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**The Exploitation and Conservation of Prunus Africana In the  
Mount Cameroon Region of Cameroon**

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## **Abstract**

The exploitation of natural resources in general and biodiversity in particular by human beings, is remarked to be associated with unsustainable practices that place the survival of these resources at stake. An assessment of the exploitation of *prunus africana* around the mount Cameroon region can be linked with the trend of unsustainable exploitation prevailing in other parts of the world. *Prunus africana*, is a tree cherished by the local population for its varied values, with its medicinal values propelling it to international popularity. This has been characterized by the massive demand for its bark by western pharmaceutical companies. The huge demand of the tree in the international market is remarked to be major factor that contributed to the tree's mass unsustainable exploitation by the local population in the studied region. This paper has looked at the factors responsible for the mass unsustainable exploitation of *prunus* and the measures that local based organizations, MOCAP-CIG and MCP had adopted to promote participatory management of the tree. Three major factors; poverty, the issuing of 50 exploitation permits and international demand were identified to have contributed to the involvement of the local population in unsustainable exploitation of the tree. The concept of sustainable development was used as the theoretical framework to examine if the three dimensions can be attained without one affecting the other. The results showed that it is quite difficult to achieve this especially in the case of the exploitation and conservation of *prunus*.

**Keywords** : Exploitation, conservation, *Prunus africana*, participatory management, plantecam, sustainable development.

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## List of Abbreviations

CITES- Convention on International Trade in Endangered species of flora and Fauna.

CBD-Convention On Biological Diversity.

DFID-UK Department for International Development.

GTZ-German Technical Cooperation.

IUCN- International Union for the conservation of nature and natural Resources

MCP- Mount Cameroon Project.

MINEF-Ministry of Environment and Forestry

MOCAP-CIG- Mount Cameroon prunus management Common Initiative Group

MINEF-Ministry of Environment and Forestry

PBCS- Participatory Biodiversity conservation strategy.

SD-Sustainable Development

UNDEP- United Nations Environmental programme

## Introduction

The world is increasingly plagued with numerous environmental problems ranging from deforestation, global warming, ozone layer depletion and air pollution, just to name a few. The destruction of the tropical forest has dire consequences with the most prominent being the extinction of animal and plant species. The main factor identified to be responsible for this, is the impact of modern industry and technology on land use (Anderson 1997: 3). Krishna Rao (2000:7) pointed that the process of industrialization has led to rapid deforestation and urbanization, which has had tremendous impact on land cover, biodiversity and the biosphere. Environmental destruction caused by human activities has exacerbated over the years. International environmental concerns gained momentum in the 1970s. This was marked by the holding of the first United Nations conference on Human Environment in Stockholm, Sweden in 1972, and the publication of the Club of Rome's report on "Limits to Growth" (Sandell et al. 2003: 5).

The felling down of trees for human consumption and for the establishment of industrial plants has triggered severe problems such as desertification, land erosion, and the extinction of plant and animal species, raising the concern for the conservation of these endangered species. This has been the goal of environmental pressure groups like Greenpeace that advocates for the conservation of plants and animal species in order to preclude their extinction (MCNair 2002:9). The indiscriminate exploitation of the *prunus africana* tree around the Mount Cameroon region can be associated with the trend of environmental degradation prevailing in the world. The mass exploitation of this tree has accounted for its declining population in Cameroon and other parts of Africa where it is found. The rampant and indiscriminate exploitation of the tree has spurred the fear of its possible extinction if the various actors involved do not take stringent measures. The overexploitation of biodiversity has resulted to the creation of numerous international environmental regimes whose objective is to promote the regulation of exploitation, conservation and trade of biodiversity species. The most prominent of these regimes are; the Convention on Biological Diversity (CBD) and the Convention on International Trade in Endangered species of wild Fauna and flora (CITES). The outburst of huge exportation of the tree's bark into the international market resulted to its inclusion in Appendix II of CITES in 1994 (Stewart 2003:2). The appendix states that imports and exports have to be declared, with the exporting countries required to demonstrate that their quotas have been set at levels that do not adversely affect the species. Its

inclusion in this appendix implies that it is not yet threaten by extinction, but would be if its trade is not checked (Nsawir & Ingram2007). CITES works in tandem with other international environmental regimes with respect to conserving wild life (Lanchbery 2006:157). As of 1995, CITES has been regulating *prunus africana* trade in the international market. Ben Page (2003:364) upholds that it was included in CITES, as a specie if not yet endangered, needs keen observation and controlled harvesting. International concern about the decline in the population of biodiversity increased following the recognition of the decreasing number of whales, pandas etc. This created an awareness of the risk these species face of extinction if measures were not put in place. The loss of biodiversity has been cited to adversely affect the productivity of the ecosystem, which has inherently led to an increase in floods and storms.

### ***1.1.1 Research Problem***

The diminishing population of the tree in the mount Cameroon region in particular and in Africa in general, has been triggered by the advent of commercial exploitation and unsustainable harvesting methods. The interesting thing about the exploitation of *prunus africana* in the mount Cameroon region is that, in spite of the concerns that have being raised regarding the danger or repercussion that mass exploitation impact on the tree's existence, this has not precluded the population in the area from still indulging in its exploitation. The exploitation of the tree is associated with the problem of mass unsustainable exploitation practices. This paper will attempt to assess the factors responsible for the advent of large unsustainable harvest methods. Unsustainable exploitation practices are identified to be detrimental to biodiversity. Christian Asanga, a representative of the department of forestry was compelled due to the outburst of huge exploitation of the tree to state that "*prunus africana* was a common tree in Cameroon, but is now becoming scarce due to unsustainable harvest" (Page 2003:364).

According to Dr Rashiid Qaisirani (2000), sustainability is a basic goal of natural resource management, the achievement of greater integration of environmental, economic and social values in resource management. The issue of conservation is closely tied with the process of sustainable resource management. This paper will seek to justify the fact that a successful conservation of the tree requires a participatory approach, which is based on the notion that the involvement of the local community is vital. Dharam Ghai & Jessica Vivian (1995:1) point that managing resources at the local level is one of the prerequisites needed for achieving the goal of global sustainable development. They perceived local participation as an

intrinsic part of sustainable development (Ghai and Vivian 1995:2). As portrayed above the severity of the problem of the tree's exploitation may not necessarily compel the people exploiting the tree to halt their action or propel them to address the problem.

### ***1.1.2. Aim and objective of study***

The aim of this paper as portrayed from its title is to examine the issue of the sustainable management of *prunus africana* in the Mount Cameroon region. In order to provide comprehensive information on the subject under study, various issues would be of interest to examine. This includes; an examination of the factors responsible for the outburst of the tree's exploitation, an assessment of the approaches that the various stakeholders notably local based organizations that advocate for the tree's sustainable exploitation like Mount Cameroon project (MCP) and Mount Cameroon Common initiative group (MOCAP-CIG), as well as the local population have adopted to address the problem.

This paper also seeks to examine the benefits the tree's exploitation renders to the various stakeholders and their communities at large. To examine the exploitation and conservation of the tree, this paper is structured around the concept of sustainable development, basically because it is concerned about natural resource management. It will be viewed from three dimensions that is ecological, economic and social sustainability. Richard Wright (2005:9) considers ecological sustainability to be associated with the issue of resource management. In this paper it is viewed in relation to the various conservation measures that have been adopted to halt indiscriminate exploitation. Economic sustainability is often linked with the issue of growth and maximum utilization of resources in order to obtain maximum benefits. In this paper it is assessed in relation to the trade in the tree. Richard Wright regards Social sustainability to be centered on equity, human needs and cultural identity (Wright 2005:9). It will be viewed in terms of the social benefits derived from the tree's exploitation.

### ***1.1.3 Research Questions***

The research question is divided into two parts; the main question and the sub research questions. The main question embodies the base of the research, while the sub questions serve as guideline that is they will help to provide answers to the main question. With that being said, the main question I formulated is; why is the exploitation of *prunus africana* still persisting despite the negative repercussions it has? To answer this question, the following sub questions were formulated.

- 1.What factors led to the advent of large unsustainable exploitation in the region?
- 2.How has the conservation of the tree being approached by the various actors concern?
- 3.What are the benefits associated with its exploitation?

It is pertinent that I provide an outline of the main issues that each of the questions will address or how they will be approached. The first question is centered on identifying the push factors that propelled or set favourable grounds for the large-scale involvement of the inhabitants in the exploitation of the tree. The second question will seek to assess the various approaches that local based organization notably MCP and Mocap-cig in collaboration with the local population have adopted in a bid to address the problem of unsustainable exploitation. It will in addition, provide information on the various unsustainable and sustainable exploitation practices employed in the harvest of the tree's bark. Lastly, the third question is focused on providing information on the various benefits associated with the exploitation of the tree. This will be perceived from two facets; social and economic.

#### ***1.1.4 Importance of study***

Most previous studies that have assessed the exploitation of *prunus*, have considerably focused on identifying the factors responsible for its mass exploitation. The prominent thing that distinguishes this study from previous studies conducted on the subject is that it would attempt to address the issue from a holistic dimension. What does this imply? This means that it will assess the issue from a social, economic and ecological facet. Thus, it does not only seeks to examine the causal factors responsible for the tree's indiscriminate exploitation like most previous studies have done, it will also look at the measures that have been adopted at the local level to ensure that sustainable exploitation of the tree prevails. Furthermore, this study can be used as a base for further research on the subject.

#### ***1.2 An Overview of the Concept of Conservation***

The concept of conservation is usually associated with the issue of resource management. Pinchot viewed resource conservation as "equivalent to the wise and prudent use of resources" (Meffe 2002:57). By this he implied conservation should embody the efficient and fair use of natural resources that guarantee their availability to the present and future generation. Pinchot further adheres to the idea that "the first great fact about conservation is that it stands for development" (Rao 2000:7). A broad definition of conservation, views it as the means of using natural resources in ways that ensure their availability to the future generation (Jim Igoe 2004:10). Pinchot further associates the issue of conservation with the

process of sustainable development. By this, he meant that the felling down of a tree should be proceeded with the replanting of a new one. From the information so far provided, the conservation of *prunus africana* can be considered to embody the process of natural resource management.

The concept of conservation is most often confused with the concept of preservation. It is therefore pertinent to make a distinction between the two. Graham and Connelly (2003) in the book *Politics and the Environment*, point that conservation connotes the management of existing natural resources through human intervention. Hence, it embodies the notion of saving resources for later consumption, as well as ensuring that natural resources do not result to extinction due to human activities and consumption. The concept of preservation on the contrary is centered on “keeping natural resources as they are without human intervention or interference”. It encompasses the idea of halting the prevalence of adverse consequences of human actions on natural resources. Nature preservation has been characterized by the creation of national parks which had the ambition of preserving nature for the future generation, and also to create outdoor recreation and tourism (Sandell et al.2004:.43). Although both concepts are concern about human activities in relation to the natural world, they however deviate on the approaches they believe human action on the natural world can be minimized.

Conservation as illustrated is concerned about redressing the impact of human activities on the natural environment while preservation on the contrary, advocates for no human intervention. Therefore as Graham and Connelly (2003:16) pointed, the concept of conservation can be sum up as being based on the notion that “ human beings not only cause environmental destruction, but they are also able to develop and implement solutions to the destruction they cause. Human destruction of the natural environment as the authors adhered, is propelled by two factors; affluence and poverty. Environmental destruction resulting from the former was identified to be associated with issues like carbon dioxide emission resulting from the utilization of cars. Poverty was remarked to account for environmental problems such as deforestation for the construction of shelter and for fuel wood. Conservation is often a top priority in the North, while countries in the south discourse on the environment is limited to the provision of basic needs, cultural identity and strategies of survival (Redclift 1995:26).

#### ***1.4 Overview Information on Prunus africana***

The information presented here about the tree is not limited to its existence in Cameroon, but information written in other parts of African where it exist would be included. This involves

its distribution on the African continent, its characteristic features, its value to the local communities and the international market.

*Prunus africana* other wise known as pygeum africanum, African cherry, red stick, is a medium size canopy tree that is wide spread on the African continent, notably in Sub Saharan Africa. In spite of the variation in its scientific appellation, in each region in Africa where it is found, the local populations call it different names. In the mount Cameroon region the inhabitant called it “wotangu”, in other parts of Africa such as in Kenya it is called “Muiri”, in South Africa notably in the Kwazulu Natal, the Zulu community called it “Inyazangomaeliminyama”. The word *prunus* is considered to be a genus word derived from Latin, which signifies the plum family, while *africana* is given owing to its uniqueness to the African continent (Nonjinge 2006). This *prunus* specie found mostly in afro-montane regions. Its occurrence stretches from west, central to southern African countries. The countries where it is noted to be present include Cameroon, Ivory Coast, Kenya, Tanzania, South Africa, Democratic republic of Congo and the islands of Madagascar and Sao Tome. Cameroon is remarked to inhabit the largest population of the tree (Nsawir & Ingram 2007:1). It has been noted that what actually brought the tree to international recognition is its bark, believe to possess medicinal values (Page 2003:362). The tree is usually estimated to grow as tall as 30m to 40m tall. It is an evergreen hard wood tree with dark brown bark. It produces fruits that look like cherry when ripe that constitute vital source of food for birds and animals (Nsawir and Ingram 2007:1).



Figure 1. Picture showing *prunus africana* tree and leaves by E. Dayne (accessed 31/3/2008)

Before its international popularity, the tree was valued by the local communities in Cameroon and in other regions in Africa for its medicinal values. *Prunus africana* is a multipurpose tree. It has both medicinal and non-medicinal value to the local population. The wood of the tree is used for the manufacture of the handles of agricultural tools like hoes and axes. It is also utilized as fuel wood for cooking, as well as in the manufacture of furniture,

the building of bridges and in protecting water catchments (Nwasir & Ingram 2007:1). Before its discovery by Western countries, the local communities in Africa utilized the bark of the tree for the treatment of ailments (Stewart 2003:3). In Eastern and Southern African countries, it is used for the treatment of fever and stomach ailments, as well as a purgative for cattles. In South Africa, it is believed to possess magical powers and to be very effective in curing chest pain (Nonjinge 2006). In Cameroon, it is used to cure fever, chest pain, stomachaches, malaria just to name a few (Nsawir & Ingram 2007). Western countries first became aware of its existence in the eighteenth century, when some European travellers came in contact with some traditional medicine men in South Africa (Page 2003).

However, in spite of the fact that its discovery by Europeans dates as far back as the eighteenth century, it only gained international popularity in the 1960s following the issuing of its exploitation patent. This was marked, by the lodging of a pygeum bark extract patent by a French entrepreneur by the name of Dr Jacques Debate in 1966. The commercialization of the specie bark commenced in 1972, marking its exploitation for commercial purposes (Page 2003:362). This resulted to a substantial increase in its availability in the international market with western countries notably France, Italy and Spain being the major buyers. It has however been remarked that of all the three Western countries, France is the largest importer of prunus extract.

### ***Debate over plant genetics and patent rights***

*Prunus africana* is a tree that is bestowed with medicinal value, accounting for an increased in its international demand. It constitutes part of plant genetic resources. The inclusion of this section is based on the premise of providing information on the dynamics surrounding international trade in biodiversity species. Manuel Ruiz (2004) identified two phases marking the history of genetic resources. The first phase occurred prior to the creation of the convention of biodiversity (CBD). During this period, genetic resources were regarded to be “part of common heritage of mankind and perceived to belong to everybody and no one at the same time. This era was characterized by the free and unregulated flow of these resources across continents (Ruiz 2004:3). The legal requirements were not very strict since trade in them was subjected to the international trade rules (Ruiz 2004:4). However following the creation of CBD there has been greater awareness of the economic and ecological values attached to these resources. This has led to a new concern about sovereignty, property and control, characterized by the division between countries in the south that are biologically rich but technologically poor, and the countries of the north that are technologically rich but

biologically poor. This has sparked the debate over the intellectual property rights wherein the countries of the south are demanding sovereignty over their genetic resources. In addition, the issue of patent has been criticized on the basis that it helps to broaden the technological gaps between countries of the south and north (Ruiz 2004:5). Chasek et al (2006:160) point that there was a struggle between North and South countries over the issue of plant genetic resources and the intellectual property rights (IPR) during a UNEP meeting held in 1990. This was linked to the lack of consensus between delegates from both groups over the issue of ownership of genetic resources. With countries from the south opting for a complete control of genetic resources found within their border, countries from the north held contrary views. They believed that these resources constitute part of “common heritage of mankind” and thus should be made available to all without any restriction (Chasek.et al. 2006:160). On the other hand, some developing countries adhered to the notion that genetic resources belong to the countries in which they are found and therefore access to them should be based on mutual agreement between the countries. The next paragraph would provide overview information on the studied area.

### ***1.5 Background Information of Studied Area***

To better comprehend the topic under study, it is essential that brief overview information of the studied area be provided, this would portray its characteristic features. The mount Cameroon region is found in the South West province of Cameroon. It denotes the area surrounding Mount Cameroon, which is the highest peak in west and central Africa, with an estimated height of 4.095 meters above sea level. (Mount Cameroon project report 2002). The region is estimated to have a population of approximately 300.000 inhabitants with roughly 50 % found in Limbe and Buea. The main ethnic groups found in the area include the Bakweri and Bomboko (Page 2003:363). The region stretches from the slope of the mountain in Buea to the sea in Limbe. According to reports published by the mount Cameroon project (MCP), the region inhabits a substantial population of *prunus africana* in Cameroon in a whole and probably in the entire West and Central Africa (MCP: 13). It is remarked to be covered with one of the densest forest in Africa. *Prunus africana*, as the report highlighted is the third most sumptuous canopy tree specie found in the region. The region is renown for its rich volcanic soils and its diverse biodiversity. There is an abundant flora and fauna species found in the region. Many people migrated from different parts of the country and even Nigerian to the region due to its rich volcanic soils, where they have engaged in agricultural activities notably farming. Apart from engaging in farming the inhabitants also derive their

livelihood from hunting and exploitation of *prunus africana*. The inhabitants regard *prunus* to be important because it serve several purposes in their community. Apart from engaging in agricultural activities, a considerable proportion of the population are also employed in the public service as teachers, nurses etc.

### ***1.6 Outline of Structure of Paper***

This paper is sub divided in to five major sections, that is the; Introduction section, Previous studies section, theoretical framework section, analytical section and finally conclusion.

Chapter two of the paper provides information on previous studies that have been written prior to this study. This includes studies conducted in Cameroon and in other regions, as well as information on the mangrove tree encountering similar problem like *prunus africana*.

Chapter three is centered on providing a theoretical framework to the paper based on the concept of sustainable development.

Chapter Four is the analytical section of the paper. It includes data method, data analysis and also summary of the analysis

Chapter Five is the conclusion section of the paper. It embodies information on policy implication and further research sections.. With the outline of the paper provided the next paragraph looks at the concept of conservation.

## **Chapter Two**

### ***Previous Studies/Literature review***

This section of the paper is centered on providing information on what other researchers or scholars have written prior to this study. It is worthy to mention that the studies presented here, are not solely focused on *prunus africana* exploitation in the mount Cameroon region in particular and Cameroon in general, rather it includes information from other regions of Africa. Although this study is focused on *prunus* exploitation and conservation in the mount Cameroon region, it is pertinent that information on how people in other regions in Africa, have dealt with problems relating to indiscriminate biodiversity exploitation to be provided. The inclusion of these studies will help to provide a broad picture of some of the major factors responsible for the indiscriminate exploitation of biodiversity species. Discussion of the previous studies is done under four themes; resource utilization, causes, threats and remedies.

### ***Resource utilization***

The important role that the *prunus africana* tree plays in the local communities has been a major area that has lured many researchers attention. Intrigued by the medicinal value of *prunus africana*, Kristine Stewart (2003) embarked on a research on the medicinal role the tree plays in the Mount Oku region of the Northwest province of Cameroon. Her article was entitled: *The African Cherry (Prunus Africana) from hoe handle to the International Herb Market*. In this study, Stewart portrayed that before the advent of massive exportation of the tree's bark to the international market, the local population essentially cherished it for its medicinal values. Traditional healers mostly used the bark of the tree in curing malaria, fever and other ailments (Stewart 2003:3). Furthermore, her studies demonstrated that the tree was considered to be good for the manufacture of furniture, and agricultural tools notably hoe handles (Stewart 2003:5). The major goal of her studies was to assess the traditional medicinal values of the tree's bark to traditional healers in the mount Oku region of Cameroon. Nonjinge Siyabulela (2006) in the paper titled *prunus Africana (hoof) Kalkman*, pointed that in South Africa, the tree is cherished for its medicinal values, just like Stewart illustrated in her study in Cameroon. Apart from its medicinal values, it is also used as an ornamental tree in parks and large gardens. These studies actually demonstrated that the tree has varied uses to the local population, be it medicinal or cultural.

### ***Causes of Exploitation of Tree***

This is a major area that has been the focused of previous studies carried on the tree. A pertinent point raised by Stewart (2003) in her study was that the mass exploitation of the tree in the Oku region in particular and in Cameroon in general, has been triggered by the increasing demand of the tree's bark in the international market by western pharmaceutical companies. This has inherently resulted to the advent of its indiscriminate exploitation (Stewart 2003:6).

Alisha Ryu (2006), in the paper entitled *Africa's medicine tree facing extinction from Greed and corruption*, sought to examine the factors responsible for the mass exploitation of *prunus* in Kenya. Ryu portrayed that the tree named "Muiri", locally is cherished by the local population for its medicinal functions. One of the factors Ryu identified to be responsible for the overexploitation for commercial purposes was the increase in its demand by European countries. Ryu believed that the current state of the tree in Kenya has been spurred by the greed of western companies and corruption in Kenya (Ryu 2006:1). Ryu presented the

opinions of Kenyan conservationists on the situation notably that of Wangari Mathaia a Noble laureate. Wangari perceived the problem of the diminishing population of the tree in Kenya not to be the sole responsibility of western companies but also to be the fault of foresters, government ministers and government personnel who are responsible for safeguarding the country's natural resources (Ryu 2006:2). She remarked that poverty is the prime factor responsible for environmental demise.

### ***Remedies***

Suggestions on how the mass exploitation of the tree can be remedied, is also an issue that has been addressed. Ewusi Njombe (1998) in his study on the *sustainable management of prunus in the mount Cameroon region* believes that the mass exploitation of the tree has accounted for the advent of unsustainable exploitation in the region. He believes that the situation can only be remedied through the adoption of a participatory approach that involves the active participation of the local population. He cited the establishment of partnership between the local communities and businesses as a factor necessary in order to achieve sustainable harvesting of prunus. Ryu Alisha (2006) also pointed that conservationists should endeavor to sensitize the Kenyan population of the importance of protecting natural resources as a remedy to the situation. Ryu concluded with the remarked made by Wangari, that western companies and African governments should work in tandem to remedy the situation and eradicate the destructive cycle of greed and corruption (Ryu 2006:3).

With information provided on studies that had previously examined the exploitation of prunus, I will also like to include here information on another tree that is facing the same problem as *prunus africana*. The decision to include information on the mangrove tree in this study was driven by the ambition to demonstrate that the issue of indiscriminate unsustainable exploitation is not only limited to the exploitation of *prunus*, but it is also a problem prevalent with the exploitation of other trees. Just like *prunus africana*, the mangrove tree is encountering problems of unsustainable exploitation. The conservation of the mangrove tree has been remarked to be important because the tree's roots help to protect the coast from erosion and storms, it also support varied ecosystems. This has been raised as been one of the prominent reasons why it is vital to conserve the tree, with most researchers raising the importance of adopting a participatory management of the tree that would include the local population, as a means of solving the problem.

### ***Causes of exploitation***

David Mirera (2007) carried a study on the exploitation of mangrove tree in Kenya. He was concerned about the indiscriminate exploitation of the mangrove tree. He identified the major factor responsible for the outburst of mangrove exploitation along the Kenyan coast to be due to extreme poverty prevalent in the region. Mangrove harvesting as he remarked is perceived by the local population as an income-generating source. They depend on it for their subsistence.

Owing to the outburst of mangrove tree exploitation in Togo, Ebeh Adayade just like Mirera was propelled to embarked on a research on how a participatory approach of the tree's conservation can be attained. As he portrayed, the alarming harvest of the tree has accounted for a tremendous reduction in its population from 4000 hectares in 1988 to 2000 hectares in 1995 and to 800 hectares in 2004. These figures illustrate the diminishing rate of the tree in Togo, which might lead to its extinction if prudent sustainable measures are not put.

### ***Remedies***

Ebeh Adayade identified the importance of sensitizing the local population on the need of conserving the tree. He believes this would help to increase community awareness, which is vital for the prevalence of collective action required for participatory management. In order to achieve a participatory approach in mangrove conservation, the author pointed that the village community development organizations, the rural media and NGOs concern with mangrove conservation, have a major role to play to encourage the local population of the importance of conserving the tree.

In order to remedy the situation in Kenya, David Mirera illustrated that a silvofisheries project has been introduced. This was identified to constitute a project that was adopted to foster participatory management of the tree. The project seeks to promote sustainable usage and management of the mangrove environment and also encourage income generating activities notably mud crab cultivation to lure the population from exploiting the tree.

Judging from both studies provided on the indiscriminate exploitation of the mangrove tree, the problem can be linked with the situation of *prunus africana* exploitation in the mount Cameroon region. Both studies portrayed that for the problem to be redressed, there is a need for a participatory approach that is centered on the involvement of the local population in the conservation of the tree.

## Chapter Three

### *Theoretical Framework*

In order to assess the conservation of *prunus africana* in the mount Cameroon region, the concept of sustainable development constitutes the theoretical base of this study. This section looks at the main ideas and arguments raised by the concept, it also traces the origin of the concept.

#### *The Concept of Sustainable Development*

The concept of sustainable development (SD) is considered to have galvanized in the industrialized countries in the 1960s, following the recognition of the outburst of environmental problems plaguing the world. Its emergence was preceded with varied publications notably amongst which were; the population bomb (1968) written by Paul Elrich and the famous Limits to Growth (1972) written by the Club of Rome. These publications sought to lure public attention towards issues relating to global development and the environment. Rao (2000:9) remarked that during the initial stages of its introduction in the 1980s, the concept was mainly included in publications written by the International Union for the Conservation of Nature and natural resources (IUCN). This goes to demonstrate that environmental concerns constitute a pertinent place in the concept.

Apart from the varied publications that were made, the development of the concept was also marked by the organization of various conferences that sought to halt human depletion of natural resources. The most prominent of these conferences was the Human Environment Conference of 1972 that propagated for the redefinition of development approach. In 1992, a United Nations conference on Environment held in Rio de Janeiro led to the adoption of Agenda 21. The conference was convened as a means to lay down rules to govern human activities.

The concept of sustainable development (SD) has been considered to be ambiguous. Michael Redclift (1995) adhered to the point that it is difficult to define the term Sustainable Development because of its vagueness. Due to its ambiguity, numerous definitions of the term have been developed. However James Conelly and Graham Smith (2003:2) believed that even though varied definitions have been purported on the concept, the most famous is that developed by the Bruntland Report of 1987 entitled *Our common future*. It was named after the Norwegian prime minister Gro Harlem Bruntland, who was chairman of the commission (Sandell et al.2003: 50). In this report, sustainable development was defined as “development

that meets the need of the present generation without compromising the ability of the future generation to meet their own needs” (Conelly & Smith 2003: 2).

Furthermore, Michael Redclift (1995:25) stated that the concept is regarded to be ambiguous in the sense that it means different thing to different people. This thus brings in view the three dimensions that the concept is often perceived, that is economic, social and ecological sustainability. The international world conservation union of nature (IUCN) in a paper written in collaboration with WWF stated that sustainable development is development that is economically viable, socially acceptable and environmentally sound. It goes further to point that if the three elements are not integrated, development is not sustainable. It is widely believed that economic well being, social development and environmental stability must be dealt together in a bid to achieve development that is sustainable. This implies that for sustainable development to prevail, the three pillars must intersect with the activities of one not impinging on the other (Wright 2005:9). The IUCN and WWF paper stated that the weakening of one of the pillars has repercussion on the others. This means that if each of the three pillars are dealt separately from each other, without paying attention to the interactive effects between them, this might spur unanticipated effects. Amongst the three pillars, economic growth has been cited to override the other two pillars that is social development and environmental concerns. What then is economic sustainability?.

Richard Wright (2005) perceived economic sustainability as relating to growth, efficiency and the maximum utilization of resources. In the IUCN& WWF paper, economic Sustainability was discussed as relating to economic growth marked by sporadic economic changes driven by market forces and market policies. It is associated with global economic integration propelled by trade liberalization. The basis of economic sustainability is centered on the pressure to attain development and achieve economic wellbeing that is focused essentially on financial capital. This has been identified as the major factor that has triggered the advent of unsustainable exploitation of natural resources. Assessment of the economic sustainability of *prunus* exploitation will be viewed from the economic benefits that trade in the tree’s bark renders, and how this has contributed to the advent of unsustainable exploitation practices.

To Richard Wright (2005) Social sustainability is viewed by Sociologists as relating to equity, empowerment, social cohesion and cultural identity. The UK Department for international development (DFID 2002) asserts that the social dimension of the concept of sustainable development is usually neglected since development is often perceived in relation to economic growth. The DFID (2002) paper identifies the main components that constitute

the social dimension of the sustainable development concept to include social justice, solidarity, participation and security. Social justice is centered on the existence of equal opportunity and the achievement of all human rights. Solidarity deals with promoting social inclusion, cooperation and associational life. Participation is centered on the provision of opportunities that would enable everybody to play meaningful role in development. This is believed would help to ameliorate the quality of people's life. Security deals with the provision of livelihood safety from physical threats. Thus from the information provided, it can be said that social sustainability is concern about improving the life of people. Therefore based on this, the analysis of the social sustainability of *prunus* exploitation will be assessed from this angle.

Last but not the least, the ecologists on their part base their attention on issues relating to the preservation of the natural system integrity (Connelly & Smith, 2003:10). The logic behind the ecological dimension of the concept as Connelly and Smith (2003:9) point, is centered on sustainability yield, which is based on the notion that it is possible to harvest a particular quantity of trees or fishes every year without exhausting the forest or fish population under a certain number. If this harvesting capacity is maintained, the process can continue unimpeded. On the contrary, if the percentage of trees felled surpasses the potential of the remaining trees to grow and replace the felled ones, this leads to the emergence of unsustainable yield. Richard Wright pointed that the concept of sustainability at its conception was applied to human activities vis a vis forestry and fisheries (Wright 2005:9). As Wright remarked, human interaction with the natural world is often not sustainable. Sustainability is another subject that has characterized the ambiguity of the concept. Michael Redclift (1995:25) highlighted that there is a lack of consensus as to what is to be sustained since sustainability is viewed from different facets. Some authors view it from the resource dimension, while others relate it to the sustaining levels of livelihood derived from resources.

The concern of the sustainable development concept with regards to the environment is focused on natural resource management. Ghai and Vivian (1995), point that the sustainable management of natural resources at the local level is imperative for the achievement of the goal of global sustainable development. For sustainable development to be achieved, the participation of the people is vital. To Ghai and Vivian (1995:14), since local livelihood requirements increasingly necessitate the rehabilitation and conservation of the resources available to the local communities, people's ability and will to undertake such efforts at the local level is essential for the successful achievement of environmental management. Based on this point, it can be said that for successful conservation of the *prunus* tree to be attained,

participation of the local population is imperative. Chascar Twyman (2000) identified the participatory approach to be linked to natural resource management marked by the participation of the local population in the decision making and management of these resources. It thus strives for a community-based participation, by promoting a sense of awareness amongst the local communities in connection to the resources they have available in their environment. Vivian Jessica (1995:53) point that world conservation strategy cited the “lack of awareness of the benefits of conservation and of its relevance to everyday concerns, as a major problem to be overcome before sustainable development can be attained”. The issue of natural resource management emerges firstly when a society or community identifies the resources within its environment. Ghai and Vivian (1995:1) point that the management of natural resources at the local level can be attained either through external assistance such as state institution or by the local population themselves. The management of natural resources is usually reserved to NGO’s and governmental institutions. In the absence of these institutions a situation Garrett Hardin (1968) termed “Tragedy of commons” emerges. This is marked by a situation where common resources are freely utilized by individuals in a community but are managed by none, thereby causing their degradation (Kurien 1995:221). Vivian cited this scenario to be most glaring in third world countries where natural resources are community owned and are freely accessible by all. In this situation individuals in the community often indulge in the exploitation with the purpose of extracting as much of the resource, since no single individual has to pay full cost for its overexploitation because the resources are common property (Vivian 1995:59). John Kurien (1995:221) on his part explained this to arise due to the rationality of individuals. This can be linked to the exploitation of *prunus africana* in the mount Cameroon region, which is a resource that is accessible to every individual in the region.

Vivian (1995: 37) mentioned that the participatory approach to environmental management emerged due to the failure to recognize the importance of people’s participation in prominent reports like Bruntland (1987) and the world conservation document (IUCN1980). Vivian further stated that participation is not only limited to the contribution of people’s time and labour, but also includes their involvement in the formulation of decision at the local level. The absence of local population participation constitutes a major set back in solving environmental problems (Ghai & Vivian 1995). Ghai and Vivian (1995:2-3) believed that grass root participation is absolutely important in every circumstance connected with environmental degradation especially in developing countries. They uphold that the promotion of grass root participation helps in the achievement of sustainable development.

The participatory management approach is focused on organizing local communities in to village organizations (VOs), community based organization (CBO's), that identify the problems and promote social mobilization and awareness. The absence of interest on the part of the local population has been noted to threaten the success of the participatory approach which tremendously propels the emergence of inefficient management system. Vivian Jessica (1995: 53) raised the point that the concerns of the grass root people in third world countries in the South must be fully addressed before sustainable development can be attained. This implies that factors such as poverty, which has been identified to be a major factor responsible for the local population in developing countries involvement in the exploitation of their natural resources has to be dealt with before any efforts at halting environmental degradation is to be achieved. This has been considered to be a problem that has not being fully addressed by the concept since it was conceived in the North.

From the aforementioned information presented on the concept of sustainable development it can be concluded that, it strives to ensure that sustainability prevails in the utilization and management of natural resources by human beings. The information provided, demonstrated that the concept is based on two major arguments. The first argument is that for sustainable development to be fully achieved, the three pillars must work together without one adversely affecting the other. The second argument or point presented on the concept was that the successful implementation of the concept is dependent on the adoption of a participatory approach. The participation of the local communities was identified to be necessary in any sustainable management of natural resources. These two arguments constitute the theoretical parts of the concept that will be utilize in the analytical section. The analysis would seek to examine how the exploitation and conservation of the tree helps in the achievement of the objectives of the three dimensions, and also if the three pillars can be attained without one affecting the other. It would as well illustrate if sustainable management of the tree, that stands for a participatory action can be attained without affecting the objectives of the three pillars.

## **Chapter Four**

### ***Data Collection and Analysis***

#### ***4.1 Methodology***

David Silverman (2005:109) defined methodology as a general approach of studying topics. It sets the pace on how one intends to precede in studying a phenomenon. It therefore

determines which methods are used and how they are used

This paper is based on the qualitative research mainly because of the topic under study. David Silverman considers method to entail techniques that take certain meanings depending on the methodology in which they are employed (Silverman 2005:110). He identifies several methods that make up the qualitative research. They include interviews, direct observation, participant observation, ethnography and text data. This paper is based on text data, which Silverman cited to depend on in depth data analysis (2005:55). The choice of text data is due to the inability to conduct field study. Text data is obtained from varied sources, which ranged from reports, newspapers, scientific textbooks, journals. Silverman (2005:109) defines text as “ heuristic device to identify words and images which have become recorded without the intervention of a researcher”.

A major problem identified with the usage of text data is that of the reliability of the information included in the text. He explained this on the basis that text data are susceptible to be artificial because with the availability of Internet, people can construct texts (Silverman 2005:5). To counter this problem I have utilized data that are mostly published under the auspices of local and international organizations which increases the reliability of the sources. Robert Yin (1994a: 36) perceived reliability as relating to whether a later investigator can pursue the exact procedures in the same study described by an earlier investigator over again, and arrive at the same results and findings. Silverman (2005) explains reliability to be linked with the provision of information on the procedures and methods used by a researcher. In addition, Yin stated that the goal of reliability is to reduce and minimize the errors and bias in a study. However, he pointed that reliability can be attained by documenting procedures mentioned in an earlier study (2003b: 38-37). Reliability has being a problem because previous studies had been poorly documented, this he noted can be redress by maintaining a chain of evidence (Yin 2003b:109). To strengthen the reliability of this study, I have provided step-by-step information on the structure of the paper. This includes information on the problem and aim of the study, methodology and data method, data collection technique as well as the theoretical framework. I have also included references of data I used.

#### ***4.1.1 Data Collection***

This study is based on the secondary data which encompasses the utilization of books, articles, and journals gotten from the library and internet, which in all constitute text data as explained above. The materials used in this paper have either directly or indirectly dealt with the topic under study, and are written by both individuals, local and international

organizations. Due to the inability to travel to Cameroon to conduct field studies, I had to rely on secondary sources. One main consequence of using secondary source is that of the inability to acquire certain information that were not included in studies written prior to this, such as the percentage of the population in the region involved in the tree's exploitation

The empirical data that is used in the analysis of this paper was obtained from varied sources. This includes; books, journals and articles written on the issue of natural resource management. Information was also obtained from MCP website and the World Bank website. Under the discussion of the factors that led to the advent of indiscriminate exploitation, much reference will be made to a 1995 World Bank report on Cameroon derived from its website. It will also include articles written by Kristine Stewart (2003), Ben page (2003) and Cunningham and Mbenkum (1995). Articles written by Tieguhong and Ndoye on Mocap-cig activities regarding prunus exploitation will be used to provide information on the conservation measures that Mocap had taken to address the problem of unsustainable exploitation. Tieguhong and Ndoye (2006) article would also help to provide information on the benefits the harvesters and the government derived from the exploitation of the tree

Silverman identified that in qualitative research texts or documents may be analyzed for different purposes. Thus in this paper, the analysis will address many issues. The empirical data would be analyzed within the context of the SD concept. The purpose for doing this is to find out if the three facets of the concept can be attained with respect to the exploitation and conservation of prunus. To achieve this, information on prunus exploitation in the region will be collected and analyze under the three dimension of the SD concept that is ecological, social and economic. Furthermore, a descriptive analysis will be employed to analyze the factors that accounted for the development of unsustainable exploitation. This has the intension of providing an explanation as to why indiscriminate exploitation emerged in the region in the first place. Descriptive analysis is centered on finding out how things are or how they have been. In addition, the analysis will include data that provide suggestions on how the problem of unsustainable exploitation can be redressed.

### ***Basis of Data Selection***

The sources included in this study were selected on two basis; firstly on the basis of their relevance to the objective of this study, and secondly on their availability. I utilized information that was available either on the Internet during the period of this study, or in the library. It is pertinent that I point that the availability of information on the topic may not

necessary imply that they actually address issues relating to the aim or objectives of this study. Hence I included information that are not only available but have relevant information on what I wanted to assess on the exploitation and conservation of prunus

#### ***4.1.2 Data Limitation***

This study is concentrated from the period 1985 to 2000. The choice of this study period was based on the fact that the year 1985 marked the start of mass exploitation of the tree. Most of the information utilized was written within this time frame. Silverman (2005) explained data limitation to relate to the need of a researcher to have a limited body of data to use. In addition to that he asserts that it also brings in the problem of reliability of the sources, which was explained above. Another issue associated to the idea of data limitation is that of bias. Yin (1994a: 59) explained the problem of bias as relating to the degree to which the researcher is open to contrary findings. Yin (2003b) identified a couple of problems that might cause a study to be bias. This include, leaving out evidence and including only information that supports an investigators conclusion. He believes that an investigator should strive to be neutral by presenting both supporting and challenging data (Yin2003b: 164). In this study I have tried to be neutral in my analysis by presenting information regarding the exploitation of *prunus* from various angles. Although international demand for the tree's bark is widely heralded as the main factor responsible for the advent of indiscriminate exploitation of the tree, I have actually attempted to examine other causal factors at the local level that are not always mention to be responsible for the tree's exploitation. Furthermore, I like to mention that I did not encounter data that portray contradictory information connected with the tress exploitation. This has helped to reduce the bias of this study. I used information that were published by Mount Cameroon project (MCP), Mocap-cig, the world bank and articles, reports and journals published by individuals that have conducted research on the topic.

#### ***4.1.3 Limitations of Study***

One of the major issue that I think can be considered as a limitation to this study is that of the inability to provide first hand information. Due to financial constraints I was unable to conduct field studies. I think it would have been interesting if I had conducted interviews on the local population to acquire information on their views on the issue. This would have made it possible for me to acquire certain information that were not included in the previous studies I came across.

## ***4.2 Data Analysis***

This section intends to provide analytical information on the conservation of *prunus* in the Mount Cameroon area with the aid of the three dimensions of the sustainable development concept. The information provided in this section will seek to answer the main research question raised at the beginning of the paper, which is, why the exploitation of the tree is still persisting in spite of the negative repercussions this has on the tree? The answers to the main question will be provided with the aid of the sub-questions that were raised. This section is therefore divided into three sections. The first part seeks to provide information on the factors that led to the emergence of mass unsustainable harvest of *prunus*. The second section addresses the second sub-question. It will involve an analysis of the various conservation strategies that have been adopted by Mount Cameroon Project (MCP) and MOCAP-CIG. This is discussed under ecological sustainability. The third section addresses the third sub-question that is based on the benefits (economic and social) linked to *prunus* exploitation. Both benefits will be discussed under economic and social sustainability respectively. The economic benefit is viewed from the financial benefits the tree's exploitation renders to the harvesters and the government. This includes an examination of the price ranges that *prunus* bark is sold. While the social sustainability of the tree's exploitation is viewed from the facet of the social benefits that the exploitation of the tree has provided to the exploiters and their community at large. With an outline of the structure of this section, the analysis will commence by identifying the factors responsible for the outburst of unregulated harvest of *prunus*.

### ***4.2.1 What factors led to the advent of mass unsustainable exploitation of prunus Africana in the Region?***

Three major factors have been identified to be primary responsible for the indiscriminate exploitation of the tree, they are; poverty and unemployment, the issuing of extra exploitation permits, and the increase in the international demand for *prunus* bark. I will proceed by discussing each of these factors and how they have contributed to the advent of gross unsustainable exploitation of the tree in the region.

### ***4.2.2 The prevalence of poverty and unemployment in the region***

The correlation that prevails between poverty and the indiscriminate exploitation of natural resources cannot be overlooked. This is most evident in the situation of the local population involvement in the massive harvest and trade in *prunus* bark in the studied area. Ghai and Vivian (1995:12) in their assessment of grass root participation raised the point that most

people in third world countries regard environmental resources as a major source of livelihood. Poverty, population pressure and external factors have been pointed to constitute the major factors responsible for the involvement of local communities in developing countries, in unsustainable environmental practices. An examination of the indiscriminate exploitation of natural resources in most third world countries has been linked to the issue of poverty, with the case of the exploitation of *prunus* in Cameroon not being an exception. This was a similar situation in Kenya as was illustrated in the previous studies section, where the indiscriminate exploitation of *prunus africana* and the mangrove trees were identified by the authors (Ryu and Mirera) to have being triggered by the existence of poverty in the society. Wangari Maathai, a Kenyan Nobel prize laureate even stated that poverty is the prime factor responsible for environmental demise (Ryu 2006). Anthony Hall & James Midley (2004:46), in their attempt to define the word, cited that poverty has been defined variedly. They assert that quantitative studies carried on poverty, defined it as a lack of sufficient income, which is the most common dimension that the word is defined. Other approaches they discussed tend to define poverty with reference to life style, attitudes and behavior, which they cited to have been completed with studies that defined poverty with reference to income. Even though there are varied definition of poverty, the most widely known definition of the word is that propagated by international organization notably World Bank and the United Nation. These organizations defined poverty based on the one dollar per day criteria (Hall& Midley2004: 47). According to a World Bank report of 2004, 40 % of Cameroonians are still living on less than one dollar per day (Tieguhong& Ndoeye 2006:2). The main factor identified to have accounted for the increase in the poverty rate in the mount Cameroon region in particular and the entire country in general, is the economic crisis that emerged in the mid 80s. The advent of the economic crisis had a negative repercussion on the employment rates, which inherent led to an increase in the poverty level in the local communities. This consequently propelled a proportion of the inhabitants who were faced with financial constraints due to unemployment to indulge in the exploitation of *prunus*. A 1995 World Bank poverty Assessment report on Cameroon pointed that poverty is still evident in the lives of most Cameroonians, with 50 % of the rural population and 30 % of the urban population affected by poverty. It states that to be poor entails to be deprived and vulnerable, which includes to be deprived of adequate nutrition, rudimentary health care, basic education, a living income, and also to be vulnerable to diseases, hunger etc

#### ***4.2.3 How did the advent of the economic crisis led to an increase in prunus exploitation?***

Prior to 1985, which is the year that the government decided to issue extra 50 exploitation permits, and also the year that marked the beginning of mass exploitation of the tree, Cameroon had enjoyed tremendous economic boom. The economic boom was associated with the huge revenues gotten from petroleum exportation, and the increased in the export prices of agricultural products notably cocoa and coffee. According to the World Bank Poverty Assessment Report No.13167-CM of 1995, there was a sharp change or reversal in the economic performance of the country in the mid 80s. This was marked by a fall in the GDP per capita by 6.3 percent per year starting from 1985 to 1993. A drop in private consumption per capita also characterized this period. This was identified by the report as the commencement of the economic crisis that has been affecting the country. The aim of the report was to assess the factors responsible for poverty in Cameroon, its characteristics, and how it can be alleviated. The poverty assessment report further identifies the emergence of the economic crisis to be due to external factors. These factors include; the decline in agricultural export prices, a drop in the revenue gotten from petroleum exportation and finally by the huge level of foreign debt. Based on this report, these factors led to a decline in Cameroon's external trade terms. The fall in its external trade affected the economic situation of the country, which inherently posed problems to its growth. Therefore, based on the ideas of economic sustainability that advocates for the increase in market trade, the situation that was prevailing in Cameroon during the economic crisis period affected its foreign trade and hence its economic growth. With the drop in its foreign trade notably in petroleum and agricultural products, this had adverse impact on its economic growth. Since these products constitute the major income generating sources for the government. The decline in export prices also led to a loss of market for its export product, which accounted for a decline in the demand for labour. The decline in the demand for labour the report stated, led to a drop in the employment rates, which in turn triggered an increase in the unemployment rates. The poverty Assessment report (1995) raised the point that studies conducted regarding unemployment rates between 1983 and 1993, portrayed that unlike in 1983, the unemployment rates in the early 90s were highest amongst graduates. This was also marked by significant difficulty encountered by young job seekers to find jobs or better still gain entrance in to the labour market. Due to the increase in the unemployment rates in the country, this helped to spur an increase in the poverty rate in the country. With the high unemployment rates besetting the entire country, this left the local population in the Mount Cameroon area who were unemployed with no other option but to indulge in *prunus africana* exploitation. To

Tieguhong and Ndoye (2006), most *prunus* harvesters in the area, perceived the exploitation of the tree as a lucrative livelihood activity. However due to lack of sufficient data, I am unable to provide an exact figure on the total number of *prunus* harvesters found in the area. It is essential that I point that *prunus africana* exploitation is not the sole source of employment of the population in the region. A considerable proportion of the inhabitants are employed in the public service. However it constitute a source of income for people who do not have the opportunity to be employed in the public service. David Mirera pointed the same issue in his study of the indiscriminate exploitation of the mangrove tree along the Kenyan coast. He raised the point that extreme poverty forced the local population to depend on the exploitation of the tree for subsistence. Stewart (2003:6) adhered to the point that due to the high incidence of unemployment rates amongst the youths, young men perceived the exploitation and sales of the tree's bark as one of the few medium of earning money. As a result of this, the issue of illegal harvest is most tempting for them to indulge. The economic crisis that led to an increase in the unemployment rates in the country is not the only factor that accounted for the local population involvement in the harvesting of *prunus* in the region. Another factor that has been identified is the decision of the government to issue extra exploitation permits. This is discussed in greater length in the next paragraph

#### ***4.2.4 The Issuing of Exploitation permits***

The decision of the government to issue extra exploitation permits in 1985 has been identified as a major factor that set favourable grounds for the outburst of the tree's exploitation. When studies are made to identify the factors that led to the tremendous involvement of the inhabitants in the mount Cameroon area in the harvest of *prunus*, one factor that has been cited to pave the way is that of the decision of the government to issue extra exploitation permits to 50 Cameroonian businessmen in 1985 (Stewart 2003:7). It is imperative to point that prior to this year, plantecam the largest bark extraction factory in Africa and the only one in Cameroon had the only official permit to engage in *prunus* exploitation in the entire country. It held the sole monopoly over *prunus* harvest in the area. Plantecam worked in collaboration with laboratoire Debat of France, the largest bark importer (Page 2003:362). The company's exploitation license was issued in 1972, this granted it the permission to exploit *prunus* found in the region (Stewart.2003:2). During the course of its monopoly, it was remarked that Plantecam employed sustainable harvesting practices, executed by trained workers. Ben Page (2003:364) explained that its monopoly lasted from 1972 to 1985. During this period, it monitored the exploitation of *prunus*. By doing this, plantecam attempted to

implement the goals of ecological sustainability that thrives for controlled environmental practices. Its ability to regulate the harvest of *prunus* completely disappeared after 1985 following the issuing of extra exploitation permits. This resulted to a reduction in the level of regulation of exploitation. It also led to the emergence of widespread illegal harvest (Page 2003:362). It is important to point out that during the reign of its monopoly, no information of its workers practicing unsustainable harvesting was reported. However, after operating for twenty eight years the company was closed in March 2000, due to economic and political reasons. It is vital to mention that during the era of plantecam monopoly, little or no information was published as to whether the local population did engaged in unsustainable or illegal harvest and sale of *prunus* bark. It is however noted that the local population did harvest the tree's bark mainly for household usage, especially for the treatment of illnesses and the manufacture of furniture (Stewart 2003:3). No large scale harvest was reported prior to 1985. It is pertinent to add that just like plantecam held monopoly over *prunus* exploitation in Cameroon, the same scenario prevailed in Kenya, where an individual by the name of Jonathan Leakey held the monopoly over the tree's exploitation and exportation to the international market (Ryu 2006:2).

#### ***4.2.5 Outcome of the Government Decision***

Following the decision of the government to grant extra exploitation permits; the main consequence of the decision was that it led to an outburst of unsustainable harvesting practices, which did not exist before 1985. In the Mount Cameroon region, it is noted that after the issuing of the extra exploitation permits, this led to the arrival of "bark poachers" in the area (Page 2003:364). Their arrival was attributed to the depletion of the tree in the West and North West provinces. This group of exploiters comprised of illegal harvesters, who did not abide or comply with exploitation regulations that were set. They employed unscrupulous practices such as bribing of inhabitants in order to obtain permission to harvest *prunus* bark, and traveling to the villages at night to escape government forest guards (Page 2003:364). The issue of middlemen appeared. Unlike the bark poachers, this group did not actually get involved in any form of harvesting. Their role was to buy *prunus* bark from individual local harvesters, and sell them to plantecam at prices higher than which they bought them. It has been pointed out that these two groups were the major promoters of the indiscriminate harvesting of *prunus*. This resulted to mass indiscriminate debarking of *prunus* trees (Stewart 2003). Due to the outburst of indiscriminate exploitation of the tree, the government instituted a ban in February 1991 that prohibited the exploitation of the tree in any form (Cunningham et

al 1993). It has however been noted that the institution of the ban instead exacerbated the situation. It led to a substantial increase in illegal harvest and trade of *prunus africana* bark. It is remarked that during the period when the ban was adopted till when it was uplifted in 1992, the amount of bark harvested surpassed the number of bark, that has ever been harvested in the history of the tree in Cameroon (Cunningham.1993: 5). The decision of the government to uplift the ban was done based on the realization that instituting a ban on the tree's exploitation instead worsen the situation. This same situation prevailed in Kenya, where the Kenyan government just like the Cameroonian government instituted a ban on the exploitation of the tree. This however did not impede the population from indulging in the harvest of the trees bark. Alisha Ryu (2006) further raised the point that the ban was not effective. The main reason cited to be responsible for its ineffectiveness being that it was not forcefully enforced. Due to the absence of stringent measures to enforce the ban, this Ryu considered, led to the emergence of corrupt practices such as bribery of foresters by exploitation companies in a bid to obtain exploitation permits. This consequently led to the prevalence of unsustainable harvesting of *prunus* (Ryu.2006: 2). In Cameroon, the adoption of the ban by the government did not help in any form to solve the problem. It can still be connected with the fact that the failure of the ban to achieve its goal was due to the inability of the government to institute severe measures against exploiters. Thereby rendering it ineffective, and consequently leading to its uplift in 1992. The next factor which has been identified to be the major force behind the outburst of the huge harvesting of *prunus* bark is that of international demand by western countries for the tree's bark. This is discussed in the next paragraph

#### ***4.2.6 International Demand For Prunus Africana***

The advent of large scale trade in the bark of the tree would not have emerged without the increasing demand for it in the international market. The decision of the government to issue extra exploitation permits and the immense involvement of the local population in the exploitation of the tree would not have been possible without the huge demand for it. The increasing interest of western pharmaceutical companies in the bark of the tree is often regarded to be a major factor that is responsible for the indiscriminate exploitation of the tree. This emerged due to the realization that the bark of the tree is a vital component needed in the manufacture of drugs that cure diseases associated with prostate enlargement known as benign prostatic hyperplasia (BPH). BHP is a disease associated with the enlargement of prostate gland, and rampant or affects men over 50 years in western countries (Cunningham & Mbenkum 1993). This has therefore led to the increasing demand of the tree's bark by

western pharmaceutical companies. According to studies conducted on the occurrence of this disease in European and American countries, it is predicted that one out of two men in these countries, has the chance of living longer than 80 year (Cunningham et al 1993:5). The studies also portrayed that 58 % of men in these countries, have the probability of having symptoms of BPH. In the US, it is estimated that a man of 40 years has a minimum of 10 percent chances to be operated for BPH. While in Scotland, results derived from a random sample conducted demonstrated that men between 40 to 79 years experience symptoms of prostate enlargement connected with BPH (Cunningham et al 1993:5). The information that has so far being provided, goes to show that due to the high incidence of this disease amongst the male population of Western countries, this has led to an increased in its demand which is estimated to rise even further over the years (Page 2003:362). Ben Page attributes the international demand for the tree's bark to be linked to its medicinal values, which in tend has stimulated international business in the tree's bark. This is due to the fact that western pharmaceutical companies require it for the manufacture of drugs such as Tadenan, which is manufactured by Laboratoire Debat of France, Pygenil produced by Indena Spa an Italian pharmaceutical company, and Proscar by Merck and Dohme of Germany. It is predicted that there is a probability for a gross increase in the demand for *prunus africana* bark in the future by western countries owing to the fact that most of these countries are suffering from a rapidly ageing population (Cunningham et al 1993:5). Four major European pharmaceutical companies have been identified to be the main buyers of *prunus africana* barks, they are laboratories Debat of France (working in collaboration with Plantecam of Cameroon), Madaus (Germany, Spain), Prosynthese (France); Inve Beffa nad Indena Spa (Italy) (Page 2003:362). The total amount of international trade in *prunus africana* in the world market is estimated to sum up to roughly \$220 million according to reports by Washington based world Agro forestry centre and Future Harvest.

This demand of *prunus* by western pharmaceutical companies can be linked to the debate between north and south countries over genetic resources. A pertinent issue raised by the convention of Biological diversity (CBD), according to Kristin Rosendal (2006: 81) assessment of the regime, is that despite the fact that the tropical forest in the south constitutes the prime habitat for the conservation of genetic resources defined in terms of animals and plants, it is the developed countries of the north that possess technological and economic potential to derive benefits from pharmaceutical and agro-businesses. The demand for *prunus* on a global scale is estimated to have risen from 2.45million kg in 1995 to over 2.78million

kg in 1996, with the figures rising even further in 1997. Ben Page (2003:362) on his part adheres to the idea that the increase in international business in prunus has been driven by its medicinal values. It is estimated that the demand for prunus bark ranges between 3000-5000 tones per year (Stewart 2003).

The aforementioned information has identified the primary factors that have been responsible for the involvement of the inhabitants in the mass exploitation of *prunus africana* tree. The next section of this analysis would look at the conservation measures that have been adopted; this would be discussed under the issue of ecological sustainability. Economic and social sustainability would be centered on the assessing the benefits of the tree's exploitation.

### ***4.3 How has the conservation of the tree been approached?***

The respond to this second sub question is centered on assessing the attempts that had been made to address the mass unsustainable exploitation in the region. This is discussed under ecological sustainability

#### ***4.3.1 Ecological Sustainability***

Ecological sustainability is associated with the sustainable management of natural resources. Its aim is to ensure wise utilization of natural resources and promote exploitation methods that favour the prevalence of sustainable yield. Thus the conservation of natural resources falls in line with the goal of ecological sustainability. In this section of the paper, I will analyze the efforts that have been made to promote sustainable harvest, which would help to conserve the tree in the region. . It will be discussed in relation to the activities of two organizations, Mocap-cig and the Mount Cameroon project (MCP). The former is a community based organization formed by the inhabitants of nine villages in the region under the leadership of their traditional leaders (Chiefs), while the latter is a project ran by the ministry of the environment and forestry (MINEF), supported by the UK department for international development (DFID) and the German Technical cooperation Agency (GTZ). Since ecological sustainability is concerned about the sustainable management of natural resources, to examine the conservation of *prunus africana*, an assessment of the efforts or activities of both organizations is necessary. It is pertinent that I point out that no information is available regarding whether there is any form of collaboration between both organizations. However, the interest here is to present information on how the problem of indiscriminate exploitation has been approached by both organizations. An analysis of the approaches of both

organizations would encompass firstly, an identification of the unsustainable exploitation methods that were employed and a discussion of the goals and objectives of the organization regarding the conservation of the *prunus africana* tree in the region. The next paragraph identifies the various exploitation methods.

#### ***4.3.2 The Exploitation Methods***

This section aims at identifying the unsustainable harvest methods that were used by the harvesters as well as the exploitation methods that plantecam utilized. Prior to the advent of the mass exploitation, plantecam as earlier mentioned held the monopoly over *prunus* exploitation. It was remarked to employed sustainable exploitation methods executed by its workers who were trained to harvest the bark of the tree in the least damaging way. The workers were expected not to cut down the trees in order to remove the bark. They were also expected to debark up to 50 % of the tree in order to prevent girdling which might kill the tree (Page2003: 363). Finally, after debarking a tree the workers were expected to return to the same tree only after five years. These modes of harvest were remarked to be sustainable and did not have adverse impact on the survival of the trees. The institution of these exploitation practices was done with the goal of promoting sustainable exploitation of the tree, which will in tend favour, the existence of sustainable yield of the tree. No information has been published as to why plantecam adopted the sustainable exploitation methods. However it can be asserted that it opted for sustainable harvest because it wanted to exploit the tree for a longer period

#### ***4.3.3 Unsustainable exploitation methods***

The sustainable harvesting method described above employed by plantecam employees ended following the issuing of extra exploitation permits, this resulted to the emergence of varied unsustainable harvesting practices. They included; the debarking of mature and immature trees entirely, a method remarked exposed the trees and rendered them susceptible. It also included the debarking of the roots of the trees, and the felling down of the trees with the use of either chainsaws, machetes or by the setting of fire at the base of the trees (Tieguhong & Ndoye 2006). These unsustainable exploitation methods affected the sustainable yield of the tree, which Connelly & Smith (2005) explained, as been the focus of the sustainable development concept. Thus, by indulging in these practices this threaten the potential of the existing trees population to replace the exploited population, which forges the problem of unsustainable yield of the tree since the rate of exploitation exceeded the potential of the trees to grow to replace the exploited ones.

The mass exploitation of *prunus* in the area became significant or increased sporadically following depletion of its supplies in other parts of the country (Page2003: 363). In order to gain access to the trees in the forest, plantecam had to obtain permission from the local traditional rulers who were considered to represent the community and as such owners of the trees. The end of plantecam monopoly spurred widespread debarking and the destruction of trees in the forests. Money gotten from a tree that is debarked in a sustainable manner is estimated to yield roughly US \$ 10 to 20 per tree. However, unsustainable harvest that involves the felling of a tree and stripping it completely is estimated to yield as much as US\$ 200 (Tieguhong& Ndoye 2006: 2). A comparison of the two figures shows that the unsustainable exploitation method yields more money. This goes to explain why most harvesters opted for the unsustainable exploitation methods. This action of the exploiters can be associated with the idea of economic sustainability which Richard Wright (2005) pointed involves the issue of maximization of benefits. Therefore the act of the exploiters indulging in unsustainable exploitation practices can be explained by the fact that they wanted to reap maximum benefits from the harvest of the tree's bark. This can also be linked to what Vivian (1995) explained, as been the basis of Hardin's tragedy of commons concept. The ambition of the harvesters to derived short-term maximum benefit from the exploitation, affects the objective of ecological sustainability, which stands for sound environmental practices. This therefore portrays a situation wherein the attainment of one of the objectives of one of the pillars exerts a negative repercussion on another pillar. With a description of the unsustainable methods that were used by the local harvesters provided, and the sustainable methods that plantecam employed identified, the next paragraph would attempt to examine the approaches that MCP and Mocap-cig adopted to encourage the conservation of the *prunus africana* tree. This is followed by discussion of MCP

#### **4.3.4 Mount Cameroon Project Approach of Prunus Conservation**

Mount Cameroon project (MCP) is a multilateral conservation project supported by MINEF (Ministry of the Environment and Forestry). MINEF is responsible for the management of forest resources in Cameroon. MCP has as its objective that of maintaining biodiversity in the region. To achieve this objective, it works with the forestry sector, plantecam and the local inhabitants. In collaboration with its partners, MCP has adopted a Participatory Biodiversity Conservation Strategy (PBCS) for the management of biodiversity in the mount Cameroon region. The purpose of the strategy is that of maintaining through the sustainable management of biodiversity as well as ameliorating the livelihoods of the communities found in the region.

By adopting the participatory approach, MCP addresses the Social sustainability objective of participation that seeks to promote social inclusion and cooperation. By opting for this approach, it sought to involve the population. Ghai & Vivian (1995) asserts that grass root action that involves the participation of the local population in the management of natural resources is imperative for the achievement of sustainable development. What is the strategy about? The PBCS strategy seeks to set a plan of action that integrates and promotes initiatives that provide both development and conservation benefits in the long term (MCP Briefing paper.2002). The information that will be presented on MCP activities is substantially based on its promotion of sustainable management of biodiversity in general and the conservation of *prunus* in particular in the 90s. The goal of promoting the prevalence of sustainable exploitation of the tree in the region is not the sole activity of the project. It has many other issues that it addresses particularly with respect to biodiversity management in the region. Thus *prunus africana* is just one of its target project. MCP adopted the participatory conservation strategy as an approach for achieving national poverty and biodiversity conservation policy objectives (MCP 2002). MCP identifies the fact that forest resources constitute an important livelihood for the people. Therefore it believes that by promoting a participatory approach towards biodiversity conservation in general and *prunus* in particular, this would in tend help to reduce the poverty rate amongst the population. This goes to strengthen the point raised by Ghai & Vivian (1995) that there is a correlation between the indiscriminate exploitation of natural resources and the prevalence of poverty. In other words, there is a high probability for people in a region where there is high poverty rates to indulge in mass exploitation of natural resources than in areas having lower poverty margins. This has been the case in the exploitation of *prunus* in mount Cameroon region and also in *prunus* and mangrove tree exploitation in Kenya.

#### ***4.3.5 How did MCP approached the conservation of prunus?***

MCP in a bid to ensure that the conservation of the tree is achieved adopted a participatory approach. The participatory approach of natural resources as stated in the theoretical section, constitute the main medium of achieving the concept of sustainable development. To achieve this, it has opted for the establishment of a partnership between the local communities and the business interest stakeholders' (plantecam and other buyers). MCP constitute a state institution which Ghai and Vivian (1995:1) identify to be one of the means of promoting local level resource management Through this approach, a sustainable management of *prunus* would be more likely to be attained. To bring the various stakeholders together, MCP

organized a *prunus* management forum. The forum identified the hopes and vision of all the stakeholders. However, a common ground was identified by all the stakeholders, wherein the sustainable harvesting of *prunus* was recognized as paramount (Ewusi 1998).

Another measure it adopted was that of organizing training courses to educate the local population notably the young harvesters. The aim behind the organization of these training programmes was to preclude the population from indulging in unsustainable harvesting practices that are detrimental to the tree's existence. It thus convened these training courses for the villagers to educate them on sustainable exploitation method. Through this effort by MCP, the young men in the region, that were engaged in illegal harvest came together to form a union known as *prunus* harvesters union (Ewusi 1998). It is important to mention that no information is available as to whether all the harvesters were members of this union. They elected executives to run the union as well as set regulations to bind the union. Under its leadership an agreement was reached between plantecam and the union following a series of negotiation. The agreement between both parties was centered on granting the harvesters union, the permission to exploit under plantecam's license. In addition to the granting of this permission, the agreement also laid down certain conditions that had as objectives to promote sustainable harvesting (Ewusi 1998). They ranged from the identification of the amount of bark that was permitted to be harvested per month, the required method of harvesting, and finally it set out punishment for those who did not comply with the norms. It also set up a benefit sharing system. It stipulated that all the bark harvested were to be send directly to plantecam. This was done with the intension of augmenting the income the harvesters would receive. To ensure that this agreement was not breached, or was met by all the stakeholders, MCP set up a participatory monitoring and evaluation system (PME) for all the stakeholders. The goal behind the introduction of the PME system was to make sure that the agreement that had been reached was to continue to work (Ewusi 1998). By ensuring the continuation of the agreement, this was believed would substantially guarantee the sustainable management of *prunus*. To foster the activities of the harvesters union, MCP has held numerous capacity building workshops that had as objective that of raising participation and motivating members of the union. To Ewusi (1998) the participatory conservation approach is a seemingly new concept that strives for the management of biological and social issues. With a presentation of the attempts that MCP has made to ensure that sustainable exploitation of the tree prevails, which would in tend guarantee the conservation of the tree, the next section assess Mocap-cig activities.

#### ***4.3.6 MOCAP-CIG (Mount Cameroon prunus management common initiative group)***

Mocap-cig emerged in 2000 as a result of the grouping of nine villages found in the mount Cameroon area. The villages include; Bokwaogo, woteva, Bova II, Likoko membea, Mapanja, Ekonjo, upper Boando and Bakingili. These nine villages constitute members of Mocap-cig. It is important to mention that unlike MCP, which was examined above, it is not a government project but rather it is an organization that was initiated by the people themselves. Therefore the formation of Mocap-cig can be considered a community based organization (CBO), which Ghai and Vivian considered to be another means of addressing local level management of natural resources. The target here is to identify how it has approached the problem of the unsustainable harvest, its goal and objectives. Mocap-cig was created based on two objectives. Firstly it has as its goal that of controlling and managing the exploitation of prunus. Its second goal is that of managing and controlling the sales of the bark of the tree on behalf of its members.

#### ***4.3.7 Measures MOCAP-CIG has taken to solve the problem of indiscriminate exploitation of prunus***

As stated in the previous paragraph, the control of exploitation constitutes one of its goals. How has Mocap-cig strived to ensure that sustainable exploitation prevails? Before delving to identify the various approaches it has adopted, It is important to mention that it seeks to promote community based action that involves the people themselves, since it is created by the people. Ghai & Vivian (1995:2) in their study of grass root environmental action pointed that there are varied methods that the population in a community can engaged in community participation in natural resources management. One of the methods they discussed was that of outlining of rules and structure by the society, with the goal of ensuring that individuals or groups do not over exploit resources. They referred to the participation of communities at the local level, as grass root environmental action. Which they believe is vital for dealing with threatening environmental degradation. Grass root environmental action often involves practices like planting of trees. From the point raised by Ghai & Vivian (1995), the creation of Mocap-cig can be considered a community-based organization that promotes grass root environmental action at the community level. Just like the MCP, it stands for the involvement and participation of the local population in the management of *prunus*. The major concern here is to discuss how Mocap-cig as a community based organization, has adopted measures to ensure that sustainable exploitation of the tree prevails which would in turn foster or set the

pace for the conservation of the tree. Discussion of Mocap-cig activities is limited to the description of the methods of harvesting of *prunus* bark that the organization has prescribed.

Following the creation of Mocap.cig in 2000, it became along with AFRIMED, a major organization that governs prunus harvest in the region (Tieguhong et al. 2006:5). Its goals regarding the conservation of prunus is two fold. It checks upon the harvesting of prunus bark, and ensures the equitable distribution of benefits gotten from its sales. Concerning the former, harvest under the auspice of Mocap is controlled by a monitoring system that has the goal of assessing the condition of harvest and the respect of allocated quotas. Mocap has approached the issue of *prunus africana* conservation by focusing on the exploitation practices notably by promoting sustainable harvest of it in the area. It has introduced the method of strip harvest, wherein the tree is divided in to four strips. When the bark from one of the four strips is debarked, that particular part of the tree is left for a period of five years without exploitation (Tieguhong and Ndoye 2006). This is done in a bid to allow the bark of the tree that has been debarked to refill. During the five years period, any form of exploitation is done on the other parts or strip of the tree that was not debarked. With this method, Mocap believes that it is possible to harvest from a particular tree several times within a five year rotation. A harvest supervisor is assigned to ensure that the norms surrounding harvesting are respected, as well as seeing to it that all the trees harvested are tagged. The aim for adopting these norms is explained based on the notion that, with them in place, there is a higher probability of having a sustainable result in the production of mature and quality barks (Tieguhong and Ndoye 2006). This is possible only if the harvesters comply to the norms when harvesting the bark of the trees.

Another goal of the organization is that of monitoring the exploitation of forest resources in the region by cooperating with NGOs, ministerial services and other groups notable GTZ and MINFOF concern about the management of *prunus africana* and other forest related resources. Its ambition at fostering sustainable management is not only limited to monitoring, managing and adoption of harvesting norms. It also encourages harvesters particularly farmers in the area to indulge in the planting of the tree in a bid to encourage the tree's regeneration (Teiguhong & Ndoye 2006). The activities of both organizations are geared towards promoting the existence of sustainable yield of the tree. By encouraging sustainable exploitation, they are drifted towards halting the prevalence of unsustainable yield of the tree, caused by unsustainable exploitation methods. The creation of both organizations, helped to promote the sustainable management of *prunus africana* since both adopted a participatory

approach towards its management. This was explained to be imperative if the depletion of resources following the adoption of uncontrolled exploitation of natural resources is to be avoided. With discussion on the various approaches that both MCP and Mocap had laid in place to check the indiscriminate exploitation of the tree and conservation provided, the next section examines issues relating to economic sustainability, which constitute part of the third sub question. This section would examine the financial benefits derived from the tree's exploitation.

#### ***4.4 Economic Sustainability***

Richard Wright (2005:9) perceived economic sustainability as pertaining to the utilization of natural resources to obtain maximum benefits. With this in mind, an assessment of the issue of economic sustainability of the exploitation of *prunus* will be centered on assessing the financial benefits that the trade in the tree's bark has both to the individual harvesters and the government of Cameroon. Discussion of the economic aspect of *prunus* exploitation is centered on assessing the price ranges that the bark is sold in order to get a glimpse of the economic benefits reaped from its sales. It is important to mention here that most of the information that will be presented here about the prices that the harvesters get from the sales of *prunus* bark is derived under the auspices of Mocap. A look at the economic value of *prunus africana* exploitation has to the government coffers would be portrayed, this will help to explain why the government in 1985 decided to issue more exploitation permits.

The commercialization of *prunus africana* exploitation commenced in 1972, when the first exploitation licenses was granted to plantecam. An examination of the various countries that are involved in international trade in the tree's bark has revealed that Cameroon is amongst the major exporter (Ewusi 1998). Studies conducted regarding Cameroon's involvement in the trade in the 80s revealed that on an average annual basis 1.5 million kg of *prunus* bark was exported to the international market from Cameroon. In the 90s, the number is estimated to have risen to 2million kg. Attempts made by the government in the early 90s precisely in 1991 to regulate the exploitation and trade in the tree's bark led to the introduction of a ban. The ban had as purpose to preclude the exploitation of the tree. However, contrary to the ambition of the ban, it was remarked that it triggered mass illegal harvest, which worsen the situation. It is estimated that during the period that the ban was instituted, there was a tremendous increase in the number of bark exported that stood at 3.9million kg (Cunningham & Mbenkum 1993: 5). This goes to illustrate the fact that prohibiting its exploitation and trade, has not been the best solution to solve or counter the

indiscriminate exploitation of the tree. Due to the unavailability of current data, information about the percentage of trade in the tree cannot be provided.

The assessment of the prices would be done with the aid of Tieguhong and Ndoye (2006) paper on the commercialization of *prunus*. This will include information ranging from the prices that harvesters who are not members of Mocap received, and the prices that harvesters who are members of Mocap received. Following the creation of Mocap-cig, an exploiter who is a member of Mocap can earn approximately US\$ 10.8 from the sale of 32 kg of *prunus* bark per day. However, harvesters in the area who are not members of Mocap received lesser amounts which is estimated to vary between US \$ 6.4 to 9.6 US \$ from the sale of the same quantity of bark per day (Tieguhong & Ndoye 2006:2). Due to the negotiation reached by the Mocap and CEXPRO Sarl Douala ( a processing and exporting company), a major *prunus* buying company located in Douala, the economic capital, the price for the sale of *prunus* bark was set at 180 FCFA per kg (Tieguhong & Ndoye 2006:2). This price was set during a meeting held between the two parties in Buea at GTZ (German technical cooperation agency). It has been remarked that the price at which a kg of *prunus* bark is sold in the mount Cameroon region is higher when compared to the prices at which it is sold in other parts of the country. In the North West province precisely in the Oku area, the price per kg is 80 FCFA and 120 FCFA in the Manenguba region. Even though the price per kg is set at 180 FCFA, 90% of the harvester in the mount Cameroon region are of the view that it should be increased or that the prices should fluctuate between 200 FCFA and 600FCFA per kg. However, most of the harvesters considered the price to be fair and better than what they previously received for bark sales prior to the creation of Mocap (Tieguhong & Ndoye 2006:2)

An assessment of the monthly financial benefits gotten by harvesters in the area, from the sales of *prunus* bark portrayed that on an average monthly basis, each harvester obtained approximately 33.000FCFA. This was noted to vary roughly between 15.000FCFA to 52.000FCFA (Tieguhong et al 2006:3). According to reports from Mocap-cig, an assessment of individual harvester's earnings from the sales of *prunus* bark over an eight months period, was cited to vary between 120.000FCFA to 420.000 FCFA. The authors did not provide explicit information on why there was variation in the income that the harvesters received from *prunus* sales, however it can be predicted that this may have been due to seasonal demand for the tree's bark. The financial benefits of *prunus* sales as portrayed at the level of the harvesters is not limited there. It would be quite interesting to know why the government

decided to issue extra exploitation permits. Cunningham & Mbenkum (1993) in their study of the sustainable management of the tree, cited as one of the reasons behind the Cameroonian government's decision to issue extra exploitation permits, as been due to its ambition to "stimulate the industry". An examination of the economic interest of the government in the exploitation and trade in *prunus* bark cannot be undermined. The sales of *prunus* bark also generate income to the government of Cameroon. From the sales of the barks, the harvesters pay taxes to the government. It is estimated that for a kg of *prunus* bark sold, the government gets as revenue 10FCFA as part of regeneration tax. According to Tieguhong et al (2006) studies on the tax revenue paid by Mocap to the government as tax, showed that for every 100 tons of *prunus* that is harvested and sold under the auspices of Mocap, approximately 900.000FCFA as of 2005 was paid as tax to the government. This goes to show that the exploitation of *prunus africana* constitutes a revenue generating activity not only for the harvesters involved, but also for the government. The taxes paid by the harvesters to the government as regeneration taxes, helps to increase the tax revenue of the government. This can also be cited as been part of the reason why the government decided in 1985, when the country was encountering economic difficulties, to issue addition exploitation licenses. As the information has demonstrated, the economic benefits of the trade in the tree's constitute a major source of revenue for both the harvesters and government. By paying taxes to government this helps to increase the revenue of the government, which in tends increases, the economic growth of the country, which is one of the goals of the economic sustainability pillar. The economic benefits derived from the tree's exploitation and trade as portrayed above, has led to further increase in its trade which inherently affects the potential of achieving the objectives of the other pillars notably the ecological pillar. With an assessment of the financial benefits derived from the harvest and trade in *prunus* by both the harvesters and the government, the next section of the paper attempt to discuss issues associated with social sustainability.

#### **4.5 Social sustainability**

Richard Wright (2005) described Social sustainability as relating to the promotion of social equality, cohesion and cultural identity. An assessment of the social sustainability dimension of *prunus africana* exploitation will be done in connection to the social benefits associated with its exploitation, as well as the traditional significance of the tree. As mentioned in the earlier sections of the paper, *prunus africana* is a tree that has traditional importance to the population in the various regions that it is found. It is used by the local population not only for

the treatment of ailments but also for the manufacture of furniture. Analysis of the social benefits of *prunus* is viewed from two levels; the individual level and the community level. The goal behind this section is to provide information on some of the changes that the exploitation of the tree has imparted on the lives of the harvesters in the region. Tieguhong & Ndoye (2006) in their study of harvest and trade of *prunus africana* in the mount Cameroon pointed out that the sales of prunus bark constituted a major source of revenue. The revenue the harvesters get is used to ameliorate the standard of living of the population. I will rely on the statistical data that Tieguhong & Ndoye obtained with the aid of Mocap-cig.

#### **4.5.1 At The Individual Level**

The income the harvesters get from the exploitation and sales of prunus is spent on the provision of varied social amenities. The table illustrates the various amenities that the harvesters utilize the revenue from prunus harvest on. It also portrays the percentage of harvester's income that is distributed on the provision of social facilities to improve their livelihood.

Type of facility	Percentage of Harvesters spending their Income on the different facilities
School	71
House construction/Toilet	51
Buying of radio/Tv	41
Purchase of food/Drink/medicine	40
Buying of clothes	8
Family care	3

**Table.1. Table showing the social facilities and the percentage of the harvesters' income spent on the provision of each of the facilities.** Source (Tieguhong and Ndoye 2006)

The above table illustrates information derived from a survey conducted by Tieguhong and Ndoye (2006) on harvesters who were members of Mocap-cig. The authors did not actually provide in depth information on the methods used in conducting the survey. It can be asserted that the percentages obtained in the survey were calculated based on the number of times the harvesters indicated that they spent their money on the provision of a particular facility. Thus the harvesters select not just one but several facilities. As seen from the data in the table, revenue gotten from the sales of prunus bark has considerably assisted the harvesters to augment their social conditions. This has in tend helped to alleviate the poverty rate in the area. From the survey information obtained by Tieguhong and Ndoye from Mocap, the

harvesters identify more than one facility on which they spend the money they get from the sales of *prunus*. According to their studies, 71 % of the harvesters spend their prunus income to send their children to school, 51 % utilized their income for the construction of a house/toilet, 40 % for the purchase of food/drink/medicine, 41 % of the harvesters used their income to buy a radio/TV, 8 % for the purchase of clothes/shoes, while 3 % for marriage and family care. As seen from the table, a considerable proportion of the income that the harvesters get is directed towards the education of their children. By utilizing the income derived from *prunus* sales to send their children to school, this goes to show that the exploitation and trade in *prunus* helps in achieving the second millennium development goals (MDGs). The second goal of the MDGs addresses the issue of the provision of universal primary education for all by 2015. The millennium development goals (MDGs) were adopted by the United Nations as a means to improve living conditions of people worldwide by promoting sustainable development and the eradication of poverty. It was adopted following a United Nations Millennium assembly that began on the 6 of September 2000. World leaders met at the Millennium Assembly to set plans and strategies to achieve peace, security as well to eradicate poverty and promote sustainable development that favours environmental sustainability in the world in the twenty-first century (Chasek 2006:265). The MDGs were included in report titled *Road Map Towards the Implementation of UN Millennium Declaration* (UN document 56/326) written by the secretary general, Koffi Annan. It included eight development goals as well as the eighteen targets with forty-eight indicators, which are referred to as the Millennium Development Goals. Thus it can be said that with the inhabitants in the area allocating a huge proportion of their prunus income towards education, this has enabled most children in the area to attend and complete at least primary education. This has consequently helped to reduce the illiteracy rate in the local communities. This hence deals with one of the objective of the social sustainability pillar that is centered on the promotion of social justice that is base on the provision of equal opportunities for all and the achievement of all human rights (UK DFID 2002 report).

Another important issue that crops up when a closer examination of the social benefits connected with *prunus* exploitation is made, is that it helps to reduce the number of people suffering from hunger in the region. This is another area where the exploitation of *prunus africana* contributes to the achievement of MDGs. It helps to reduce the number of people suffering from hunger. Which is the target of the first goal of the MDG, which has two objectives. Which are; reducing by half the number of people suffering from hunger by 2015, and reducing by half the proportion of people living on less than a dollar a day (Chasek et al

2007). As the data illustrated, 40 % of the harvesters reserve their prunus income for the purchase of food. Thus with the harvesters allocating their income for the provision of food, this helps to reduce the number of people suffering from hunger. Due to poor sanitation, 51 % of the harvesters set aside their income for the improvement of their sanitary conditions notably with the construction of toilets. A study conducted on the lack of sufficient sanitary conditions in the entire country, has illustrated that 33 % of the rural population have access to better sanitation while only 41 % of the population have access to potable drinking water (Tieguhong & Ndoye 2006:3). Thus because of this, *prunus* harvesters in the area reported that they used their income in augmenting their sanitary condition

As the data of the survey portrayed, the exploitation of prunus to individual harvesters has considerably helped in improving their living conditions. They have utilized the revenue obtained from prunus sales in providing themselves with social amenities, which they lacked. This has helped to reduce the poverty rate in the area and consequently decrease the social gap. Most harvesters are now able to send their children to school, build houses, and improve their sanitary conditions, which they could not do prior to their involvement in the tree's exploitation. This goes to show that the harvesters' continuous exploitation of the tree can be associated with their ambition to achieve these benefits. The information provided has demonstrated that prunus harvest has helped the population in the area to meet up with some of the MDGs, which were set to be attained by the year 2015. With information provided on the social benefits that the harvest of *prunus* has on the individual harvesters level, the next paragraph looks at the social benefits at the community level.

#### ***4.5.2 Social Benefits at the community level***

The benefits of *prunus africana* exploitation is not only limited to the individual harvesters. An assessment of the social benefits of *prunus* exploitation at the community level will be centered at assessing how, the revenues derived from its exploitation has helped to forge the development of the communities or villages found in the area. The information that will be presented here is based on Tieguhong & Ndoye data obtained from Mocap-cig. Mocap-cig being a community based organization created by nine villages as mentioned earlier has as one of its goals that of ensuring the equitable distribution of the benefits gotten from the sales of the bark of the tree amongst the nine villages. Mocap-cig set up a benefit-sharing scheme that has the objective of distributing prunus revenue amongst the member villages. Out of the total revenue derived from the bark sales, 15.4 % is set aside for the village development fund, 69.2% is reserved or given to individual harvesters, while to foster the management and

monitoring of Mocap activities, 11.55 % of the benefits is reserved for that. While 3.85 % is paid as tax to the government.

The main concern in this section is to examine the 15.4 % of the revenue that is reserved for the village development fund for development purposes. Which Tieguhong & Ndoye (2006) identified to encompass the community share of the revenue. The 15.4 % of the revenue that constitute the village development fund is further divided. With 90 % of the revenue distributed equitably amongst the member villages for the finance of their various development projects. The remaining is divided amongst the traditional rulers (chiefs) of the nine villages. It is important to mention here that following the creation of Mocap, the first revenue that was placed in the benefit-sharing scheme, set aside approximately 33,000 FCFA for the traditional rulers, while 400,000 FCFA was allocated for the development projects of each of the nine villages. The funds that are reserved for the community development projects are utilized in the execution of varied development projects in each of the member villages. This has been remarked to promote solidarity in the community, which is one of the objectives of the social sustainability pillar. With the prevalence of solidarity this therefore forges the existence of cooperation in the communities. Each village decides upon the execution of a development project that the inhabitants deem is of priority to them. According to reports obtained by Tieguhong (2006:2) from Mocap, the villages executed varied development projects. Out of the revenue distributed to the villages from the village development fund, 56 % is used for the construction of community hall. The inhabitants adhered to the point that the choice for the construction of a community hall is important over construction of a school or hospital, mainly because they require a place to congregate to discuss the development projects of their community. Tieguhong & Ndoye (2006) explained that out of the nine villages, five of them cited the construction of a community hall as of utmost importance to their communities. Three of the nine villages identified the provision of portable water as their major priority. This choice was explained to be due to the fact that a substantial proportion of the population did not have access to portable water. The villagers believe that water plays a vital role in human existence. They also believed that without water in the villages, they are rendered susceptible to illnesses since they are unable to wash their clothes and are also required to travel long distances to fetch water. The provision of portable water is a prominent development project not only in the mount Cameroon region but in the entire country, with only 41 % of the rural population of Cameroon having access to potable water (WHO/UNICEF 2004) (Tieguhong & Ndoye.2006) They considered water to fulfill

several purposes ranging from drinking, cooking and bathing. 33% of the villages' income is spent on the provision of potable water. 11 % for the provision of electricity, 11% on the building of health center, 11 % on the construction of a school and 11% on the building of a market. It is pertinent to point that each of the villages identified more than one project that they intend to use the money they received from the development fund. According to Tieguhong& Ndoye study, development projects that involve the provision of electricity and the construction of market are considered to be prominent evidence of the development of a community.

#### ***4.6 Summary of Analysis***

The aforementioned analysis of the exploitation and conservation presented, an in depth information of the reasons why the exploitation of the tree is still taking place was provided. The first issue that was assessed was that of the causal factors that have been identified to be responsible for the advent of mass harvest of the tree. Three major factors were discussed. The first factor discussed was poverty and unemployment that emerged due to the economic crisis in 1980s. The emergence of the economic crisis led to an increase in the unemployment poverty rate amongst the population. The second factor discussed was the issuing of 50 exploitation permits by the Cameroonian government to some Cameroonian businessmen in 1985. The adoption of this decision, marked the commencement of large scale uncontrolled unsustainable exploitation practices, and the termination of controlled harvest employed by plantecam. The last factor discussed was that of the international demand for the tree's bark by western pharmaceutical companies for the manufacture of drugs to cure diseases notably BPH.

The next issue that was examined was the measures taken to ensure that sustainable exploitation of the tree prevails. This was examined under the theme ecological sustainability. Under it, an identification of the unsustainable practices employed by the harvesters was discussed. The various measures that MCP and Mocap-cig had taken to ensure that sustainable harvest is put in to practice were presented. This illustrated the efforts made by both organizations to encourage the local harvesters to engage in sustainable management of the tree, which would help in conserving the tree, and improve their livelihood.

The benefits associated with the exploitation of prunus were viewed from two facets, firstly with respect to financial benefits of *prunus* exploitation to both the harvesters and the government. This was assessed under the issue of economic sustainability. This portrayed the

prices that the harvesters got from the sale of *prunus* barks. It also demonstrated that the government did receive financial benefits from *prunus* exploitation in the form of tax paid by the harvesters. This can be attributed as being part of the reason why it decided to issue more exploitation permits in 1985, hypothetically speaking because much has not been written regarding why the decision was taken. The information portrays that the need to reap maximum benefits goes against the objective of the ecological sustainability dimension

Still in connection to the issue of the benefits but this time with an emphasis on the social benefits the analysis portrayed that *prunus africana* exploitation has helped to ameliorate the living condition of the population in the area both at the individual as well as community levels. This was examined under the theme of social sustainability. This illustrated the varied ways that the revenue derived from *prunus* sales has contributed to poverty reduction amongst the population. This actually demonstrated that the attainment of the objectives of social sustainability affects the ambition of achieving ecological sustainability of the tree.

## **Chapter Five**

### ***Conclusion***

The issue of the indiscriminate exploitation and conservation of *prunus* has been examined in this paper. From the information that was presented, the exploitation of the tree has little chances of ending due to the fact that it constitutes a major source of income to the harvesters in the region. With the increase in unemployment and poverty rates affecting a considerable proportion of the population in the region, the harvesters perceive *prunus africana* harvest as a vital means of augmenting their livelihood. Three major factors were identified to have actually spurred the exploitation of the tree for commercial purposes. When a closer look is made at the benefits that the harvesters derived from the tree's exploitation, this goes to show that environmental protection is not really a paramount issue for the harvesters. The need to provide basic needs such as food, shelter as shown in the discussion under social sustainability, goes to prove that the harvesters would not halt their exploitation of the tree if they are not provided with alternative jobs that would help to improve their living conditions. This can be linked to the issue of the SD concept not adequately addressing the concerns of local population of developing countries. Vivian Jessica (1995:53) adhered to point that since sustainable development concept was conceived in the north it has not made adequate

provisions on addressing problems, notably poverty that propel local population in the South to engage in unsustainable exploitation of natural resources. Michael Redclift (1995:26-28) also believes that the concept advocates for the conservation of natural resources which is possible to attain in the North due to the fact that few people livelihood are not endangered by conservation measures. On the contrary in the south the environment is perceived as a means of subsistence and this often impede any extensive efforts at improving the environment. Although efforts have been made by MCP and MOCAP to redress the unsustainable harvest of the tree, this has to a certain extent assisted the harvesters in the region to be aware of their unsustainable exploitation practices and to replace them with sustainable practices, which would foster the conservation of the tree. However, this has not led to or prevented them from exploiting the tree. By engaging in sustainable exploitation practices this would provide the harvesters with the opportunity of reaping long-term profits from the tree. Thus this paper has attempted to answer the question why the exploitation of the tree is still taking place in spite of the adverse impact this has on the tree existence. The information provided under each of the three dimensions of sustainable development, has portrayed that it is really hard to achieve ecological, social and economic sustainability simultaneously without one of the dimension affecting the effectiveness of the other. This it is evident when it comes to the exploitation of the tree in the mount Cameroon region. As illustrated, the social and economic gains associated with the exploitation of the tree are more paramount to the harvesters than the issue of conserving the tree. It can be included here that without the huge international demand for the tree's bark, commercial exploitation of the tree would not have emerged. The inhabitants would have continued to exploit the tree not on a large scale but in small scales for household purposes, which would have had little, or no adverse impact on the tree.

### ***5.1 Policy Implication***

As the analysis has portrayed the problem of indiscriminate exploitation can not be solved by prohibiting the exploitation of the tree. This section would provide some information on some recommended policies that the government can adopt to address the problem. As was demonstrated the exploitation of *prunus* is mostly embarked by the youths who are unemployed and are searching for a source of living. Due to the high unemployment rates amongst the youths, this has a substantial role to play in propelling their involvement in the harvest of the tree. Therefore the government can address this problem by creating more job opportunities around the region in order to deter the young men in the area from indulging in

the exploitation of the tree. This would help to reduce the number of people involved in the tree's exploitation, which would inherently reduce the number of trees exploited.

To ensure that sustainable management prevails in the region, the authorities of the Ministry of Environment and forestry should, through sensitization campaigns over the radio to educate the population on the importance of conserving their natural resources and engaging in sustainable exploitation practices, as well as encourage the local communities to indulge in more sustainable management initiatives like Mocap-cig as well as encouraging them to plant the trees in large scale on their farms or compounds. This would enable the harvesters to reap long-term benefits from the exploitation of the tree.

The government also needs to adopt severe punishment for harvesters caught with *prunus* bark without exploitation permits. The forestry authorities should be more focus on putting in place more checks in the forests where the trees are found. They should also scrutinize and monitor the activities of the individuals having legal exploitation permits to ensure that they respect their required exploitation quotas, as well as encouraged them to educate their workers on sustainable exploitation methods. Punishments or sanctions should be reserved for any of the businessmen whose workers are suspected of employing unsustainable exploitation methods and failing to comply to the terms of their permits.

## **5.2 Further Research**

This study has demonstrated that for a successful sustainable conservation of the tree to be achieved, there has to be a participatory management that would involve the local communities. Even though the activities of MCP and Mocap were presented as organizations that have attempted to address the issue, the point was raised regarding the absence of little or no information on whether both groups have actually collaborated. I think this would serve as a good area for embarking on future research. Another issue is that of researching on the challenges both organizations have actually encountered towards achieving the goal of promoting participatory management of the resource. This paper can also serve as a base for a comparative study of *prunus* exploitation and another natural resources encountering similar problems, in order to find out if there are any similarities or differences in their causal factors.

## Reference

- Andersson, Alison (1997) *Media, culture and the environment*. London Routledge
- Chasek, Pamela, Downie, David, Brown, Janet eds (2006) *Global Environmental Politics*. Colorado: fourth Edition westview
- Connelly, James & Smith, Graham eds (2003) *Politics and the Environment; From theory to practice*. Second Edition London Routledge
- Cunningham & Mbenkum (1993) *Sustainability of Harvesting prunus Africana bark in Cameroon: A Medicinal plant in International Trade*. Paris United Nations Educational, scientific and cultural organization (UNESCO).
- Dayne, E (<http://www.ics.trieste.it/MedicinalPlant/MedicinalPlant.aspx?id=111>) 31/3/2008
- DFID (2002) Background Briefing. Socially sustainable Development: concepts and Uses. [www.dfid.gov.uk](http://www.dfid.gov.uk)
- Ewusi, Njombe (1998) *The sustainable management of prunus in the Mount Cameroon Region*. <http://srdis.ciesin.org/cases/cameroon-001.html> 29/06/2007
- Ghai, Dahram & Vivian, Jessica (1995) *Grassroots Environmental Action: people's participation in Sustainable development*. New York: Routledge
- Hall, Anthony & Midley, James (2004) *Social Policy for Development*. Sage Publications
- Igoe, John (2004) *Conservation and globalization; A Study of National parks and indigenous communities from East Africa to South Dakota*. Wadsworth/Thomson library.
- IUCN & WWF (undated) sustainable development, poverty and the environment: A Challenge to the Global community
- Kurien, John (1995) Raising the commons and Responses of the commoners; Coastal overfishing and fishworkers' Action in Kerala state, India
- Lanchbery, John (2006) The convention on international Trade in Endangered Species of wild Fauna and Flora (CITES): Responding to Calls For Action from Other Nature Conservation Regimes in Institutional Interaction in global environmental Governance Edited by Oberthur & Gehring (2006)
- Mirera, David (2007) Enhancing Mangrove Wetland conservation through Silverfisheries opportunities in two coastal communities in Kenya [www.rufford.org/rsg/projects/david\\_mirera](http://www.rufford.org/rsg/projects/david_mirera) 11/06/2007
- McNair, Brian (2003) *An Introduction To Political Communication*. London Routledge
- Meffe, Gray K et al (2002) *Ecosystem Management; Adaptive, community Based conservation*. Island press.
- Mount Cameroon Project Policy (MCP) Briefing Note 4 (February 2002) A Participatory Biodiversity conservation Strategy for Achieving national poverty and biodiversity conservation policy objectives.
- Mount Cameroon project (undated) MCP Achievements: Participatory biodiversity conservation strategy. [www.mcbcclimbe.org/](http://www.mcbcclimbe.org/) 04/04/2007
- Nonjinge, Siyabule (2006) Prunus Africana (Hoof. f Kalkman) Kwazulu- Natal National botanica Garden. [www.plantzafrica.com/plantnop/prunusafri.htm](http://www.plantzafrica.com/plantnop/prunusafri.htm) June 29 2007
- Nsawir, Amos T, Ingram, Verina (2007) *Prunus Africana: Money growing on trees? A plant that can boost Rural economies in Cameroon highland*. FAO Nature & Faunal Journal issue 22. The value of Biodiversity
- Oberthur, Sebastian & Gehring (2006) *Institutional interaction in Global environmental governance: synergy and conflict among international and EU policies*. Cambridge
- Page, Ben (2003) *The political Economy of prunus Africana in Cameroon*. Revised Version. Department of Geography University College of London.
- Positive Outcome website (undated) prunus africana exploitation or conservation. [www.softlink.co.ke/positive/Data/archives/Africana.htm](http://www.softlink.co.ke/positive/Data/archives/Africana.htm)
- Rao, P K (2000) *Sustainable Development (Economic Policy)*. Oxford Blackwell publications.
- Redclift, Michael (1995) *Sustainable development and popular participation; A framework for Analysis in Grassroot Environmental Action* (people's participation in sustainable Development). 23-51
- Rosendal, Kristin G (2006) The Convention on biological Diversity: Tensions with the WTO TRIPS Agreement over Access to Genetic Resources and the Sharing of Benefits. In Oberthur and Gehring (eds) *Institutional Interaction in global environmental Governance*
- Ruiz, Manuel (2004) Access To Genetic resources, intellectual Property rights and biodiversity process. [www.iucn.org](http://www.iucn.org) 07/03/2008
- Ryu, Alisha (2006) Africa's Medicine Tree Facing Extinction From Greed, corruption. Website VOA [www.Voanews.com/English/archives/2006-05/2006-05-22-voa24.cfm?CFID=94](http://www.Voanews.com/English/archives/2006-05/2006-05-22-voa24.cfm?CFID=94)
- Sandell, Klas, Johan, Öhman & Leif, Östrom (2003) *Education for sustainable Development; Nature, School and Democracy*. Studentlitteratur.

Stewart, Krinstin(2003) *The African cherry(prunus Africana): From hoe handles to the international Herb market*. Bio-One online journal. [www.bione.org/perlser/?request=get-document&doi=10.1663%2F0013-0001](http://www.bione.org/perlser/?request=get-document&doi=10.1663%2F0013-0001) ... 01/06/ 2007

Silverman, David(2005) *Doing Qualitative Research* London 2<sup>nd</sup> Edition. Sage publication

Tieguhong, Julius & Ndoye, Ousseynow(2006)*Commercialization of prunus Africana(African cherry) impact on poverty alleviation in Cameroon*. Center for international forestry Research(CIFOR)

Teiguhong, Chupezi , Ndoye, ousseynous & Mambo, Okenye( undated) prunus Africana harvest on mount Cameroon and the Millennium Development goals. European News 47/48. Forests and the Millennium Development Goals. Access 2007-06-29) . [www.atfrm.org/ETFR/newsletter/news4748/n/47\\_oip\\_11.htm](http://www.atfrm.org/ETFR/newsletter/news4748/n/47_oip_11.htm) june 29 2007

Twyman, Chasca(2000)*Participatory Conservation? Community based natural resource management in Botswana*. Sheffield The Geographical journal vol 166 No. 4 p323-335

Vivian, Jessica(1995) *Foundation for Sustainable Development: participation, empowerment and local resource management*. 50-77

Wright, Richard(2005) *Environmental Science; Towards a sustainable Future* 9<sup>th</sup> Edition. International Edition. Pearson Education international.

World Bank . *Cameroon, Diversity, Growth and poverty Reduction*(1995); Population and Human Resources division . Report No.13167\_CM.  
[http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000009265\\_3961219120857&searchMenuPK=64187283&theSitePK=523679](http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000009265_3961219120857&searchMenuPK=64187283&theSitePK=523679)

Yin, Robert(1994) *Case study Research and Method* 2<sup>nd</sup> Edition. California Sage Publication.

Yin, Robert ,(2004) *Case study Research (Design and Methods)* 3<sup>rd</sup> Edition California Sage Publication

