area depends mainly on agriculture. In the upper reaches of the valley coffee is dominant. It is, however, evident that the greater portion of the income from this activity is exported from the region. Most of the large plantation owners do not reside in the area and so the income earned is spent elsewhere. The many small farmers earn too little from the activity to have any significant impact on the local economy of the area.

The area is bare of any significant signs of development such as factories and major business activities. There are small shops scattered throughout the valley but these appear to be operating at or below subsistence levels in the main.

The principal town of Buff Bay stands out from the rest of the valley. As one moves from the upper reaches of the valley down to Buff Bay the differences are stark. There are pockets of obvious prosperity along the valley, thus some communities exhibit more development than others. Villages such as Spring Hill and Bangor Ridge are the more developed in the upper section of the valley. Buff Bay is more bustling with activities and opportunities for employment outside agriculture. The opportunities are, however, inadequate to cater to its larger share of the valley's population as well as that of the villages.

Overall, incomes in the valley are low, both for those who are self-employed and those who are employed. As Figure 5 depicts, a staggering 76% of the surveyed working population earns two thousand five hundred dollars or less when computed weekly. Only 10% of households earn in excess of seven thousand dollars weekly, with 6.6% earning over ten thousand dollars weekly.

Figure 5: Weekly income

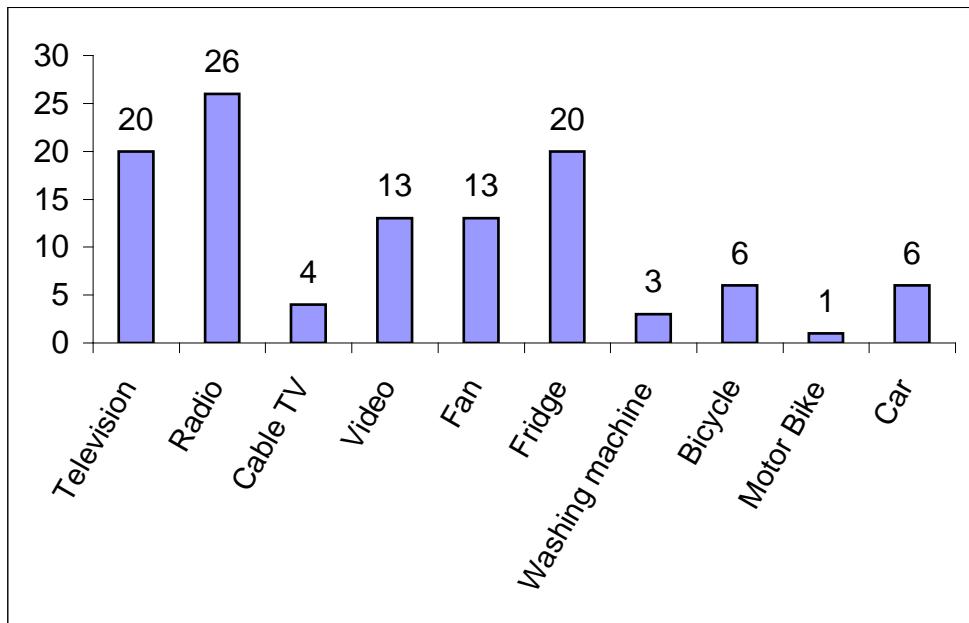


Only 10% of the sample indicated that their household earns enough to meet its needs.

This assessment is further supported by the fact that over the thirty-day period up to the time of the survey, the majority of households, 63%, spent earnings mainly on food. Those spending on luxury items such as motor vehicles and household furniture stood at 3.3%. School travelling and lunch accounted for major expense of 16.6% of households. This situation could result from an inability to spend on luxury items due to lack of income, thus confirming that the majority of persons earn subsistence or below subsistence levels of income.

Electricity is available throughout the valley; however, there are households without a television (33.3%), which is virtually commonplace in Jamaican households that are at and above subsistence levels of income. Only 20% of households own a motor car, 3% a motor bike and 20% a bicycle. A refrigerator is owned by 67% of households. A general utility of luxury items indicated in Figure 6 could support the fact that incomes are generally low.

Figure 6: Utility of luxury items



3.2 Social Status

An examination of income, consumption of luxury items, the ability to provide basic consumption items and educational attainment in the Buff Bay watershed could lead to basic assumptions on the social status of the area which would fall close to if not at the reality.

These indicators all point to a large portion of the population living below, at or close to subsistence levels. The national indicator of poverty, the poverty line, stood at \$136,949 per annum in 1998 using a reference family of 5 persons. Given that average household size is 5 persons in the surveyed sample, 32% of those stating an income could be considered to be at risk of falling into poverty or are below the poverty line. Another approximately 20% could be considered close to the line, just being able to subsist. Indeed only 10% of households said they earned enough to meet their needs.

Educational attainment impinges heavily on living conditions. Both variables affect and depend on each other. As reported by Professor Clive Thomas in the Survey of Living Conditions 1998:

“The association between poverty and educational attainment, however, is so strong that living conditions in Jamaica will not improve if educational attainment by households does not.”

The stark reality of this situation exists within the Buff Bay watershed. The majority of adults in the area did not attend school beyond the ninth grade and only approximately 4% (within the national average) have a tertiary level education. The households where these persons reside fall in the approximately 10% earning incomes which allow needs to be met and for the comfort of luxury items. Of the children in the watershed 51% live in households that are poor or close to

the poverty line. Discussions with a number of the more highly educated in the area, as well as school heads who live in the watershed, confirm the findings that the level of poverty is high.

Fuel use is another indicator of socio-economic status. In the sample 10% of households utilize only wood or charcoal for fuel. The majority, 57%, use gas with wood or charcoal as fuel.

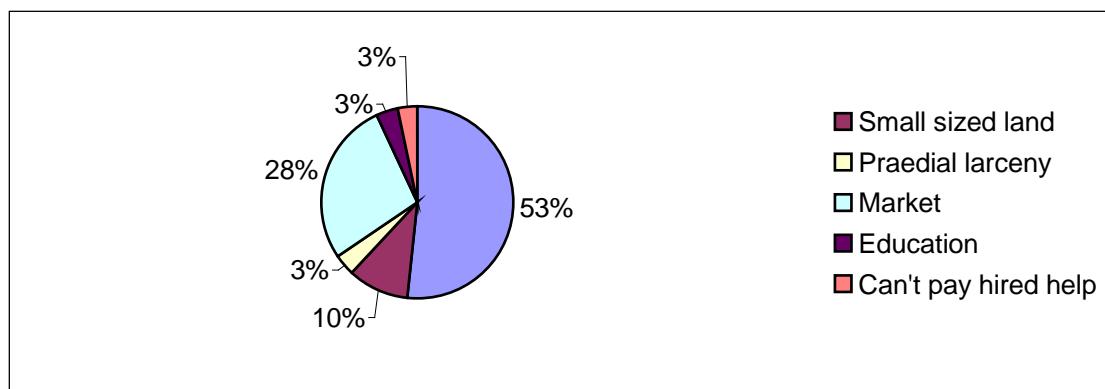
Most households (66.7%) have piped water whether in their yard or in the house. Approximately 30% of the households use a community standpipe. In relation to toilet facilities 40% utilise a water closet, the others use pit latrines.

4.0 FACTORS AFFECTING ECONOMIC WELL-BEING

Factors that which are inevitable or those that are apt to change can determine the economic well-being of a people. Man can be a master of his destiny. Among the factors impacting well-being are market access, availability of and access to resources, natural disasters, education and skills.

In the Buff Bay watershed the major factors affecting well-being of the sample surveyed, as seen in Figure 7, are availability and use of the land, access to markets, and levels of education. In addition migration and the limited avenues for development are constraints to improvements in the area. Persons in 20% of households in the area receive Food Stamps given by the Ministry of Welfare and Social Security. These are given to persons earning below the minimum wage of \$1800.00 per week (pregnant and lactating mothers are included in this category) and elderly persons not in receipt of a pension.

Figure 7: Factors influencing family well-being



4.1 Land Use

Land in the Buff Bay watershed is in the main owned by the individuals who occupy it. Approximately 25% of the farmers own the land on which they farm and 41.7% operate on family land. In contrast 80% own their dwellings, 10% live in family owned dwellings and 10% rent or lease. In most instances farming takes place on land where the dwellings are located. In addition land is cultivated at other locations away from the dwelling.

The problem faced by a significant number of farmers is that, despite the fact that land is owned or is available for use, it is in their view not sufficient to boost their income. Of those who said they did not earn enough from their activity to meet the needs of their household, 80% are farmers. The scenario of insufficient income could be due to two main factors. In the first instance the land on which the smaller landowners operate would yield less based on sheer size. Secondly the land could be yielding insufficiently per unit area as a result of improper use of the land as well as natural factors.

Improper use refers to the observed lack of soil conservation methods. With most of the areas under cultivation in the watershed existing on steep slopes, soil is lost through erosion. Coffee with its shallow roots would not hold the soil to reduce the levels of erosion and mass wasting,¹ as would larger trees. The other food crops cultivated, particularly in the upper reaches of the valley, pose the same problem.

The local extension officer from the Rural Agriculture Development Agency (RADA) confirmed that the majority of farmers do not practise conservation methods or do so inadequately. This is due in part to tradition. These farmers were reared on certain practices and feel they know what is best for the situation. They do not believe in the modern trends in land practice. This is due to their inability to see the problems that have developed over time and that they will continue to experience if they do not implement methods to conserve the soil.

The natural factors operating in the area include soil loss and leaching. In addition due to the influence of the topography, especially in the highlands, most soils are shallow. Limbard *et al.* (1993) confirm this. Siltation in the lower levels of the valley would attest to the levels of soil loss. On travelling through the watershed one observes the areas of exposed parent rock with accumulations of weathered and eroded materials at the base of a large portion of the slopes. The flooding of the valley in November 2001 is evidence of resultant degradation in the area and of poor soil conservation practices. The RADA officer was of the view that those farmers who implemented soil conservation techniques suffered little or no damage from the flood rains of November 2001, the worst the watershed has ever experienced if the records are indeed correct. The conclusion here is that low yields per area are due to farming practices.

Another factor affecting the ability to earn more is the insufficient use of available land. A number of the farmers interviewed attest to the fact that idle land exists in the area. The inability to utilise these lands stems from two factors. One of these is the lack of finance and the other is a lack of interest in farming or the inability to get hired hands. This is so particularly since the advent of coffee, since potential labourers who have access to land have been getting involved in their own production and working for large absentee coffee producers.

Those farmers who identified finance as a deterrent to increased production said they would produce more if they could cultivate all their land. Some said they are unable to utilize all available land because they cannot afford to pay hired help.

¹ The movement of rock debris down a slope due to the saturating action of rainwater under the influence of gravity.

4.2 Market

Market access is considered to be a factor influencing well-being in the Buff Bay watershed by 28.6% of persons. However, this is a problem mainly for persons who are not coffee producers. This group includes livestock producers, shopkeepers and producers of food and other cash crops. For shopkeepers there is competition. There are too many shops in proportion to the population in each district. In addition some persons do their purchasing in the main town of Buff Bay for variety and competitive prices.

The problem for farmers of products other than coffee is that the sale is dependent on the fluctuations in demand as well as the volume of supply from other producers. Coffee, however, has a ready market for whatever is produced and an attractive price. Farmers do not have to worry about getting to the market as the Coffee Industry Board (CIB) comes in the valley and collects the produce.

4.3 Levels of Education

Levels of education of the population in the watershed impact on people's ability to best utilize resources. As mentioned earlier, the majority of persons in the area do not have formal education beyond age 15 years. Most of those involved in farming (90%) fall in this category. The correlation between education and well-being is implied in the discussion on land. The lack or low levels of education are in part responsible for the adverse reactions to programmes of the agricultural ministry through its extension officers. In addition general educational levels impact on people's ability to rationalize and take actions to address problems.

Throughout the discussions with the residents in the watershed it was observed that a great number of them wanted imported assistance. Hence, they would say they could not develop their land because they need help from Government or some agency in the form of money or some materials.

The level of education of residents affects development in the area. Also, many residents feel agriculture is degrading and so do not wish for their children to be involved in this activity as their main profession. Coffee, which has become the major crop in the area, is very lucrative. The best coffee in Jamaica is obtained in this region and is yearned for worldwide. The general impression is that people see their offspring as doing some "white collar" jobs. The schools even have difficulties trying to teach areas such as agricultural science or other skilled areas as parents object to their children learning these. They feel it is degrading.

The population in the schools is small, with the largest school having 290 students on roll. Initiatives could be implemented to improve levels of performance of students. The impression obtained is that the majority of the teachers are not making the requisite effort to lift the standards in the school so as to inspire change through the children. One gets the feeling that, while there are problems with co-operation from parents and the inability of parents to help the children, the schools are not being the agents of change that they should be. This could stem from frustration on the part of teachers due to a combination of factors including the lack of adequate resources in the schools, irregular attendance of the children and inadequate parental support.

4.4 Migration

Migration often ultimately results when persons do not see opportunities for self-advancement. People will go to where they believe they can earn to survive, or see upliftment for themselves. Migration out of the area can be seen as a factor affecting its general development, especially since the young are the ones moving out in the main.

The general census figures appear to indicate negative growth in the population of the watershed. Figures for districts in the watershed are not available; however Buff Bay had an average growth rate of -1.11 % for 1970-1991, whereas the rate for Jamaica was 0.9 % in 1991 and 1.0 % in 1992. The parish of Portland had a rate for 1991 of 0.27%, down from its rate of 0.73 % for 1982. In fact Portland has one of the lowest growth rates of any parish in the island. Based on current observations Buff Bay might see signs of growth in the 2002 census; however, generally the valley will have no growth or negative growth.

It is those who have made strides in education that appear to migrate. Those who go out of the area and the parish for high school and further education do not always return as the opportunities to get employment in their areas of speciality do not exist or are limited. When the brightest minds leave, it becomes difficult to spur development and to thus ultimately end the vicious cycles of poverty and dependency that exist in the watershed.

5.0 AVENUES FOR PARTICIPATING IN DECISION-MAKING

In any society it is important that people feel that they have a say in whatever is planned for them. In this way projects will be better supported and ultimately be more likely to succeed. A number of community groups exist in the watershed; however, the majority of these appear to be inactive. In addition there are support groups as well as groups from Government and non-governmental agencies. Existing groups and organisations in the region, in addition to the LFMC, include agencies such as the Jamaica Agricultural Society (JAS); Buff Bay Action Development Committee (BUBADAC); the Portland Environmental Protection Agency (PEPA) which runs special projects in the area occasionally; civic groups such as the Kiwanis Club and community groups such as citizens associations, past students associations and youth clubs.

The institution with the greatest participation and membership in the watershed is the church, which is an integral part of the life of residents. This follows the general trend for Jamaica, where priority is placed on church attendance. The study data reveals that 73% of households have members who belong to a church. Travelling through the valley on a Sunday in particular gives the appearance of a ghost town, as virtually everyone is in church. Any programme planned for the area should reach the majority of residents if there is involvement of the churches. Currently some churches are involved in community services, mainly of a social nature.

A number of communities have a citizen's association, which is linked to the school where they hold their meetings in most instances. Linked to the schools too, particularly in case of the larger schools, are past students associations. The schools play an integral role in the life of the communities. Apart from teaching the children, the school serves as a centre for a number of meetings and activities. Hence the principals and teachers interact constantly with members of the community.

Fifty percent of households have members who are involved in activities in their communities. Involvement ranges from sitting on the executive of community groups to assistance with projects. A small minority attend only the meetings.

The JAS chapters work with the farmers. Their main role is to teach organizational skills to farmers to enable them to better manage their business and be involved in community organizations. They work too with the farmers to improve their farms and properly care for crops to ultimately improve the quality and quantity of their harvest. The aim here is to increase incomes and thus improve living standards. Their work includes training in land husbandry, where farmers are taught how best to farm on slopes and contribute to improvement in water quality. The JAS is organized by farmers and receives funding from government.

RADA, a government body, works through extension officers who engage the farmers of the area in land conservation practices. The Coffee Industry Board also works with the farmers at improving quality and helping farmers deal with problems with the crop. The JAS, RADA and CIB have their main offices outside the area; however, members of the communities in the valley serve as liaisons between these agencies and the communities.

The Jamaica Conservation and Development Trust manages the Blue Mountain/John Crow Mountain National Park, part of which is in the upper reaches of the watershed. Its work involves educating the communities on the importance of the forest and the need for conservation of its resources. It is responsible for forest wardens who protect the resources of the national park. It has set up and monitors recreational areas in the Blue Mountains. Its office is outside the area, but residents of the watershed are employed in its activities.

BUBADAC, an organization in the Buff Bay community, has done extensive work in the valley including:

- X setting up nurseries in some schools in the valley to produce and supply seedlings to farmers in the area;
- X training for 200 farmers in soil conservation methods such as trenches, hillside ditches, and waterways to prevent soil erosion;
- X the cultivation of fruit trees to make juices and preserves, as well as for honey production;
- X solid waste management workshops for farmers, housewives, students and teachers.

They have also been involved in other support programmes such as the provision of agricultural equipment and materials to schools and painting of schools. A number of persons in the survey mentioned the activities of BUBADAC in the valley. Their impact seemed to be far-reaching as most persons mentioned their contribution.

The National Environment Planning Agency (NEPA) is another organization well known in some parts of the area and particularly the Bangor Ridge community and its environs. Their work has included sensitizing the community to the importance of protecting the watershed. The name NEPA being new is not known the area but its former name NRCA is prevalent and visible

in the conservation signs it erected. NEPA is the government agency with responsibility for environmental management and monitoring in Jamaica.

A number of persons within the watershed are involved in community organizations. The problem expressed, however, is that except for the churches, these groups are in the main inactive or receive very poor support from residents. The poor support, the residents said, is due to their being disillusioned with little or no positive action in their opinion. Executive members of some of the organizations were spoken to. In their opinion it is the lack of committed participation from residents that leads to inactivity.

Overall this scenario might be one of the results of the level of education in the area, which results in a significant proportion of residents not perceiving the real benefits to be gleaned from participation in these groups. It would appear that where benefits are intangible persons do not believe that anything is achieved. During the survey when asked how they benefit from involvement in their organizations, a number of persons said they did not get anything. However, when prompted they were able to cite intangible benefits. The lack of perceived benefits leads to apathy and lack of interest in the organization. What is needed is a change in the perception that one must receive something in one's hand as a benefit.

The Forestry Department (FD) has responsibility under the Forest Act for the island's forest resources. In its role of protecting and monitoring it is working closely with the communities in the Buff Bay sub-watershed. Most persons in the valley are aware of and commend the work of the FD; however there are criticisms. A number of persons feel that the Department should do more than setting up experimentation plots, offer more in terms of plant nurseries in the area to distribute seedlings to farmers and be more visible in their monitoring.

There were accolades for the Trees for Tomorrow Canadian staff, who people felt were more active in the area than the FD is currently. Mention was made of FIDCO in its role of employing persons from the area to work in cutting and replanting exercises. In fact some persons today believe they are still responsible for the forest. FIDCO stands out in their minds possibly because they got tangible benefits from its operations and they see the impact of the reforestation work.

The LFMC is in its embryonic stages and as it draws its membership from the groups existing in the area this should help to bring new life to these groups as its activities mushroom. Currently as Figure 8 reveals, awareness of the LFMC is low. Of the population in the survey only 37% were aware of its existence. Of these, 64% have attended meetings (Figure 9).

Figure 8: Awareness of LFMC

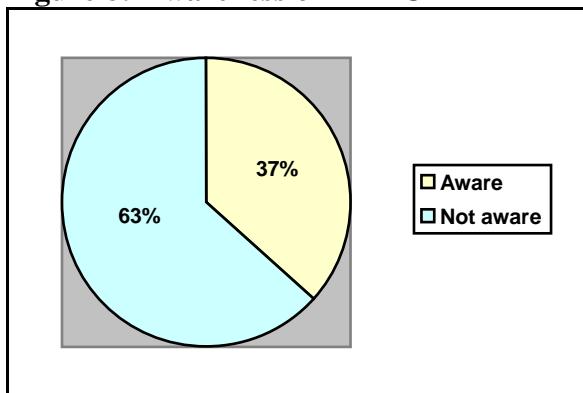
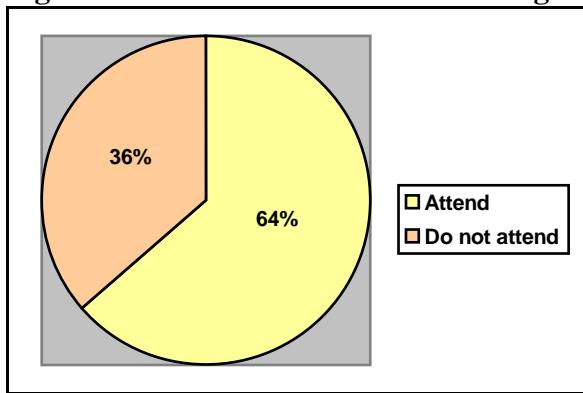
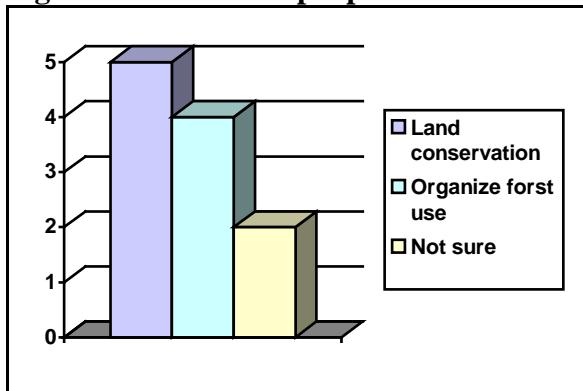


Figure 9: Attendance at LFMC meetings



Since the LFMC members are in the main the heads of the existing community organizations it can be confidently assumed that they on the whole do not adequately sensitize their membership and communities to the Committee's existence and purpose. The persons who expressed awareness of the LFMC do not seem to be fully cognizant of its purpose. This could be the reason more persons in the community are not aware of the LFMC. Of the respondents seen in Figure 10, 45.4% said the purpose of the LFMC is to give assistance to farmers in land conservation, 36.4% said it is to organise forest use, and 18.1% were not sure of its purpose.

Figure 10: Perceived purpose of the LFMC



6.0 THE ROLE OF FOREST RESOURCES IN LOCAL LIVELIHOODS

It is the general view in the watershed that the forest is important in the sense that it contributes to stability in the environment. Nearly all respondents were aware that they live in a watershed. This knowledge was obtained from their parents and community members in the main and organizations such as the NRCA, now NEPA.

6.1 Past and Current Use of Forest Resources

Both residents and non-residents use resources of the forest in the Buff Bay watershed. This use is, however, not as prevalent today as in the past, as the forest is monitored by wardens. Absentee coffee farmers own large tracts of land, which was formerly forestland. This they obtained through the government under an expansion programme for coffee in the 1980s and 1990s. Small farmers in the basin, probably due to a lack of finance, do not appear to have benefited from these land deals. If there was any benefit it appears negligible. Those who use resources of the forest do so without permission in most instances.

The use of forest resources does not appear to be prevalent. In fact only 6.6% of respondents said they use forest resources. The response to the use of specific resources gave contrasting figures. The picture conveyed is that there is a significant use for the recreational purposes of bird shooting and hunting for wild pigs. Mainly non-resident upper class persons as a hobby do bird shooting. The licenses are issued for the activity by the NEPA, whose agents monitor the number of birds killed. Locals participate in pig hunting in the forest. These activities were alluded to by 56.6% of respondents.

The responses as to whether land, trees, fruits, flowers and water were used by locals revealed that the land and trees were mainly utilised with land being the more used. Land usage was alluded to by 40% of respondents, whereas 23.3% said trees were used. The significance of the use of land compared to trees stems from the coffee production syndrome. Land was required for planting coffee and those who had little or no land encroached on Crown Lands for what they needed.

Most residents, it appears, do not really want to use the forest. A total of 63.3% of residents surveyed said they did not want to use the forest resources. This is so for a number of reasons such as the perception that trees play a significant role in protecting the land from degradation, contributing somewhat to rainfall (through transpiration and encouraging percolation of rain water, thus increasing ground water storage and ultimately stream flow). This serves to provide water for use by communities in the watershed as well as others served by the Buff Bay River and adjoining watersheds. While not using sophisticated terms the residents alluded to these reasons. Residents too have been discouraged from utilizing the forest by the forest officers and wardens.

Of those who express the desire to use resources of the forest some encounter difficulties doing so, while for others no obstacle prevents them. Some 23% said they have no problem accessing resources of the forest, while 13% said they have problems doing so. A significant 63% did not try to use the forest resources and so could not express an opinion in this regard. Despite this

however, 43% of persons felt that the community benefits from the forest but 23% said that they could benefit more.

From discussions with residents in the watershed it appears that persons who do not reside there remove trees from the area in greater quantities than locals do. There is also the feeling that outsiders are not aware of the significance of maintaining forest resources so do not remove trees with care or systematically replant.

6.2 Accessibility and Potential Benefits of the Forest Resources to the Poor

Conclusions drawn through the survey are that today land is of great importance to the residents of the Buff Bay watershed and the majority of persons have access to land to plant coffee and other crops. The needs appear to be for assistance to develop and properly utilize the lands to attain maximum benefits. There is need for land for those who do not have land or have but it is not sufficient. These groups, though small, consist of the most vulnerable in the valley.

Despite the fact that some residents (6.6%) use land and other resources in the forest, the general perception is that they would rather not encroach on these lands. They are aware it is not theirs and the majority (50%) said they did not want to use it. Forty-six percent of those who would use forestland or trees do not do so because they have no permission; another 23% want to use but do not know how to get the permission. Yet another 23% are prohibited because of the lack of money or transport.

Access to forest areas is not as easy as in the past and this might be what deters persons from utilizing them. If access to the resources of the forest were allowed, one-third of those in the sample indicated that they would want land to plant mainly coffee and 6.6% would wish to cut trees. The perception of a small number of persons is that people should be allowed to cut trees and replant immediately to replenish the areas cut.

6.3 Proposal for Land Use

The need to use land in the watershed is prevalent, and there is a lack of alternative income earning activities. There is therefore the need to implement measures that would prevent or significantly reduce degradation of the environment beyond a level that can be naturally restored. In order to do this the following would be required:

Education

A concerted effort should be made at educating the populace as to the impact of degradation on the environment and the population, both human and animals, through:

- X education on the importance of biodiversity to the watershed and the impact of its disturbance
- X inclusion of management of the local environment into the curriculum of schools attended by children who live in the watershed. This should include activities for reinforcement and citing of examples of activities that cause damage of the environment as against activities that are implemented in an environmentally friendly way

- X creation of a documentary showing the impact of the misuse and abuse of land in the area, including the devastation of the November 2001 flood rains and the possible causes, to be utilized in education programmes
- X the possible creation of monuments using some of the destruction of the floods to serve as vivid reminders of the impact of degradation.

Planned and controlled land use:

As alluded to in a number of studies and position papers previously done² there is a need for planned and controlled land use. Measures that could be taken in this respect include:

- X the encouragement of agroforestry, which is key to preservation of the environment in the area and has the potential to increase incomes through the variety of items for possible sale
- X controlled distribution of land to those who need it with exemption of areas with steep slopes
- X monitoring and incentives for proper land use, which could be in the form of inputs for the farm, assistance in marketing of crops where this is not now given, scholarships for studying agriculture and improvement in general education
- X the development of ecotourism and other livelihood ventures where these will not cause strain on the environment.

6.4 Community Participation and Forest Management

The input of community members in planning and implementing of programmes is imperative and would encourage support of these programmes. Here the LFMC if properly developed would be ideal. The survey revealed that most persons would be willing to participate in managing the watershed. Of the respondents, 80% said they would be willing to participate in any management of the forest. Eighty-six percent of these persons felt that a combination of government and persons from the community should decide on the forest use. Only 6.6% felt government by itself should decide on the forest use.

Some members of the valley communities are currently involved in organizations that work at forest management in the area directly; however more persons should be integrally involved in this exercise so that the resources of the area could be further developed for the benefit of themselves and future generations. The challenge is for organizations like the LFMC to expand its reach into the consciousness of the population it wishes to serve.

As aptly said by Hall (1995), "Local communities and local people are an integral part of the forest management problems and opportunities and they are a key component of any successful solution."

²Formation of a Local Forest Management Committee (2000)
 -Eckman (1997)
 -Limbard, *et al* (1993)
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