

CRANFIELD UNIVERSITY

JASPER EZENWAKA

RURAL COMMUNITY PARTICIPATION
IN SUSTAINABLE MANAGEMENT
OF THE NIGER DELTA FORESTS, NIGERIA

SCHOOL OF WATER, ENERGY AND ENVIRONMENT

PhD

Academic Year: 2017-2018

Supervisors: DR. ANIL GRAVES & DR. PAUL BURGESS

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PhD

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ABSTRACT

The Niger Delta region has been well-known for its crude oil, which provides over 80% of Nigeria's annual income and since the 1990s, it has been known for armed conflicts and hostilities. The region is generally under-developed and the environment is being degraded as people try to secure their livelihoods. This thesis aims to identify the ecosystem benefits derived from the Niger Delta environment by local communities; appraise the methods of forest management and their effectiveness to provide a steady flow of the ecosystem benefits; identify stakeholders in the use and management of forest ecosystems, and suggest methods of collaborative forest resources management. The research adopted deductive and inductive social research methods to obtain primary data and was guided by three frameworks: livelihoods, ecosystems services, and the stakeholder participation and analysis. The result showed that the rural dwellers of the Niger Delta depend almost entirely on ecosystem benefits for their survival; they have no access to crude oil but can access forest goods and services. The urban dwellers were aware of the range of provisioning, regulatory, cultural, and supporting services but rural dwellers were mainly only aware of provisioning services. The forest stakeholders were identified to comprise rural dwellers, local NGOs, academic and research institutions (classified as *subjects*); international agencies such as the UN (classified as *key players*); wood-based industries and urban dwellers (classified as *crowd*); and the government and oil exploration companies (classified as *context setters*). The existing forest management approaches included effective community traditional approaches (where they exist) and government laws and policies establishing forest reserves, which were mainly found to be ineffective. At present, the main forest management approach is top-down and initiated by government. The full cohorts of stakeholders are not working together to ensure the effective management of these resources. This thesis recommends a collaborative forest management approach, which involves identified key stakeholders.

Keywords:

Ecosystem services, livelihoods, stakeholder participation, policy, forest conservation

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LIST OF ABBREVIATIONS

CDB	Cluster Development Board
CF	Community facilitator
CSO	Civil Society Organisation
CTs	Community trusts
ES	Ecosystem service
GMoU	Global Memorandum of Understanding
LENF	Living Earth Nigeria Foundation
LGA	Local government area
LGC	Local government council
MEA / MA	Millennium Ecosystem Assessment
NCF	Nigeria Conservation Foundation
ND	Niger Delta
NDDC	Niger Delta Development Commission
NGO	Non-governmental organisation
NPC	Nigeria Population Commission
NTFP	Non timber forest products
SLF	Sustainable livelihoods framework
SPDC	Shell Petroleum Development Company of Nigeria
UN	United Nations

1 INTRODUCTION

1.1 Background

The law that established the Niger Delta Development Commission (NDDC) defined the Niger Delta as a region, which includes nine Nigerian States: Ondo, Edo, Delta, Bayelsa, Rivers, Imo, Abia, Akwa-Ibom and Cross River States (NDDC, 2000). According to the 1991 census, the Niger Delta (as defined above) is home to about 20 million people (NPC, 1991), equivalent to about 20% of the population of Nigeria.

Most of the local inhabitants are fisher-folk and farmers (Allison-Oguru, 2006). They fish in the creeks, rivers, and the open seas. Non-timber forest products (NTFP), such as rattans, medicinal plants, snails, leaves, wildlife, fibre, fruit, gum, and honey are a source of income to the people (LENF, 1998). The livelihood of these people is intricately tied to the ecosystem services provided by the environment (Ezenwaka, 2002; Ezenwaka and Abere, 2009).

The Niger Delta region is endowed with abundant natural resources, both renewable and non-renewable; oil and gas from the region accounts for about 95% of Nigeria's export earnings and about 80% of the total annual income (Darah, 2001), but over the years it has also become a cause of many conflicts in the region (Egwemi, 2010; Kalama, 2012b; Kalama, 2012a). The region is also rich in timber and non-timber forest resources, which although of less financial worth than the oil and gas, are important to the livelihoods of local stakeholders for many generations (Abere and Jasper, 2011; Axel and Ezenwaka, 2004). These resources have beneficial market and non-market impacts such as providing a source of income, fuel-wood, medicine, food, leaves, and raw materials (Obot, 2006; Allison-Oguru, 2006).

However, many factors including unsustainable harvesting of the forest resources and crude oil exploration activities threaten the sustainability of this source of people's survival (LENF, 1998; NDES, 1997). The Millennium Ecosystem Assessment (MA) (MA, 2005) stated that globally, ecosystems are under increasing pressure as a result of human activities, it stated further "nearly two thirds of the services provided by nature to humankind are found to be in decline worldwide". Adekunle *et al* (2011) confirm this

to be very pronounced especially in developing countries like in Africa. In Nigeria, and more specifically in the state of Bayelsa, scientific approaches to conservation and preservation of the remaining forests have been proposed (including Government's effort to legislate for setting aside reservation areas) but these are not yielding the anticipated benefits for forest resources as illegal and unsustainable hunting and harvesting of the forest resources is still occurring (LENF, 1998; Amoru, 2000; Onojeghuo & Blackburn, 2011). A lack of statistics on the change in forest resources in the region is an added challenge as no meaningful planning can be done without baseline data; for instance, people are aware that forest resources are being depleted but no one has been able to give a verifiable rate of loss of forest cover for the region (Ikemeh, 2014).

There appears to be a high preference for current consumption of forest resources, so that future benefit flows are highly discounted (Adekunle *et al*, 2011) and the idea of conventional forest resources conservation is "alien" (Mmom and Arokoyu, 2010) to local inhabitants. If this continues, it will create in the long term, great problems to human and the cost implication may exceed the benefit derived in the immediate time (Loreau *et al*, 2001). Hence in many part of the Niger Delta, people's demand for forest products is exceeding the capacity of forest resources to regenerate, with the result that many of the stocks producing those resources are in decline. In addition, this decline is associated with other environmental problems such as flooding, siltation, erosion, infertile agricultural land, and decline in water resources (Adekunle *et al*, 2011).

Mmom and Arokoyu (2010) and Ezealor (2006) have argued that a major reason for the lack of success in the Government's policy in conserving forest resources is that it has not taken account of the interests of relevant stakeholders, and this may have contributed to the number of conflicts of interests in the Niger Delta. They and other authors argue that management of the Niger Delta forests needs to include all the key stakeholders to ensure that efficient and effective development options which provide the greatest degree of social welfare are adopted (Jasper and Abere, 2010; Graves *et al.*, 2009; Ezealor, 2006; MA, 2005; Bromley, 1991; Baltzer, 1998; Adger and Luttrell, 2000).

Grimble and Wellard (1997) have defined the term ‘stakeholders’ as “any group of people, organised or unorganised, who share a common interest or stake in a particular issue or system; they can be at any level or position in society, from global, national and regional concerns down to the level of household or intra-household, and be groups of any size or aggregation”. Graves *et al* (2009) described stakeholders as “individuals, groups or organisations with an interest in, and who derive potential benefit or loss from a change in ecosystem services”.

Grimble and Wellard (1997) suggest that legitimate stakeholders, particularly local communities and indigenous people who are often neglected in forest resources management planning, should be encouraged to participate in planning and in the joint management of sites as this can ensure sustainability. Ezealor (2006) affirms “any natural resource conservation effort that does not carry along all stakeholders is doomed to fail”. However there may be a need for balance as the MA (2005) said, “the problems of ecosystem management have been exacerbated by both overly centralized and overly decentralized decision-making”. Furthermore, the MA (2005) argues “that laws, policies, institutions, and markets that have been shaped through public participation in decision-making are more likely to be effective and perceived as just” and that “stakeholder participation also contributes to the decision-making process because it allows a better understanding of impacts and vulnerability, the distribution of costs and benefits associated with trade-offs, and the identification of a broader range of response options that are available in a specific context”. It also states that among the most difficult challenges of ecosystem management is the lack of alliance between political boundaries and units appropriate for the management of ecosystem goods and services.

Stakeholder participation and analysis is a key element of forest and ecosystem services valuation (Graves *et al.*, 2009). Graves *et al* (2009) state that there are signs that forest valuation is evolving to include “more deliberative *participatory methods* and that international and national development agencies are also showing much interest in forests and ecosystem services valuation which reflects greater commitment to *citizen participation* and to policies that promote social and environmental, as well as

economic outcomes”. There is the need for stakeholders to build synergies in the management of forests because of their various interests. As a particular natural resource can deliver different ecosystem goods and services to different stakeholders (Bromley, 1991; Baltzer, 1998; Adger and Luttrell, 2000), it is desirable to ensure the participation of all key stakeholders if sustainability and consensus on use is to be achieved (Jasper and Aberu, 2010).

Issues of ownership can also be critical in forest management. ND-HERO (2006) argue that the involvement and understanding of local communities and indigenous people in the management of the forest resources is particularly important where forests are under private ownership or in customary tenure. Examples of issues related to the management of forest resources in the Niger Delta include:

- Who owns the forest stocks producing the flow of benefits to stakeholders?
- Who controls the flow of benefits from forest resources, i.e. who determines how, where, and when resources are used?
- Who has access to the forest resources?

The evidence (see Section 2.3.3) suggests that stakeholder participation is a key part of effective resource management as observed in Ethiopia, Kenya and Ghana (Ameha, 2016; Musyoki *et al*, 2016; Rikiatu *et al*, 2016; Aheto *et al*, 2016). It is therefore an assumption of this thesis that the inhabitants and communities in the Niger Delta should be involved in the management planning process as they depend on the forest resources for their livelihoods.

1.2 Research aim and objectives

Given the above background, the aim of this research is to appraise local community dependency and involvement in forest resources management in the Niger Delta in order to develop a framework for the sustainable management of forest resources that includes local communities as key stakeholders in the process. **In other words, what is (are) the role(s) of rural community dwellers in the sustainable management of the Niger Delta forests and how can the forest resources be better managed?**

The future of the Niger Delta forest and its benefits to local stakeholders depends on the continued delivery of forest's goods and services within a stable ecosystem. This is threatened by many factors that are likely to become increasingly acute in the future, reducing the flow of ecosystem benefits to local people. Also, as pressure on these resources increases and the delivery of ecosystem services changes, it is anticipated that there will be increase in resource conflict, deprivation, and local hardship. A clear management plan, which involves all key stakeholders in the region, will help to prevent this and contribute to the sustainable use of forest resources.

1.2.1 Specific objectives

More specifically, this research has the objectives of providing answers to the following questions:

- i. What ecosystem services does the Niger Delta forest provide? How aware are the people of these services?
- ii. Who are the stakeholders of the Niger Delta forests? What are their levels of interest in / influence over, the forest resources?
- iii. Are the rural community dwellers involved in the management of the forests?
- iv. What is (are) the forest management option(s) presently adopted? How effective is it (are they) in ensuring the continuous flow of the forest ecosystem services?
- v. How can the Niger-Delta forest resources be better managed? What improvements can be made to the present management strategy? What role can the stakeholders play?

1.3 Expected outcome

It is initially observed that the current approach to managing the Niger Delta forest does not involve the active participation of local communities. It is anticipated that this research will identify ways to involve all key stakeholders in the management of the forest ecosystem of the Niger Delta; stakeholders and their interests will be identified, and a participatory framework for the sustainable management of the Niger Delta Forests will be proposed.

1.4 General approach

To achieve the stated objectives, a desk study was first undertaken which provided direction for the rest part of the research work. The entire work was based on three guiding frameworks: the livelihoods framework; the ecosystem services framework; and stakeholder analysis. The fieldwork, which started with a preliminary communication with the rural communities in June 2013, ended with the forest-stakeholder workshop held in December 2014. The entire fieldwork was carried out in Bayelsa State, Niger Delta, Nigeria. Stakeholders in the utilisation and management of the Niger Delta forests were identified (including forest communities, government agencies, private sector organisations and civil society groups) and interviews conducted to yield primary data. A forest stakeholder workshop was thereafter conducted during which stakeholders were able to discuss their interests and ways to sustainably manage the forest resources.

The social research method employed in the survey involved both the deductive and inductive approaches, which yielded both quantitative and qualitative data (the two approaches were used separately to achieve results for different aspects of the research). The guiding frameworks were applied both in the collection and analysis of field data to fully resolve the study objectives.

1.5 Outline and structure of the thesis

The thesis is divided into nine chapters (Figure 1-1); it includes this introduction chapter, which provides a background context to the research, a justification for the study, and an outline of the aim and objectives.

Chapter 2 is entitled “Guiding frameworks for the research”. These frameworks, derived from the literature, gave direction to the research. They are the livelihoods framework, the ecosystem services, and the stakeholder participation / analysis frameworks.

Chapter 3 is a method chapter describing both the deductive and inductive approaches. The chapter explains the semi-structured interview process and the identification of stakeholders.

Chapters 4, 5, 6 and 7 are results chapters, which have been written in the form of publication papers. Chapter 4, entitled “SUSTAINABILITY OF LIVELIHOODS IN THE NIGER DELTA COMMUNITIES” and Chapter 6, entitled “POLICY AND INSTITUTIONAL ANALYSIS FOR SUSTAINABLE MANAGEMENT OF NIGER DELTA FORESTS” were used to develop a paper titled ‘towards the sustainable management of the Niger Delta forests, Nigeria’ and has been published by the *International Journal of Innovations in Environmental Science and Technology* (Volume 5 number 1, 2015, pp 64-74); it evaluates various forest management options that have been adopted in the Niger Delta and also appraised their effectiveness (see Appendix E). Chapter 5, entitled “ECOSYSTEM SERVICES OF THE NIGER DELTA FORESTS” has been published by the *Journal of Agriculture, Forestry and Social Sciences* (Vol.14/1, 2014; pp 38 - 58). This paper discussed the ecosystem services of the Niger Delta forests, their abundance as well as importance to the local people (see Appendix F). Chapter 7, entitled “STAKEHOLDER ANALYSIS AND PARTICIPATION” presents identified stakeholders and their subsequent classification as ‘crowd’, ‘key players’, ‘context setters’ or ‘subjects’. This chapter also presents the network analysis that was undertaken during the stakeholder workshop held in December 2014, and examines the synergies and conflicts that exist in stakeholder relations.

Chapter 8 is a synthesis chapter, which discusses the outcome of the research and provides recommendations while Chapter 9 provides a conclusion and summarizes the research outcome relative to the objectives.

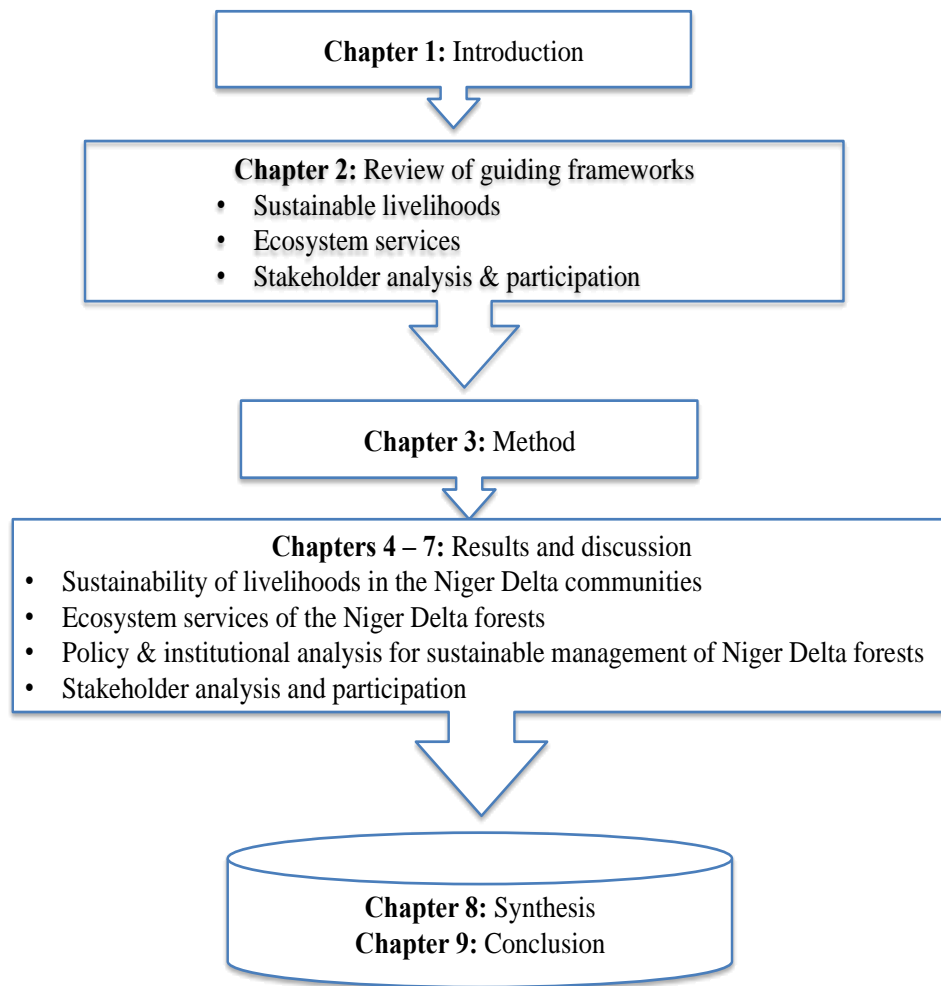


Figure 1-1. Diagrammatic representation of the thesis structure

1.6 Challenges of conducting research in the Niger Delta

Nigeria, for many different reasons is an extremely challenging country to undertake research in, even for, as I am, a native of the country. Whilst in Europe and other western states, excellent physical and electronic infrastructure, and excellent data on the environment, natural resources, local populations, policy, and previous research, facilitate the process of research; the same is not true for Nigeria. Inevitably, these challenges limited the scope of this research, limiting the number of communities that could be visited and the number of people who could be interviewed and surveyed, as well as the data that could be used for example to triangulate findings.

Most critically limiting to research in the Niger Delta is the issue of personal safety. There have been periodic kidnappings in the Niger Delta of foreign as well as of Nigerian nationals. There are still many incidences of kidnap-for-ransom in the region. Kidnapping is particularly dangerous during election campaigns and for this reason, research was only conducted where a local contact person was able to accompany me. In some areas, the engine of the car would be left running and the car door would be left open, to allow for a quick exit from the area in case of potential trouble. Thus, whilst research can be undertaken in the Niger Delta, the issue of personal security greatly influenced the choice of where and how to collect primary data and limited the number of communities that could be investigated. The initial design for example, of the thesis foresaw investigation in three rural communities in the area, but after several kidnapping events during the heightened tensions of the elections, it was decided that the final rural community should be exchanged to undertake research in Yenagoa, the capital city.

Information on the ecosystem services and environmental resources in the Niger Delta is extremely limited. Academics and researchers at research organizations publish little of the work they undertake in a form that can be easily accessed. Obtaining basic information from government agencies, such as population data, [was tremendously time-consuming to obtain](#). [Data that can be accessed in a matter of minutes in the UK, such as maps showing designations, take weeks to obtain, or may even need to be constructed from first principles](#). [For example, there were no maps that showed forest](#)

conservation areas in Bayelsa State. Nor were any policy documents available to explain how the forest reserves were created, or where they were located. Figure 3-3 for example, showing the location of the forest reserves had to be constructed manually by taking the co-ordinates of the reserves and plotting. Identifying where this information was and who could provide it took many repeated visits to a range of government departments. This lack of even basic information on the Niger Delta greatly extended the preparation time needed for primary data collection.

Lack of infrastructure and other amenities, such as stable electricity, good and reliable Internet connections, good communication networks, and good road networks, also made data collection and use of information technology challenging in the Niger Delta. A journey of a few kilometers may take hours, and some parts of the Niger Delta, are only possible by boat, adding greatly to the remoteness of rural communities. This ruled out many of the communities in the forest reserves that could have been used for this research.

Given the background of kidnapping and the sometimes-difficult relationship between people and state in Nigeria, developing relations of trust with stakeholders in order to interview them was difficult and took much time. Some people were suspicious as to why information was being collected, and as a result of this, visits had to be repeated many times to build rapport and trust, until gradually, the interviewee had the confidence to answer my questions. This added greatly to the time needed to obtain interview data. Others, for example, very poor stakeholders, wanted monetary compensation for their time (Laws et al, 2013).

The belief systems of the people and the political environment were also a limiting factor. This sometimes limited what kind of questions could be asked or influenced what type of response could be obtained. For example, questions about population size and income, relationship with neighboring communities and resources that are available in their forests could be misunderstood.

There were difficulties in setting up meetings. Politicians and other persons in high office are notoriously difficult to access. Many telephone calls and often, many repeated physical visits had to be made to some of the stakeholders before an interview could be held, even after agreement for the times and dates of those interviews had been agreed upon.

1.7 Contributions to knowledge

This research, despite the challenges faced, has achieved the following contributions to knowledge:

- i. **Provision of new baseline data:** Little baseline data exists in the Niger Delta making resource management extremely challenging. A key achievement of this thesis has been to provide new baseline data, on physical reserves (point ii), stakeholders (point iii), and ecosystem services (point iv) in the area.
- ii. **Map of Bayelsa State forest reserves:** There was no map available for the research, which showed the locations of the government-constituted forest reserves in Bayelsa State. This research has produced this map (Figure 3-3) for the first time. This will be useful to other researchers.
- iii. **Identification of stakeholders in the Niger Delta forest:** Prior to this research little data existed on who exactly, the stakeholders in the Niger Delta forests were, and still less existed to explain how stakeholders made use of and benefitted from the Niger Delta forests. This research has for the first time identified those stakeholders with interest in and influence over the Niger Delta forests, and has gone on to identify synergies and conflicts between stakeholders through mapping and quantification of stakeholder interest and influence.
- iv. **New data on how rural communities benefit from the ecosystem services of the Niger Delta forest:** A baseline dataset on ecosystem services and stakeholder participation has been established for the Niger Delta region of Nigeria. Prior to this, little research existed on how rural stakeholders in the Niger Delta benefit from forest resources. This research has engaged directly with a range of stakeholders to identify what these benefits are and how they are derived.

- v. **Networking of forest stakeholders:** prior to this research work, there was no interaction among forest stakeholders in Bayelsa State so it was impossible to discuss issues of common interest i.e. the forest ecosystem and its sustainability. The convening of a forest stakeholder forum, was a unique and major achievement in this regard, and allowed stakeholders to meet to discuss forest resource issues together in order to agree on the requirements for a possible future road map.
- vi. **Identification and specification of a way forward for participatory forest management in the Niger Delta:** A key outcome of this thesis has been to identify how resource-use conflicts in the Niger Delta Nigeria can be reduced using a stakeholder-led process of engagement. This has been achieved by using a set of new approaches to collect data and undertake research using a set of tools and concepts that are novel to the Niger Delta. The use of concepts from ecosystem services, stakeholder analysis, and livelihoods approaches have been little used in the region by either government or non-government organisations. By making use of these tools, the thesis has provided new insight in the origins of resource-use conflict in the area, identifying the great range of stakeholders in Niger Delta forests, how forest are important in their livelihoods, and how they contribute to their livelihoods. This stakeholder led approach has been used to identify and specify a way forward for the future, to ensure that current benefits from the Niger Delta forests, that are so critical in the livelihoods of current generations continue to be enjoyed in the future.
- vii. **Synthesis framework for application of an ecosystem services, livelihoods, and stakeholder approach to natural resource issues:** As part of point (i), a synthesis framework for future use in the Niger Delta has been established i.e. the three guiding frameworks for this research (ecosystem services, livelihoods framework and the stakeholder analysis) has been synthesized into one framework (Figure 3-6). The framework is novel in the Niger Delta, and established as a core principle of good governance, that trusts and confidence among stakeholders needs to be built for successful resource-use. The synthesis framework highlights the central role of stakeholder interests and influence in

effective management of ecosystem services and resilient livelihoods in order to achieve human wellbeing objectives.

1.8 Disclosure

The whole of this work, except for input from my supervisors, is entirely mine.

2 GUIDING FRAMEWORKS FOR THE RESEARCH

This section describes the relevant frameworks that became the guide for the rest of the research work. Three frameworks were used to shape the research work: 1) the sustainable livelihoods framework, 2) the ecosystem services framework and, 3) the stakeholder analysis and participation framework. These frameworks were used to determine how and what primary data needed to be collected and how they are to be analyzed and presented.

2.1 Introduction and background

Throughout the world, there are many links between the environment and human wellbeing and vibrant ecosystems are important to the livelihood of forest dwellers (Swallow *et al*, 2007). It is estimated that about 90% of the world's poor depend on forests for a reasonable portion of their earnings (World Bank, 2002; Forest People, FPP 2012; Food & Agricultural Organisation, FAO 2015). In Africa, it has been noted that a great proportion of its 600 million people depend on forest ecosystems for their livelihoods (Anderson *et al*, 2006; Arnold & Townson, 1998; Kaimowitz, 2003; Centre for International Forestry Research, CIFOR 2005).

In Nigeria, forests are an important component of the natural capital base of many people and they play key roles in their livelihoods (Arowolo *et al*, 2014; Inoni, 2009). The primary occupation of most people in the rural areas of Nigeria is farming and trading; they depend almost entirely on resources from their environment (Adekunle *et al*, 2011; Okunola, 2011). The environment supplies immediate family needs such as food and also income from the sales of harvested items; this income can be used to provide healthcare and education, and build infrastructure.

In Nigeria, it has been found that forests contribute to the livelihood of Nigerian households in several ways (Aruofor, 2001). Angelsen & Wunder (2003) describes the importance of timber and NTFPs to the livelihoods of the rural dwellers and this is likely to increase as human population rises. Many others have also reported the importance of wood and other forest resources to the local economy and national development (Shackleton & Shackleton, 2004; Vedeld *et al*, 2007; Bryon & Arnold,

1997). Since medicinal plants are also a part of the environmental services obtained from natural capital, it follows that ecosystem services also contribute to healthcare.

The Millennium Ecosystem Assessment (MA, 2005) emphasized that the degradation of ecosystems pose a threat to achievement of the millennium development goals. The World Health Organisation, WHO (2002) reports that up to 80% of the population of developing countries depend on biological resources for their medical needs. Adekola & Fanen (2015), report that “cultural services provide physical setting where the cultural identity of local communities materializes, and provides the right place to generate economic opportunities relating to traditional and indigenous skills”. Cunningham *et al* (2008) also describe the importance which “landscape; places of socio-cultural, religious and symbolic values” have on human wellbeing. The interrelated nature of the many ecosystem benefits and development of human capital is also supported by Hyvarinen & McNeill (2003) and the International Union for Conservation of Nature, IUCN (2008).

The link between ecosystem services and human wellbeing is now better understood. This knowledge has helped in policy and planning. There is now an understanding that what happens in one section of the ecosystem affects the other sections because it is an integrated system (Fisher & Turner, 2008; Fisher *et al*, 2009; De Groot *et al*, 2002). Sustainable development cannot be achieved if ecosystem services are destroyed. Verchort (2008) describes how good management of ecosystem services can enhance food security, livelihoods and wellbeing. The destabilization or destruction of ecosystems on the other hand has negative effects on sustainable development (International Institute of Sustainable Development, IISD 2009; Dieudonne, 2001).

However, the area and quality of tropical forests is being degraded at an unsustainable rate (Okojie, 2007). Houghton (2003) estimated that Sub-Saharan Africa contributes to about 15% of total global deforestation and carbon dioxide flux to the atmosphere while Oyebo (2006) put the deforestation rate at 3% per year in Nigeria. The FAO (2005) went further to state that Nigeria has the highest level of deforestation in the world. This report put the loss of primary forest between the year 2000 and 2005 at 55.7%.

Onojeghuo & Onojeghuo (2015) used a combination of remote sensing and ground data to ascertain the extent of forest cover changes in 13 selected protected forest areas in the Niger-Delta over the period 1986 – 2014; they found that there had been more deforestation in the protected forest areas than afforestation.

This loss of forest cover has resulted in a decline in biodiversity in the Niger Delta (Phil-Eze & Okoro, 2009). The UN (2002) reported that many important species are now extinct in Nigeria. Osemeobo (1988) reported an increase in the rate of forest depletion in Nigeria as human population increases. Adekunle *et al* (2011) and Osemeobo (2001) attributed most of these losses to human activities; he listed bush-burning, logging, conversion of forestland to farmlands and that forest exploitation is not being done in a sustainable manner. Ravilious *et al* (2010) also concluded that Nigeria suffers from a high rate of forest loss due to same human factors already listed.

Chukwuone & Okorji (2008) reported that the many conservation areas set up by the government have been ineffective because of neglect and lack of further investment in them. Arowolo *et al* (2014) advocated the involvement of dwellers of the rural communities in the processes of planning for the conservation of forest resources.

The lack of data on forest resources is a limiting factor to management of forest resources in Nigeria (Adekunle *et al*, 2011). Schoneveld (2014) says that policy shift also contributes to forest loss and tension in the rural areas. Aweto (1990) in his paper on plantation forestry and forest conservation in Nigeria argued that it is “ecologically unwise to clear-fell reserves of native rain forest and replant them with monoculture tree plantations”. All of these will eventually impact on the source of livelihood of the rural dweller. According to Grandwohl *et al* (2013), “the destruction of the tropical forest is one of the major problems of our time. Vast areas are rapidly becoming wastelands which support only a few tough weeds, perhaps some cattle, and the farms allowed to the poor”.

The livelihoods of rural communities in the Niger Delta are often insecure and vulnerable. Key policy drives in Nigeria at different times have included strengthening

rural livelihoods, aimed at making them more secure and sustainable. There have been programmes such as the *Mass Mobilization for Self-reliance, Social justice and Economic Recovery*, MAMSER (Bisis, 1987; Stephen, 1998; Amucheazi, 1991); the *Directorate for Employment, Food and Rural Infrastructure*, DEFRI; the *National Directorate of Employment*, NDE (Ajadi, 2010; Usiwoma *et al*, 2005; Nwaka, 2005), and the *Better Life for Rural Women* (Bola, 1995) programmes. These programmes had tended to be effective only whilst their sponsors were in power but quickly declined when their sponsors lost power.

Development in the Niger Delta has recently been largely based on the presence of crude oil and the assumption that this will continue to provide for development needs. However, it is clear that the proceeds from oil have done little to benefit many communities and the importance of the Niger Delta forests in the lives of many rural dwellers will continue to increase.

2.2 Participatory forest management (PFM):

For many years, developing countries have been faced with the challenge of sustainably managing their forest resources (Coulibaly-Lingani *et al*, 2014). Adopted strategies in the past have excluded local communities simply because the needs of the local people have been viewed as opposed to biodiversity conservation objectives (Adams & Hulme, 2001; Vodouhe *et al*, 2010). The top-down approach has not been effective in curbing deforestation and loss of biodiversity (Guthiga, 2008; Ameha *et al*, 2014b). The failure of the top-down forest management approaches according to Rikiatu *et al* (2016) has made forestry officials see communities as the agents of destruction of forests while communities have regarded forestry officials as their enemies, whose requests or orders must be flouted so as to meet their own subsistence needs.

Since the 1980s, there has been increasing effort at incorporating the needs of the local people into forest conservation planning (Ribot, 2001; Hutton & Leader-Williams, 2003) especially as the top-down approach has failed to produce results. This new approach which is referred to as Community Based Natural Resources Management (CBNRM) and or Participatory Forest Management (PFM), permits forest communities,

especially those in designated protected areas, to participate in forest management and planning, in order to link conservation objectives to the needs of the local forest dwellers (Adams & Hulme, 2001; Hutton & Leader-Williams, 2003). PFM is thus seen as an essential strategy in promoting forest resources governance (Matta & Alavalapati, 2006). According to Campbell (2009) PFM was introduced as a governance option in the late 1970s as a result of the degradation and deforestation in government owned forests and because government forest protection policies had failed to achieve their objective of improving the wellbeing of community people (Kumar, 2002; Lund & Treue, 2008; Persha *et al*, 2011).

Agrawal *et al* (2008) state that PFM, and other variants of PFM such as Community Forest Management (CFM), and Community Based Forest Management (CBFM), “refer broadly to forest use and governance arrangements under which the rights, responsibilities, and authority for forest management rest, at least in part, with local communities”. This concept proposes that sustainable forest management will be achieved when “local communities manage local forests and get access to direct benefits from participating in forest management” (Agrawal and Ostrom, 2001; Ostrom, 1990). Yamaki (2016) defines public participation in forest management as “the involvement of non-state actors such as people and organized groups in a process where they can exchange information and express opinions about the policy-making process” and states that this provides an effective tool for overcoming conflicts caused by the diverse needs that different stakeholders have for forest resource use. PFM encourages and promotes community and other stakeholders’ participation in the management of forest resources.

Local collective action is therefore a cardinal principle of PFM and local dwellers can play very active (managerial) roles while the external stakeholders’ role is supportive rather than managerial (Ostrum, 1990; Arnold, 1991). PFM has been practiced with the objectives of enhancing forest resources conservation, poverty reduction and achievement of rural community development (Agrawal and Gibson, 1999; Agrawal *et al.*, 2008; Andersson *et al.*, 2004; Ribot *et al.*, 2006; Somanathan *et al.*, 2009). Much research has found that PFM has made forest management more effective than top-down management regimes (Klooster and Masera, 2000; Gautam *et al.*, 2002; Benneker

and McCall, 2009; Blomley et al., 2008; Takahashi and Todo, 2012; Thoms, 2008; Crook and Manor, 1994; Ribot, 2003).

Successes in PFM have been achieved where attention have been paid to employment and increased participation (Blomley *et al*, 2008; Conroy, 2001; Matiku *et al*, 2012; Treue *et al*, 2014). Sensitivity to local needs such as the people's traditions and socio-economic realities also affect the outcomes of PFM strategies (Rikiatu et al, 2016).

Participative forest management improves the quality of decision-making because it facilitates exchange of information and ideas amongst the participating stakeholder groups and promotes social learning and mutual problem analysis and solutions. Public participation is thus considered a decision making tool that has the ability to reduce conflicts among stakeholders and achievement of more sustainable decisions (Aasetre, 2006; Kangas et al, 2010; Maier et al., 2014; Reed et al., 2009). The normative goal of participation is said to promote democracy and social learning because it improves the chances of all categories of stakeholders to get involved (Armitage et al., 2009; Reed et al., 2009); it enhances trust and encourages public support for decisions (policies). Participation has the possibility of “transforming relationships, creating new relationships, changing adversarial relationships and enabling participants to identify new ways of working together” (Stringer et al., 2006); it also leads to collaboration (Davies and White, 2012).

PFM has been used in China (Liu and Innes, 2015) where it is now a dynamic and evolving process aimed towards sustainable forest management supported by fiscal policy. PFM is also yielding results in Tanzania and the funding from the REDD+ programme is being used to expand it there (Newton *et al*, 2015). Some other countries where PFM is being used include Ghana (Rikiatu et al, 2016), Kenya (Matiku et al, 2013; Musyoki et al, 2016), Republic of Benin (Kisito et al, 2017), Mozambique (Irmeli, 2006), Ethiopia (Solomon et al, 2016; Ameha et al, 2016; Alemayehu et al, 2015), Malawi (Senganimalunje *et al*, 2015) and Laos (Irmeli & Jens, 2009).

In Ethiopia, Ameha *et al* (2016) found that PFM was more successful in making forest

management sustainable than the government's approach to management; collaboration reduced conflicts over forest resource use and supported local livelihoods. In Central Ethiopia, the provision of alternative livelihood activities as part of PFM reduced illegal forest resource exploitation (Bekele & Ango, 2015). It was concluded that PFM approaches yielded better results than authoritative governance approaches in bringing about change in a society where there were conflicts as a result of multiple natural resource interests, particularly because these conflicts were resolved by sharing benefits and responsibilities (Bekele & Ango, 2015). Similar positive results were reported in Malawi (Senganimalunje *et al*, 2015). Based on these examples, it is anticipated that the application of PFM in the Niger Delta, where there is conflict over natural resource exploitation, could lead to the achievement of communal peace and sustainable forest resources management.

African countries are beginning to embrace the concept of participation, allowing all stakeholders, especially the communities to participate in forest resource management. In Kenya, the Kenyan Forest Act of 2005 (Musyoki *et al*, 2016), allows community forest associations to participate in the management of forests in order to improve forest cover and rural livelihoods. In Ghana, a government policy, formulated in 1994 and known as "The Forest And Wildlife Policy", provides the basis for community participation in forest management (Rikiatu *et al*, 2016) and as a result of this, policy makers and coastal management practitioners in Ghana embraced the concept of participatory management of coastal resources (Aheto *et al*, 2016), resulting in local people participating in the conservation of the mangrove forests.

However, it is worth noting that despite such government policies, true participation can continue to be limited. For instance, community participation in the management of forest reserves in the Northern Region of Ghana was found to be very passive despite the government's policy (Rikiatu *et al*, 2016). Community participation was said to be 'tokenistic' because the community's involvement was merely limited to "boundary cleaning and provision of labour to the plantations". There existed no formal collaboration between the communities and the forest services division and Rikiatu *et al* (2016) concluded that weak implementation and bureaucracy was often a hindrance to

the good intentions of good policy. In China, Liu and Innes (2015) identified the challenges for PFM to include institutional barriers, little research, poor practices, and failure to replicate lessons learned from successful cases.

There is a low level of community participation in biodiversity management in Nigeria where rural dwellers are usually not formally educated and often oppose conservation initiatives, especially when the initiative is government driven (Eneji *et al*, 2009). In a study carried out in a donor initiated forest biodiversity conservation project in a National Park in Cross Rivers State Nigeria, it was concluded that people were not properly involved in the project and were not benefiting from it (Eneji *et al*, 2009). Thus, various authors have stated that participation requires the involvement of the rural end users themselves, taking up key roles in the forest management process (Aheto *et al*, 2016; Rikiatu *et al*, 2016). The aim of such participation then helps to foster cooperation and improve the outcome and sustainability of forest management (Balest *et al*, 2016).

Sudrajat *et al* (2012), Grimble and Wellard (1997), Grimble and Quan (1993), Grimble *et al* (1994), Jasper and Abere (2010), and LENF (1998) have all argued that decision-making concerning people and the environment is more effective when all the different and relevant stakeholders participate. In this respect, stakeholder analysis can help to build cooperation amongst different stakeholders because for instance, whilst the objectives of government regarding forest management might be different from that of the communities or other stakeholders, the ultimate aim of sustainably managing the forest is often common to all stakeholders. Whilst designing programs that will adequately satisfy the objective of different stakeholder groups is clearly challenging (Angelsen, 2009), such points of synergy between stakeholders can form the beginning of negotiations and cooperation (Newton *et al*, 2015).

There are conditions that improve the acceptance of PFM by the forest dwellers. In their study, Aheto *et al* (2016) found that livelihoods and economic benefits were the primary motivators for stakeholder participation in mangrove restoration and management in Ghana. This was similar to the conclusion drawn by Musyoki *et al* (2016) when they

evaluated the factors that influenced the participation of the Community Forest Associations in forest management in Kenya and found that access to the benefits derived from the forest was the main driver. In Nigeria, Amoru (2000) argued that policy and development had tended to ignore the needs of those stakeholders who depended on forests for their livelihoods and as a result, the outcomes had been ineffective and unsustainable. Thus, Newton *et al*, (2015) argues that creation of incentives to reduce deforestation should include initiatives that generate socio-economic benefits for the forest-product dependent rural dwellers.

The success of PFM also depends heavily on the capacity of communities to create strong institutions, as well as their extent of rights of access and control over forest products (Charnley and Poe, 2007). Poor institutional arrangements and conflicting economic interests of vital stakeholders are hindrances to a successful PFM (Irmeli & Jens, 2009). Thus, building in local capacity that allows communities to assert their rights and demand commitment from the national government is key to successful PFM (Irmeli, 2006; Irmeli & Jens, 2009). Successful PFM also requires an analysis of stakeholders' perceptions and preferences (Paletto *et al*, 2016). Furthermore, community structures will need to be built, especially in the areas of coordination and monitoring (Newton *et al*, 2015). Participation, accountability and responsiveness are other key institutional conditions recommended by Khartun *et al* (2015) for the success of any PFM program.

It has been argued that existing community forest management institutions are often effective in managing forest resources (ND-HERO, 2006) and that therefore one approach to establishing sustainable institutions is to build on existing community forest management methods. For this reason, Newton *et al* (2015) recommended that in Nepal and Tanzania, the design and implementation of the REDD+ should build on the experiences of community forest management. The strength of community forest management initiatives include the existing environmental, social, human, and institutional capitals, which have been built up over many previous decades, which also included much experience of such participatory initiatives.

When PFM is to be introduced into a new environment, there is the risk that the introduction of a new element in the already existing community forest management system could disrupt the already established ecological and institutional status of the area. Such changes could either be positive or negative (Benneker and McCall, 2009; Putz and Redford, 2009). Blaikie (2006) has also cautioned that PFM can often fail to achieve the theoretically predicted outcomes.

Because PFM places restrictions on how forest resources are utilized or extracted as a result of new rules and regulations (Larson and Pulhin, 2012), it sometimes lead to a reduction in forest based income for some households (Schreckenber and Luttrell, 2009). To mitigate this negative effect, other alternative income generating activities and enterprises can be introduced (Gobeze et al., 2009). Khartun *et al* (2015) listed some other challenges facing the implementation of PFM to include conflicts arising from governance restructuring, elite capture and illegitimate benefit sharing, participation (i.e. ensuring full participation of all relevant stakeholders) and cultural norms. Thin & van Gardingen (2004) and Blomley & Ramadhani (2006) suggest that PFM initiatives need to be main-streamed into local institution so that it becomes more effective. Given these risks, it is often suggested that PFM implementation should be done first at a pilot scale, which can then be replicated when all necessary lessons have been learnt. Despite these risks, there are lessons that future PFM can take from existing PFM or adopt from community initiatives given the experiences and reported successes (Arnold, 2001).

PFM initiatives sometimes struggle after the withdrawal of external funding agencies, but this can be resolved if the government continues to support PFM with funding (Irmeli, 2006). To make the PFM initiatives sustainable, attention should be paid to building partnerships from the community upwards, instilling in local people a sense of ownership of the PFM. Emphasis should be placed on how to ensure a successful transition of the facilitation role played by local governments or institutions after the withdrawal of any external funding agencies involved. The importance of the role of forestry extension staff in building the capacities of the local people for PFM should be

recognized, especially when the management of critical forest resources is involved (Irmeli, 2006).

The reasons for the introduction of PFM in Ethiopia (Ameha *et al*, 2014b; Kubsa *et al*, 2003; Temesgen *et al*, 2007) hold true for the Niger Delta. As in Ethiopia, in the Niger Delta, the centralized management of forests has also been unsuccessful (ND-HERO, 2006); it is therefore considered that the active participation of the communities, who hold a major stake in the forest, will be an effective strategy to achieve sustainable forest management. It is believed that the forest is a natural capital asset that is capable of lifting the communities out of poverty (Jasper & Abere, 2010).

Decentralizing forest management will achieve results in Nigeria (ND-HERO, 2006). Decentralization, where a central government formally cedes some of its powers to lower level institutions in a political or administrative hierarchy (Ribot, 2004), could happen in one of two ways. Firstly through “deconcentration”, whereby the central government gives some of its powers to lower level institutions within an administrative hierarchy and secondly, through “devolution”, where powers are ceded by the central government to a democratic local government (Agrawal and Ribot, 1999; Crook and Manor, 1998). Of the two options, it is considered that devolution is likely to be most effective in Nigeria, since Nigeria operates a three-tier government system, at the federal, state, and local governments. Through devolution, a number of authors (Senganimalunje *et al*, 2016; Warner, 2000; Menzies, 2002) believe that PFM could help to promote good governance as well as sustainable forest management and livelihoods.

A number of case studies (Box 2.1) have been developed as examples for PFM programmes.

Box 2.1 Participatory forest management case studies

Ethiopia:

PFM has been practiced in Ethiopia since the 1990s. This has been possible with the help of a British international NGO, FARM Africa/SOS, and a bilateral organisation, the German Technical Cooperation, GTZ, (Temesgen et al., 2007). In this arrangement, the government has the ownership rights to the forest while the local communities are organised into forest user groups (FUGs) as users of the resources.

The condition of use is that the FUGs, at the minimum, maintains the level of forest cover as at the time of introduction of the PFM. The members of the FUGs are usually from the same community and live close to the forest to be designated for PFM purposes. Extraction of forest products for commercial purposes is not permitted at any of the sites except for one at Adaba-Dodola. The FUGs elects their own officials who manage the day-to-day running of the group. Laws and penalties are drafted by the FUGs to guide operations. The agreement between the government and the FUGs can be revoked if the forest cover is reduced or if the government needs to use the forest area for other important national objectives. Because of the success of these projects, national scaling up of PFM is being planned (Ameha et al, 2014a).

Amente, (2005); Bekele et al., (2004); Gobeze et al., (2009); Takahashi and Todo, (2012) report that there have been improvements in forest condition and income of the participants since the introduction of PFM in Ethiopia. Ameha et al, (2014a) found that commercialization of timber in PFM sites appears to be a viable pathway to sustainable forest management. They found in their study in Ethiopia that the forest where commercial harvesting of timber was permitted enabled the forest users to have better income than where only subsistence-use was allowed.

Tanzania:

Khartun et al (2015) described two types of PFM in operation in Tanzania (as extracted from the Tanzanian Forest Act of 2002): one is community based i.e. the Village Land Forest Reserves (VLFR); where the community holds all the associated rights and responsibilities, while the second is the Joint Forest Management (JFM); where the

communities and the government collaborates to manage the forest. For the JFM, it is reported that agreeing or reaching a compromise on benefit sharing has been a challenge.

In Tanzania, PFM is hinged on the village council (Irmeli & Jens, 2009); the village council has powers to declare the VLFR on village lands and is allowed to retain whatever proceeds they get from such forests. According to Irmeli & Jens (2009), the legislation is quite clear on the rights and responsibilities of the village council on the VLFR but somewhat ambiguous on the process of obtaining / losing such rights.

PFM implementation is focused on marginal lands i.e. low-value forest areas. Wily and Dewees (2001); Blomley and Ramadhani (2006) noted that the handing over of rights for PFM on marginal forests has progressed swiftly in Tanzania; and Lund (2007) stated that the villages are capable of generating enough income from non timber forest products (enough) for the management of the forest as well as finance some local level public amenities.

An issue with this PFM has been, to what extent the communities are allowed to extract valuable timber species for their own benefit and also the development of a taxation regime that satisfies all parties. In summary, despite the existence of legal framework as well as official support, there are administrative and financial issues (benefit sharing issues) that act as constraints on the implementation of PFM in Tanzania. This is more pronounced in those areas where the government authorities and civil servants feel they might lose control of financially valuable resources. Personal economic interest of forest officers in trading forest products and of politicians and civil servants is a constraint (Kobb 1998; Lund 2007; Fjeldstad 2001; Kelsall 2004).

Mozambique:

The role of the private sector and that of communities in the management of forest resources is recognized in Mozambique (Irmeli & Jens, 2009). Although the Land Law of 1997 confers land ownership on the government but when a community holds a legal land certificate, certain rights to natural resources are granted to such a community. By

acquiring this legal land certificate, the community is able to prevent outsiders from gaining concession rights to resources on their village forests.

There are problems in the implementation of this policy. The process of obtaining this legal certificate is costly and complicated thereby preventing many communities from having it (Irmeli & Jens, 2009). Also, there are loopholes in the law, which the private companies explore to still have access to the village forests (Nhantumbo 2000; Mackenzie 2005; Mustalahti 2007), as a result of this, the rights of local communities to the benefits accruable from their forest are compromised. Another issue is that even when the locals go into partnership arrangements with the private sector operators (these partnership negotiations are necessary because the entry barriers introduced by the law hinders the communities from engaging in forest utilization independently), they are only given employment opportunities and access to consumer goods (Norfolk and Soberare 2002). The attitude of the administrators and judicial officers also does not favor the local communities during negotiations between the communities and the private companies. The local patrol teams, which are supposed to help stop illegal exploitation of forest resources, are more interested in bribes (Irmeli & Jens, 2009). Another dis-incentive is that the community forests are mainly located in totally degraded or low value timber areas within a conservation area (Irmeli & Jens, 2009).

In Mozambique therefore, despite the existence of policy on community participation in forest management, the realities favors forest concessions to private commercial operators.

2.3 The guiding frameworks

In order to make the link between participation, ecosystem services, stakeholder livelihoods, and stakeholder wellbeing in the Niger Delta forest, this thesis applies three key frameworks from the literature as investigative and analytical tools, and considers their utility. These are: 1) the sustainable livelihoods framework, 2) the ecosystem services framework and, 3) the stakeholder analysis and participation framework.

2.3.1 The sustainable livelihoods framework

An objective of this research was to identify and appraise the livelihood strategies of the rural communities of the Niger Delta. The sustainable livelihoods framework was seen as a useful tool in this respect and more detail on it is provided in Chapter 4.

Livelihoods depend on various resources and means from which individuals and communities obtain their survival (Ezenwaka, 2002). Livelihoods are comprised of the capabilities, assets and activities required for survival and are considered to be sustainable when they can cope with, and recover from stress and shocks and meet present needs without undermining its abilities to supply the need of the future generation (Chambers and Conway, 1992; Carney, 1998; DfID, 1999).

The sustainable livelihoods framework (Figure 2-1) proposes that livelihoods are dependent on five types of assets: human, natural, financial, social and physical assets; these are discussed in more details in Section 4.1. Odero (2006) makes a case for “information” to be included as a 6th asset but a further examination will support that this could already be taken care of under human or social capitals. The livelihoods framework provides a means of understanding how people are vulnerable to shocks and drivers of change. It helps show how factors and processes such as policies, institutions, levels of governments and laws help determine the livelihood strategies of people and ultimately, the achievement (or otherwise) of their livelihood outcomes, especially wellbeing (Ashley and Carney, 1999; Carney, 1998; DfID, 1999). The livelihoods of people (especially of rural dwellers) are strongly linked to ecosystem services. The sustainability of livelihoods however, depends on an interplay of various factors, such as policies and institutions (Singh and Wanmali, 1998; Scoones, 1998; Ezenwaka and Abere, 2009; Ezenwaka, 2002) which the livelihoods framework identifies.

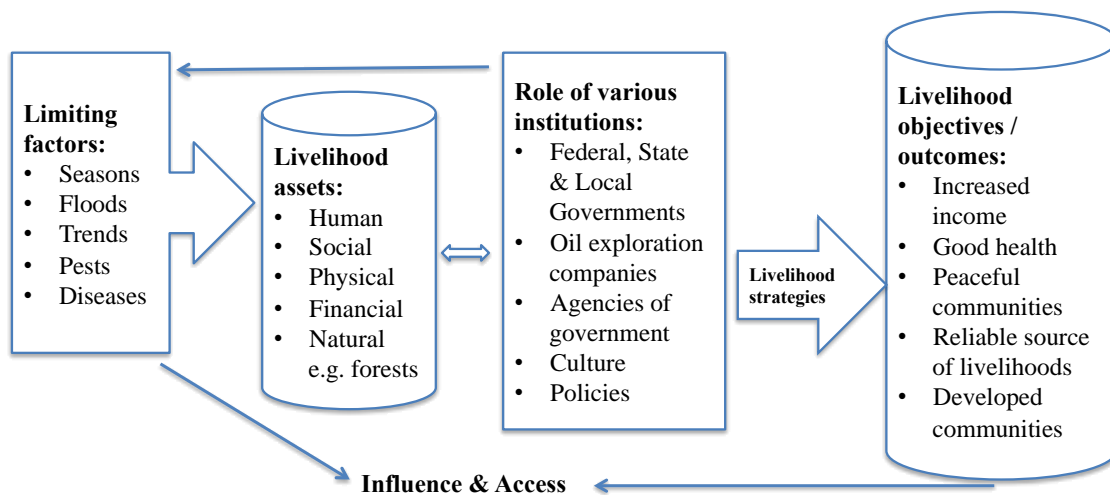


Figure 2-1. Livelihood Framework (after Carney, 1998; DfID, 1999)

The sustainable livelihoods framework is used within sustainable livelihoods analysis, which became a key approach in many international agencies for the implementation of development programmes from the 1990s (Morse *et al*, 2009). Generally, the approach tends to appraise the livelihood assets or capital of the people; their limiting factors as well as a wider consideration of other factors such as the political environment, and then proposes interventions, which reduce the negative impacts of the limiting factors and thereby enhance the achievement of the livelihood objectives of the people in a sustainable manner. Morse *et al* (2009) described sustainable livelihoods analysis as a “practical framework for evidence-based intervention”. The approach remains relevant as there are rapid changes in many developing country communities and because resources to support development interventions are limited.

According to Farrington (2001), sustainable livelihoods analysis can be explained as: (i) “a set of principles guiding development interventions” which ensures that the analysis should be bottom-up – that is that the beneficiaries must be involved; (ii) an “analytical framework to help understand what is available and what can be done”, which implies a thorough analysis of the livelihood assets and their vulnerabilities as well as an analysis of roles that institutions can play, and; (iii) a “development objective”, where the objective is to bring improvement to livelihood sustainability and make livelihoods assets more stable and able to withstand limiting factors.

The central point of the sustainable livelihoods analysis is the people. The emphasis is on the betterment of the livelihoods of the people. Carney (1998) explained it further that although the focus is on 'people', the approach still does not compromise the health of the environment and that the strength of the sustainable livelihoods analysis is in its mainstreaming of the environment within a holistic framework.

Solesbury (2003) traced the history of sustainable livelihoods analysis and describes how it has evolved to its current form. The earliest form of sustainable livelihoods analysis was in work funded in the 1960s and 70s by the World Bank *et al*, on integrated rural development projects. From this, Solesbury (2003) traced sustainable livelihoods analysis to its various forms in the 1980s and 90s and then in the 2000s to the World Summit on Sustainable Development, which was held in South Africa in 2002. Morse *et al* (2009) explained that although various components of the framework were highlighted at various times during this transformational journey, it might then appear as though nothing new has been added. But they note that the most important achievement in today's version of the sustainable livelihoods analysis is in it being able to bring all the various components together in a seamless framework.

Sustainable livelihoods analysis advocates the involvement of intended beneficiaries in planning and implementation of development interventions. In other words, it supports participatory learning ideals (Butler and Mazur, 2007). It also implies that multiple sectors have to be considered.

2.3.2 The ecosystem services framework

A key need in the research was to identify the nature and extent of the reliance of local communities on the forest ecosystem. In this respect, the ecosystems framework, Figure 2-2, (MA, 2005; De Groot, 2006; De Groot *et al.*, 2002; Gómez-Baggethun *et al.*, 2010; DEFRA, 2007; Fisher *et al.*, 2009), which explicitly links ecosystem functions and services to human well-being (livelihoods) was seen as a promising framework to help achieve this purpose.

The Millennium Ecosystem Assessment (MA, 2005) described an ecosystem as “a dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit” and the benefits that people derive from their ecosystems are collectively referred to as “ecosystem services”. A useful feature of the ecosystem services approach is how it shows the diversity of the beneficial flows from the natural environment and it provides a framework for recognition and valuation of both “in use and non-use” services (Graves *et al.*, 2009). Since the Millennium Ecosystem Assessment (MA) framework highlighted the critical dependency of humankind on the environment, and the degradation that puts that dependency at risk, the ecosystem services concept has been used as a means of identifying, categorizing, and valuing the benefits that ecosystems provide, and the concept is now firmly established as an analytical tool in policy agenda (Gómez-Baggethun *et al.*, 2010; Fisher *et al.*, 2009).

Ecosystem services are very important to the wellbeing and survival of people. Society depends on the continuous provision of ecosystem services for wellbeing and especially in poor countries where ecosystem services are fundamental in many people’s livelihoods. These services according to the MA (2005) include.

- i. *Provisioning services* such as food, fresh water, wood, fuel and fiber;
- ii. *Regulating services* that affect climate, flood, disease, and water purification;
- iii. *Cultural services* that provide recreational, educational, aesthetic, and spiritual benefits; and
- iv. *Supporting services* such as soil formation, photosynthesis (primary production) and nutrient cycling.

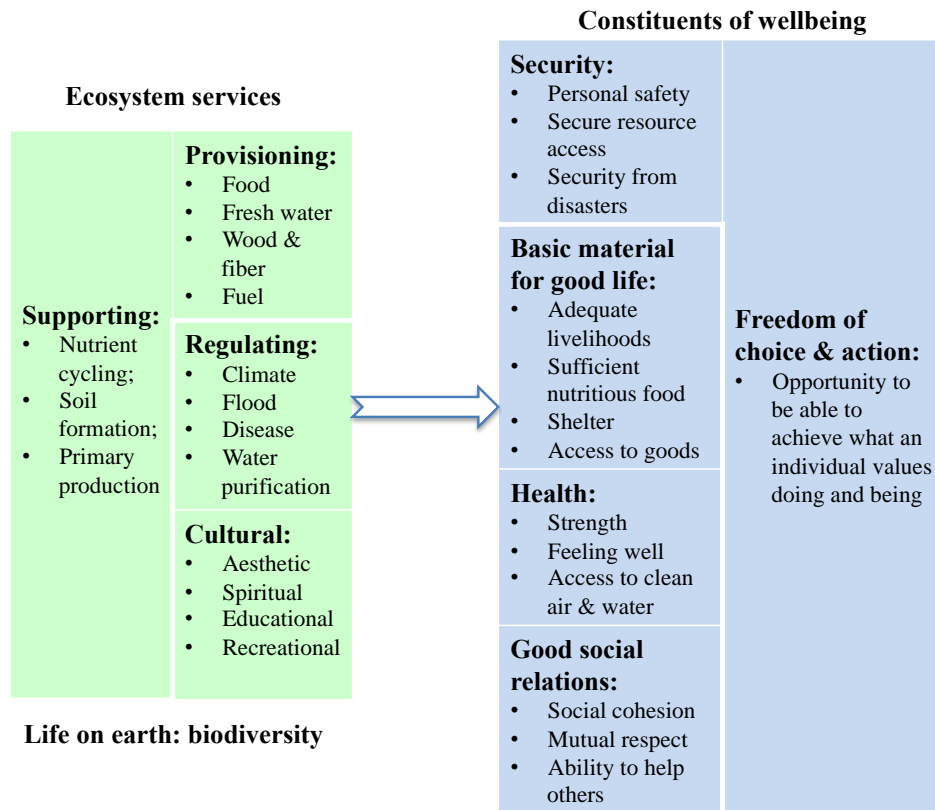


Figure 2-2. Ecosystem Services Framework (after MA, 2005)

Provisioning services consists of tangible benefits obtainable from the ecosystem, such as food, fibre, fuel, medicines and water. Regulating services refer to such benefits as air quality regulation, climate regulation, erosion regulation, water purification, disease and pest regulation. Cultural services refer to the benefits such as spiritual renewal, education, recreation, and aesthetic values of the ecosystem. Supporting services ensures that all other services are being produced; this includes services such as soil formation, photosynthesis, nutrient cycling and water cycling.

Example of benefits that are classified under each of these categories is further provided in Table 2.1.

Forests are one form of natural capital, and also in turn a livelihood asset (capital) identified in the sustainable livelihoods framework (Carney, 1998; DfID, 1999). Forests too support a number of interrelated ecosystem functions that have value for humans. It is worth noting that the application of the framework can also sometimes highlight the

dis-benefits of ecosystems. The application of this concept in research in Bedfordshire showed that some people perceive “dis-services” from community forests such as providing opportunity for “dog litter” and “fly tipping” (Agbenyega *et al.*, 2009).

Much work has been done in bringing to the fore, the many benefits that humans derive from their interactions with their immediate environment (MA, 2005; De Groot *et al.*, 2002; Gómez-Baggethun *et al.*, 2010; Fisher *et al.*, 2009; Agbenyega *et al.*, 2009; DEFRA, 2007). The Millennium Ecosystem Assessment’s Framework, is presently widely accepted and used as a means of categorising the benefits that human beings derive from their environment (DEFRA, 2007). This concept has continued to evolve but it is yet to gain grounds in Nigeria when compared to other countries like the UK, Netherlands and Australia.

One of the advantages of the ecosystem service framework is that it encourages people to consider the full range of benefits and dis-benefits obtained from ecosystems. Some services such as food, fibre, and fuel-wood have a direct impact on livelihoods and are more easily recognized and valued. However other services such as regulation of the climate, the purification of air and water, flood prevention, soil formation and nutrient cycling are less easily recognized and difficult to value, and take the form of “non-market, public goods whose values are difficult to directly ascertain” (DEFRA, 2007; Graves *et al.*, 2009). In line with the public goods theory, The *Living Economics* (in its article titled “Rivalry and excludability in goods”, 2006) and Wilcox (2003) referred to rival, non-rival, exclusive and non-exclusive goods. The rival goods are those goods whose benefits can be enjoyed by only one person at a time while the non-rival goods are those where several people can enjoy the benefits all at the same time - thus one person’s benefit does not exclude others from also benefiting from it. These public goods are difficult to value. This is a major reason why such non-market ecosystem services are frequently omitted within decision-making and policy appraisals (Isoun, 2006; DEFRA, 2007; Graves *et al.*, 2009). Often, the not-so-easy to be valued benefits that are provided to humans by the ecosystems are lost before their importance becomes clear (Adekola *et al.*, 2015).

The recognition and value of each ecosystem service varies greatly depending on whether the impact is direct or indirect. Those services that have a direct impact on livelihoods (such as food, fiber, fuel wood, some cultural services and recreation) can be more easily recognized and valued. Other ecosystem services that provide non-market public goods (such as regulation of the climate, the purification of air and water, flood prevention, soil formation and nutrient cycling) are often less recognized and more difficult to value (DEFRA, 2007; Graves *et al.*, 2009), hence these services are frequently omitted within decision-making and policy appraisals (Isoun, 2006; DEFRA, 2007; Graves *et al.*, 2009).

Table 2.1: Examples of ecosystem services (DEFRA, 2007)

Category	Examples of ecosystem services provided
Provisioning services i.e. products obtained from ecosystems	<ul style="list-style-type: none"> • Food e.g. crops, fruit, fish • Fibre and fuel e.g. timber, wool • Biochemicals, natural medicines and pharmaceuticals • Genetic resources: genes and genetic information used for animal/plant breeding and biotechnology • Ornamental resources e.g. shells, flowers
Regulating services i.e. benefits obtained from the regulation of ecosystem processes	<ul style="list-style-type: none"> • Air-quality maintenance: ecosystems contribute chemicals to and extract chemicals from the atmosphere • Climate regulation e.g. land cover can affect local temperature and precipitation; globally ecosystems affect greenhouse gas sequestration and emissions • Water regulation: ecosystems affect e.g. the timing and magnitude of runoff, flooding etc. • Erosion control: vegetative cover plays an important role in soil retention/prevention of land/asset erosion • Water purification/detoxification: ecosystems can be a source of water impurities but can also help to filter out/decompose organic waste • Natural hazard protection e.g. storms, floods, landslides • Bioremediation of waste i.e. removal of pollutants through storage, dilution, transformation and burial

Cultural services i.e. nonmaterial benefits that people obtain through spiritual enrichment, cognitive development, recreation, etc	<ul style="list-style-type: none"> • Spiritual and religious value: many religions attach spiritual and religious values to ecosystems • Inspiration for art, folklore, architecture etc • Social relations: ecosystems affect the types of social relations that are established e.g. fishing societies • Aesthetic values: many people find beauty in various aspects of ecosystems • Cultural heritage values: many societies place high value on the maintenance of important landscapes or species • Recreation and ecotourism
<hr/> Supporting services , necessary for the production of all other ecosystem services	<ul style="list-style-type: none"> • Soil formation and retention • Nutrient cycling • Primary production • Water cycling • Production of atmospheric oxygen • Provision of habitat <hr/>

The ecosystem services as an approach, is also useful in the achievement of a sustainable use of forest products and services as well as in the achievement of the desired goals of development initiatives (Adekola *et al*, 2015).

A critical look at early conservation work has suggested that it was focussed mostly on preserving the ecosystem and did not consider the role of people as part of the system (Amend & Amend, 1995). In Africa, Areola (2011) states that conservation is most often associated with creation of National Parks and games reserves and protection of wildlife; the main aim of governments being the lucrative tourism industries. As a result of this, conservation mostly led to the creation and establishment of protected areas with access restriction to the forest dwellers (Dixon & Sherman, 1991). This resulted in the door to a sustainable livelihood being shut against the people whose survival depended on access to forest resources and their ecosystem services. There is little doubt that this consequently led to conflict situations, especially where people did not have alternative resources and furthermore, the conservation intentions were rarely achieved (Lewis, 1996).

In the quest for improvements to conservation results, researchers started to highlight the benefits that humans derive from their environment. In the 1990s, Constanza *et al*

(1997) increased this awareness through their attempt to estimate the global value of ecosystem services. But the concept of ecosystem services became prominent in policy agenda after the Millennium Ecosystem Assessment (MA, 2005) was carried out. Since the Millennium Ecosystem Assessment, the concept of ecosystem services has become increasingly used in academia, government, non-profit, and the private and financial sectors (Fisher *et al*, 2009; de Groot *et al*, 2002; Gomez-Baggethun *et al*, 2010; Bryson, 2004).

In Africa, the ecosystems approach has been much used in South Africa although most of the research has been from outside Africa (Egoh *et al*, 2012). Although Nigeria is the most populous country in Africa and occupies a leading position amongst its peers in many respects, the ecosystems approach has yet to gain ground or usage in policy formulation (Adekola *et al*, 2015).

The knowledge and importance of this concept in achieving sustainable community development cannot be overemphasised in a country like Nigeria. Knowledge can affect attitudes and behaviors. Willock *et al* (1999) gave this illustration that - a farmer who understands that excessive use of chemicals, which are harmful to insects, may affect the population of insects needed to carry out pollination and other useful activities on his farm, will refrain from excessive use of such chemicals. Knowledge of ecosystem services can therefore influence conservation practices (Zhang *et al*, 2015). Poppenborg and Koellner (2013) in their work found that knowledge of ecosystem services influenced the choice of crops made by farmers in a South Korean watershed.

Zhang *et al* (2015) in their study of knowledge of ecosystem services in Nigerian communities found that people were aware of ecosystem services primarily because they interacted with their environment. Their study also showed that people were more aware of provisioning services and spiritual (cultural) services and less aware of regulating and supporting services.

There is a need to do more to make the people aware of the full range of ecosystem services, especially as this could help to conserve forests. Although the Nigerian

government is making some effort, much more still needs to be done. This urgency is illustrated by the work of Adekunle *et al* (2011) in South West Nigeria. In their study, they found that only 1% of respondents were aware of any government programme aimed at conserving environmental resources and the majority of the respondents said they had never participated in a government programme in their community. Ineffective government institutions were suggested as the probable reason for this as most government institutions in Nigeria are not effective; this is supported by Smith & Lenhart (1996) who stated that generally, developed countries have well developed institutions with better adaptive capacities than less developed countries.

The ecosystem services approach as a concept is increasingly being adopted in natural resource and environmental policy and decision-making (Hauck *et al*, 2013; Lamarque *et al*, 2011; TEEB, 2010). Reid *et al* (2006) described how this framework was useful in communicating the benefits derivable from good management to diverse stakeholders and further research has shown that an assessment and understanding of stakeholder knowledge of ecosystem services is necessary in formulating useful and workable policies (Hauck *et al*, 2013; Urgenson *et al*, 2013).

For this PhD, the ecosystems services framework, as described by the Millennium Ecosystem Services Assessment (MA, 2005), was used to help design the data collection instruments to determine how aware the Niger Delta people were of the ecosystem services provided by the forests there. The results of this are reported in Chapter 5 of this thesis.

2.3.3 Stakeholder analysis

A key aim of this research was to identify stakeholders of forest ecosystem services and determine the nature of their “stake”. More details on stakeholder analysis is provided in chapter 7 of this thesis.

A careful examination of the ecosystem services framework and that of the livelihoods framework suggests that many of the different components contained in both frameworks are related or linked, through a complex medium of stakeholders and

institutions. To achieve livelihoods sustainability and enhanced wellbeing, an understanding of the dynamic interplay between these components is needed. Forest ecosystems for example, provide ecosystem services, which human beings depend on for their livelihoods. Other human activities such as crude oil exploration impact on forest ecosystem services and therefore affect the livelihoods of rural dwellers. The livelihoods framework elucidates that various actors (rural dwellers, policy makers, legislators, industrialists) need to work together to achieve sustainable livelihoods and well-being. The inter-related nature of the various concepts requires an understanding of the stakeholder participation and its effect on livelihood assets and ecosystem services (Grimble and Quan, 1993; Grimble and Wellard, 1997; Jasper and Abere, 2010).

Following from the above, the stakeholder analysis/participation framework (Figure 2-3) provides an analytical approach identifying stakeholders based on their interest and influence in a particular issue or outcome, the synergies and conflicts between them, and the relationships that they have with each other (Reed *et al.*, 2009). This therefore provides a systematic method for the research to identify and appraise those stakeholders involved in the use and management of forest resources in the Niger Delta, their interest and influence, and how they could work together.

These stakeholders, depending on their levels of interest/influence, can be classified as 'subjects', 'crowd', 'key-players' or as 'context setters'. "Subjects" are the stakeholders whose interests are very high in the matter but have little or no influence over the matter; the "Crowd" refers to the stakeholders that although they are involved in the matter, have little or no interest as well as influence over the matter; the "Context setters" wield so much of influence on the subject matter but have little or no interest (they have the capability of causing serious changes to the equilibrium); and the "Key players" are the stakeholders that have high interest in the matter and at the same time high influence; their support will be a life saver to the stakeholders classified as the "Subjects" (Graves *et al.*, 2009; Bryson, 2004). The use of the stakeholder analysis and participation framework is further developed and used to construct Chapter 7 of this PhD.

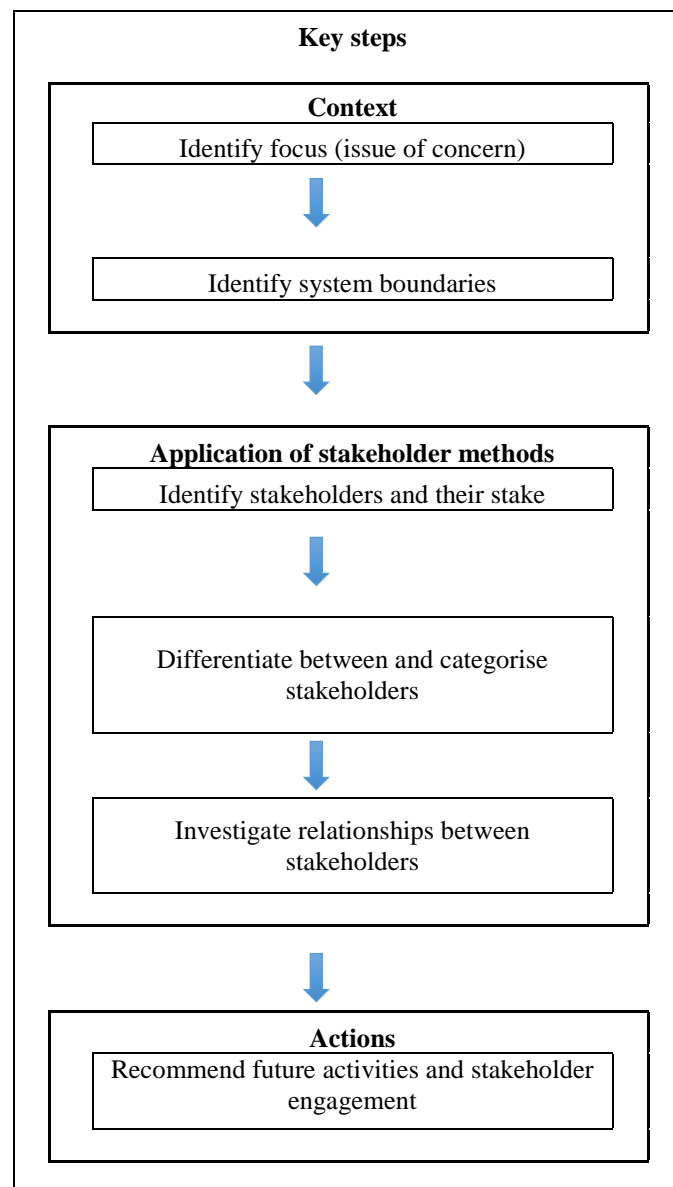


Figure 2-3. Schematic representation of the stages involved in stakeholder analysis (Developed from Reed *et al.*, 2009)

2.4 Summary

This chapter has laid out the key frameworks that were used as guide to conduct this research. The main aim was to find out how the rural dwellers are dependent on the forest resources for their livelihoods and how to make key stakeholders and the rural dwellers to collaborate towards the sustainable management of the forest resources. The frameworks are further explained in relevant sections in this thesis.

3 METHOD

This chapter explains the method used to achieve the aims and objectives of this PhD. It describes the research design, the social research approach used, the identification of study communities, the community entry strategy, and the challenges encountered, among other topics. Some terms are used in this and in later chapters of this thesis e.g. respondents and participants. Quizlet (2018) separated these terms as follows: respondents answers, responds or replies to questionnaires and this is usually in a quantitative research while participants answers questions in a qualitative study e.g. during interviews and focus group discussions; they contribute more and are more active than respondents in a survey would do because qualitative studies are more in-depth than quantitative and participants generally will give more details than respondents would do. The use of these terms in this thesis therefore refers to those from whom information or data were collected from, depending on whether it was through the use of the questionnaires or face-to-face semi-structured interviews.

The strategies used in achieving the objectives of this research can be grouped into three broad phases:

Phase 1: Desk study and planning phase. The aim of this phase was to obtain basic information to help plan the actual field activities. It consisted a review of literature and consultations with key informants (from the Niger Delta). This phase was particularly important, given the challenges of conducting development research. Murray & Overton (2014) classified these challenges to include: (a) terrain and culture, which could be unfamiliar to the researcher (b) language problems and communication (c) lack of opportunity in revisiting field sites to fill in gaps in collected data once primary field data has been collected (d) the distance from the supervisors (during fieldwork) causing challenges in limited piloting and communication (e) the influence of the “philosophical and methodological baggage” of the foreign institution and of the supervisors. These five challenges from Murray & Overton (2014) meant that proper and adequate planning before embarking on fieldwork activities was necessary.

During this phase, the design of the strategy for primary data collection was finalised (Section 3.1.1) and a number of social data collection instruments were developed and tested. All necessary approvals including that for Research Ethics (Borovnik et al, 2014; Banks & Schevens, 2014; Laws et al, 2013) were obtained; this was done through the Cranfield University *Science & Engineering Research Ethics Committee* (SEREC), which needs to screen and approve all research and engineering projects before they start.

This phase paved the way and gave direction to how the fieldwork was eventually conducted. The planning envisaged that there might be need for modifications in some cases as might be occasioned by field realities.

Phase 2: The fieldwork and data collection phase. The first part of the fieldwork phase involved making initial contacts with the selected communities and people to be interviewed in the Niger Delta. This involved explaining to them the broad aim of the research and then obtaining informed and signed consent for their participation in the research. The second part of this phase then involved the collection of primary data, using the instruments that had been developed during the Desk study and planning phase (Phase 1). The detailed fieldwork was conducted between June 2013 and December 2014 in Bayelsa State, Niger-Delta, Nigeria. The data collected during this phase of the research were recorded using written notes, voice recorders, and video files. More details and descriptions of this phase is given later in this chapter (section 3.2).

Phase 3. The data analysis. This includes how the data that emanated from the research were analyzed and presented; more details of data analysis is presented later in section 3.3

3.1 Phase 1: Planning the research (research design, purpose and strategy)

3.1.1 Research design

A research design “is a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically” (Kumar, 2005). To obtain a successful research design, Robson (2002) suggests linking purpose (i.e. what does the research aim to achieve?); theory (i.e. what frameworks guides the research?); research questions (i.e. questions to provide satisfactory answers to the purpose of the study); methods (i.e. data collection techniques / analysis to yield reliable conclusions), and sampling strategy (i.e. where is the data coming from?).

In social research, there are two broad methods of reasoning or approaches that can be adopted: deductive and inductive (Burney, 2008; Bryman, 1998, 2012). These approaches are referred to as, “fixed” and “flexible” designs respectively by Robson (2002). The deductive approach moves from the general (theory) to the specific or field research. This, according to Burney (2008) is sometimes referred to as the “top-down” method. But the inductive approach moves from the specific (field research) to the general or theory (Burney, 2008; Bryman, 2012) and it is referred to as “bottom-up”. In other words, the deductive approach moves from theory to field observation while the inductive approach moves from field observation to theory. The deductive approach is associated with quantitative methods while the inductive approach is associated with qualitative methods (Burney, 2008; Bryman, 2012). Thus, according to Laws et al (2013), while quantitative research deals with numerical data, for example, how many people might share a particular view; qualitative research deals with narrative data, for example, what people think and feel and why.

In practice, social science research often includes both quantitative and qualitative approaches in order to maximize the benefits of collecting both types of data. This is referred to as the mixed-method approach (Bryman, 2012; Jick, 1979; Denzin, 2012). In support of this, Robson (2002) states that “real world researchers may need to be somewhat innovative in their approach, not automatically following research traditions when they do not fit the purposes and context of the research task”. This mixed-method

approach is what Campbell and Fiske (1959) referred to as “convergent methodology or multi-method/multi-trait” and as “convergent validation or triangulation” by Webb *et al* (1966). These researchers share the view that the two approaches should be viewed as complementing each other rather than as rivals. Jick (1979) states that many textbooks support the mixed methods approach because of the strengths and weaknesses observed in single method designs. Jick (1979) traced the use of mixed methods or triangulation in social research to Campbell and Fiske (1959). Also, it has been argued that using only one method has the tendency to lead to a lack of academic vision and development and may generate research that is narrow and one-dimensional (Monieson, 1981).

For these reasons, in this research, data were collected using a combination of structured questionnaire and semi-structured interviews (Bryman, 2012; Corbin and Strauss, 2008); these yielded both quantitative and qualitative data. [Further explanations for this choice are provided in sections 3.1.3 and 3.2.7.](#)

3.1.2 Purpose of the research

This section describes the classification of this research based on what the research was set out to achieve. A research project, based on its objectives and what it was seeking to achieve, could be described as “exploratory, descriptive, or explanatory” (Robson, 2002). It is also possible for it to be a combination of any of the three categories (Robson, 2002; Neuman, 2003). These purposes were described using other words as “to understand, develop or discover” by Marshal and Rossman (2006) and according to Neuman (2003), they can be described as “exploring a new topic, describing a social phenomenon or explaining why something occurs”. The definitions of these classifications according to Robson (2002); Neuman (2003) and Marshal & Rossman (2006) are:

- Exploratory: assessing phenomena in new light; identifying or discovering important categories of meaning; generating and focusing ideas and propositions for future research;
- Descriptive: documenting a causal process or mechanism; reporting on the background or context or a situation;

- Explanatory: seeks an explanation of a situation or problem in the form of a causal relationships; identifying relationships between aspects of a phenomenon; testing a theory's predictions or principle and extending this to new issues or topics; supporting or refuting an explanation or prediction.

With reference to the above definitions, this PhD was exploratory, descriptive and explanatory in its purpose, as it aimed to explore and describe people's relationship to the forest and also to explain how and why that relationship existed on the understanding and awareness of ecosystem services in the Niger Delta.

3.1.3 Research strategy

This describes the road map or plan of action adopted in execution of this research (Marshall and Rossman, 2006). The strategy adopted could be any of five (or a combination) as explained by Yin (1994); they are: experiments, surveys, archival analysis, histories, or case studies. [The aim of the research often determines the choice of strategy that will be adopted. For this research therefore, the survey, archival analysis and case study strategies were adopted, as these were considered to be the most suitable for exploratory / descriptive research i.e. aimed at getting first hand and current information from the stakeholders themselves](#) (Bryman, 1988; Neuman, 1997; McIntyre, 2005).

The research used a combination of semi-structured interviews, direct observations, and questionnaires ([Overton & Diermen, 2014](#)) to collect data. At the preliminary (desk research) stages, forest stakeholders to be interviewed were identified, their locations in forest reserves ascertained, and an approach on how the interview was to be conducted was developed. An assessment of formal and informal institutions controlling access rights and governance to forest resources and ecosystem services was undertaken using an analysis of government policy documents and field data collected during field visits to rural communities. Oil exploration companies, government agencies in charge of forest resources management, non-governmental organizations involved in environmental management, individual researchers and communities were interviewed using semi-structured face-to-face interviews. A stakeholder forum through which

stakeholders developed knowledge of their rights under formal and informal law, as well as their roles and responsibilities in sustainably managing the forest resources of the Niger Delta was also organized. This forum acted as a platform from which shared solutions to forest resources management was developed, respecting the rights of all stakeholders, but particularly the rights of vulnerable and marginalized stakeholders, to benefit from ecosystem service streams.

The research relied on deductive and inductive methods to data collection and analysis. In other words, some aspects of this research were conducted using the deductive approach while some other aspects were conducted using the inductive approach. The three guiding frameworks described in Sections 2.3.1, 2.3.2 and 2.3.3 were used to help frame the methods for data collection and analysis.

3.2 Phase 2: Field activities and data collection

3.2.1 SEREC screening and approval

Prior to the commencement of field activities, approval needed to be secured for the intended fieldwork implementation from the Cranfield University's Ethics Committee, SEREC. This was important because the research involved collecting personal data from third parties and would involve the use of interviews with respondents in a potentially dangerous (high-risk) environment. The approval process from SEREC involved a thorough analysis of what the research was intended to achieve as well as its strategy of implementation. Standard forms (like questionnaire) were obtained from SEREC and were completed and submitted for screening and approval. This process ensured that the researcher developed a coherent strategy of how to inform respondents (and participants) in the research about the objectives of the research, what was being expected of them, securing their consent to participate in the research, explaining that their freedom to withdraw from the research was guaranteed, and also that all data would be anonymized and kept confidential (Borovnik et al, 2014; Banks & Schevens, 2014; Laws et al, 2013). It was after the approval from SEREC was obtained that the actual fieldwork commenced.

Safety and security issues for the researcher were also appraised during a Risk Assessment, and a strategy to ensure safety during fieldwork was developed and presented for approval. Travel in the Niger Delta to rural communities is challenging, and often involves river journeys using artisanal craft. Partly because of the remoteness of some of the selected rural communities, and partly because of the danger of such travel, this process led to a reduction in the total number of rural communities to be visited for data collection from ten to three altogether.

3.2.2 Identification of case study locations and communities

Literature and information gathered from key informants in the Niger Delta during the desk study phase helped in the eventual selection of the study locations. Initially, a range of locations was selected, including very remote and inaccessible areas, so that the specific issues for communities in these isolated areas could also be investigated. But through discussion with key informants familiar with the area, it became apparent that logistical considerations should constrain the number of locations to be researched, given the remoteness of the selected communities, the risk associated with travelling to these communities using only small artisanal river boats, and the danger of kidnapping by Niger Delta gangs.

In this respect, it is expedient to provide a brief general background information of the study area. The Niger Delta region, because of crude oil production, is at present politically defined to include all nine crude oil producing States in Nigeria (Figure 3-2). But in geographic terms, Anderson & Peek (2002) stated “the delta of the Niger River extends about 450 km eastwards from Benin River estuary on the West and terminates at the mouth of the Imo River in the East” (Figure 3-1). By this definition, the geographic (true) Niger Delta is confined to only three states - Delta, Bayelsa and Rivers States. This area is estimated to be about 70,000 km² “consisting of barrier islands, estuaries, mangroves, creeks and freshwater swamps” (Obot, 2006). Some researchers (Omeje, 2013; Asuni, 2009) refer to these three States as ‘Core Niger Delta’.

Bayelsa State was chosen in the Niger Delta as the case study state. It was selected because of its centrality; Alagoa (1999) referred to it as “Central Niger Delta”. Other reasons included the presence of government constituted forest reservation areas (there are six of them) and the presence of different types of forest cover found in other parts of the Niger Delta (mangrove swamp forests, fresh water swamp forests and pockets of rain forests). Given the challenges and risks involved in research and travel in the Niger Delta areas, Bayelsa provided [easier and safer access to all the environmental and socio-economic dimensions that would be needed to provide answers to the research objectives](#) (Laws et al, 2013).

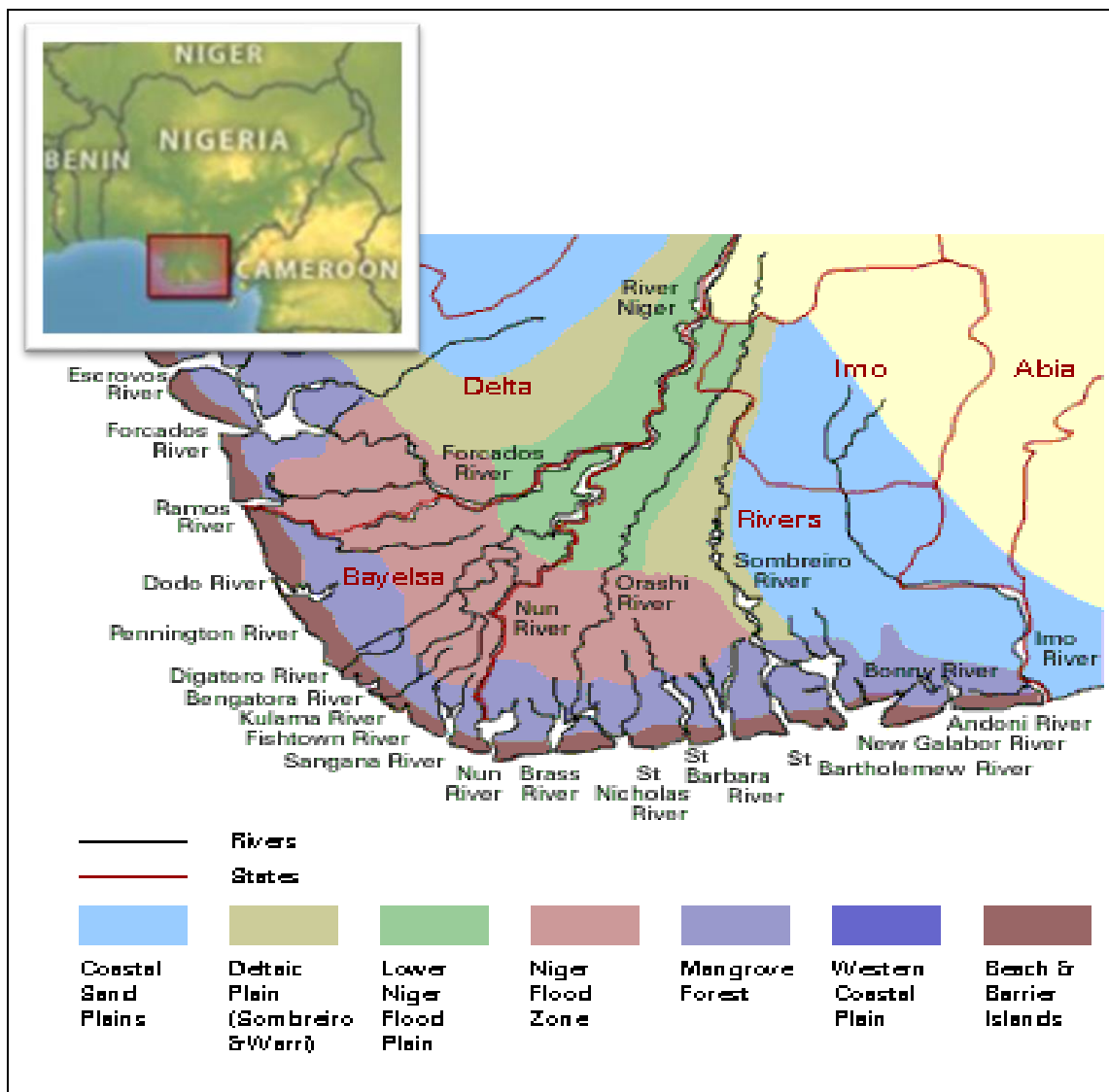


Figure 3-1. Geographic Niger-Delta (Ezenwaka, 2002)

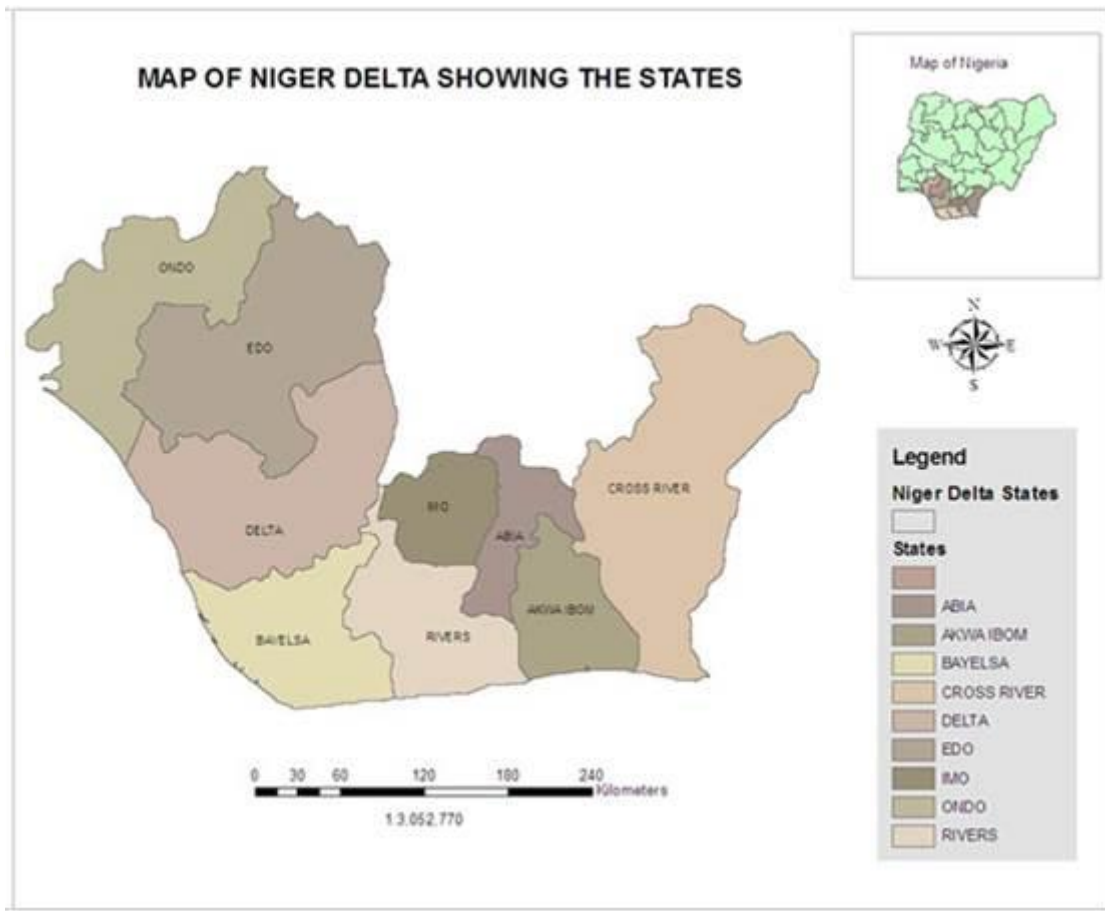


Figure 3-2. Niger Delta as defined by the NDDC Act (Nwankwo and Ogagarue, 2012)

The field data were collected from two rural communities and one urban center in Bayelsa State. The initial proposal had 10 rural communities but this was reduced to two after a careful analysis of the safety and security issues in the region at the time of this fieldwork. The rural communities were Akpide and Akipelai while the urban community was Yenagoa, which consists of several adjoining communities being the Capital city of the State. The selected communities are shown in Table 3.1 and Figure 3-3. A key objective of the research was to engage communities specifically within reserve forests to identify potential conflicts that might exist with state implemented forest conservation policy. However, there was no map available on the location of government forest reserves and Figure 3-3 had to be constructed from first principles using spatial data reference points taken from the Bayelsa State Forestry Department dossiers. Many visits to the Forest Department had to be made to obtain these data and

the necessary permissions to use them. Within the Figure 3-3, government designated forest reserves are shown in green areas while the three study communities are shown in red rings. Two of the three study communities are located within government forest reserves. Akipelai (in Ogbia Local Government Area, LGA) is situated in the Edumanom forest reserve and has both mangrove and fresh water swamp forest types. Akpide (in Yenagoa LGA) is situated in the Taylor Creek forest reserve and has both fresh water swamp and Tropical Rain forest ecosystems. Yenagoa, although an urban centre, still has Tropical Rain Forest and Fresh Water Swamp Forest ecosystems and it is not situated within any forest reservation area.

The communities were selected using a number of criteria; a purposive sampling method (Summer & Tribe, 2008; Laws et al, 2013; Bryman, 2004) was used instead of random sampling which is commonly used (reasons for adopting this sampling method is further provided in section 3.2.6). Normal random sampling could not be used here for a number of reasons. For example, a key criterion was to select communities that lay within the major types of forest cover in Bayelsa State (Tropical Rainforest, Mangrove Swamp Forest and Fresh Water Swamp Forest). No map existed of these forest covers; therefore a classification was developed using a map of Bayelsa state and with the assistance of officers at the Bayelsa State Department of Forestry. Many communities are extremely remote and difficult to get to, requiring long journeys by boat along the Niger Delta Rivers. For logistic reasons, community selection was also governed by a pragmatic need for access from the capital, Yenagoa. Population size and ruralness was another selection factor. The research considered small-sized communities with no more than 3000 people (using the statistics provided by the 1996 growth projection of the 1991 Census (NPC, 1991)). Location within or outside a constituted forest reserve was also considered. Since safety was of high priority, absence of intra and inter-community conflicts was another major factor. And very importantly, the willingness of the community to participate in the study was considered (this was ascertained during the introductory visits to the communities).

Table 3.1. Selected communities in Bayelsa State for field study

S/N	Community	LGA	Forest type	Forest Reserve
1	Akipelai	Ogbia	Mangrove and fresh water swamp	Edumanom
2	Akpide (Biseni)	Yenagoa	Tropical rainforest and fresh water swamp	Taylor Creek
3	Yenagoa	Yenagoa	Fresh water swamp & tropical rain forest	None

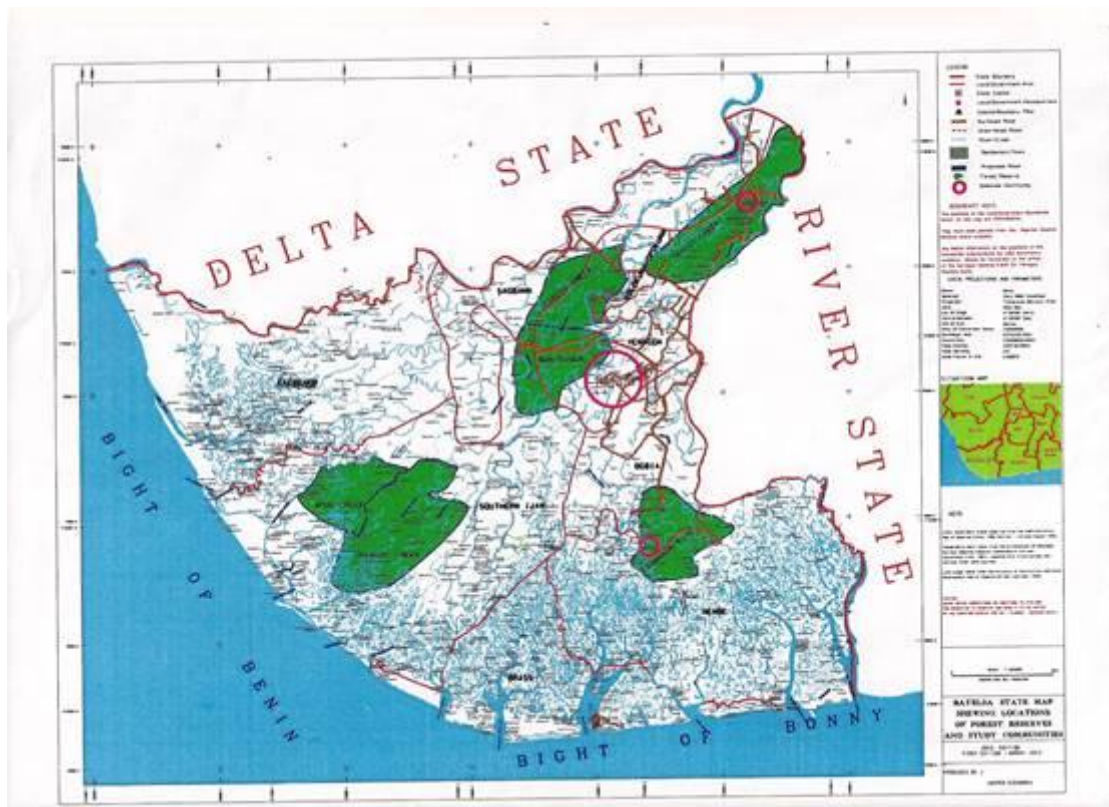


Figure 3-3. Map of Bayelsa showing the location of government forest reserves and the location of the study communities (Ezenwaka, 2014)

3.2.3 Establishment of contact with the selected communities

Borovnik et al (2014) recommend that contact should be established as early as possible with the intended community. Borovnik et al (2014) further listed mediators through

which this could be achieved; these include the village head, NGOs working in the area, other researchers who may have worked in that community, and government agencies. Other options suggested by Borovnik et al (2014) included personal visits, telephone contacts, or writing of introduction letters.

For this research, initial contacts were made through personal visits and the writing of introduction letters to the communities, agencies, and persons that were identified to be part of the research. The personal visits and introduction letters introduced the aim of the research and outlined what was expected from the participants, should they agree to be involved in the research. The responsibility of confidentiality of personal data and voluntary consent in the research was also explained. Telephone calls and personal visits were employed thereafter as a follow up to the initial visits and introduction letters, to build confidence and a rapport with the participants, particularly in the rural communities, and also to start the process of gaining data. To gain the confidence and rapport of some participants, several visits had to be made to them.

As noted previously, the Niger Delta is a volatile area, and for that reason, a key ethical commitment was to anonymise all the data, and ensure that no individual who contributed to the research could be linked to any of the data during its collection, storage, and publication. This commitment also facilitated trust and confidence and helped with recruitment of respondents, participants, and key informants.

3.2.4 Community entry strategy

The desk study was used to obtain background information about the communities. For each of the study communities, a native of that community who resided in the city (Yenagoa) was identified (through the help of staff of the Forestry Department and key informants in Yenagoa) and was used as a link (link-person). This provided a lead into the communities (Laws et al, 2013). A letter of introduction (Borovnik et al, 2014) was thereafter written to the community to explain the purpose of the study and to pre-inform them of what type of questions would be asked in terms of the area of interest of the researcher. The first visit to the community was to the chief of the community and members of the Community Development Committee. In this visit, the aim of the study

was discussed and questions were answered which enabled the community to clarify doubts. A key aim of these visits was to develop trust since, given all the difficulties that the Niger Delta has experienced, and continues to experience, forest dwellers are often suspicious of individuals from outside their own communities. Once trust had been developed, subsequent visits were to conduct the interviews with the community stakeholders.

Also, during the early visits to the communities, a research assistant (McLennan et al, 2014) from each of the study communities was identified and was engaged as a community facilitator. The use of the community facilitator was essential. They knew who the farmers, fishers, and loggers were and where and how to locate them. The community facilitator facilitated the meetings with the target interviewees and their presence also enhanced the cooperation of the interviewees. They also acted as interpreters as several different languages are spoken in the Niger Delta. However, care was taken to ensure that the community facilitators did not influence, edit, or censor what was being said (Laws et al, 2013). Time was taken to explain the purpose of the research to the community facilitator and all the interview notes were reviewed with the community facilitator after the interviews. Opportunities were specifically taken throughout the fieldwork to also interview participants that the community facilitator did not know, by identifying other participants ad hoc during the several visits made to the communities. During the interviews, the questions would be asked several times in different ways to confirm that the responses of the participant were the same in a process that Laws et al (2013) refer to as “triangulation”.

Figure 3-4 and Figure 3-5 shows the community facilitator for each of the rural communities.



Figure 3-4. Rogers Isowe, the community facilitator (left) in Akpide community (with the researcher, right)



Figure 3-5. Patrick Matthew, community facilitator in Akipelai community

3.2.5 Use of the stakeholder, sustainable livelihoods, and ecosystem services framework

Figure 3-6 is a diagrammatic representation of how the three guiding frameworks (already explained in Chapter 2 of this thesis) were used to direct the research and provide answers to the research objectives. They are also further discussed in chapters 4, 5, 6 and 7 as is relevant to each chapter.

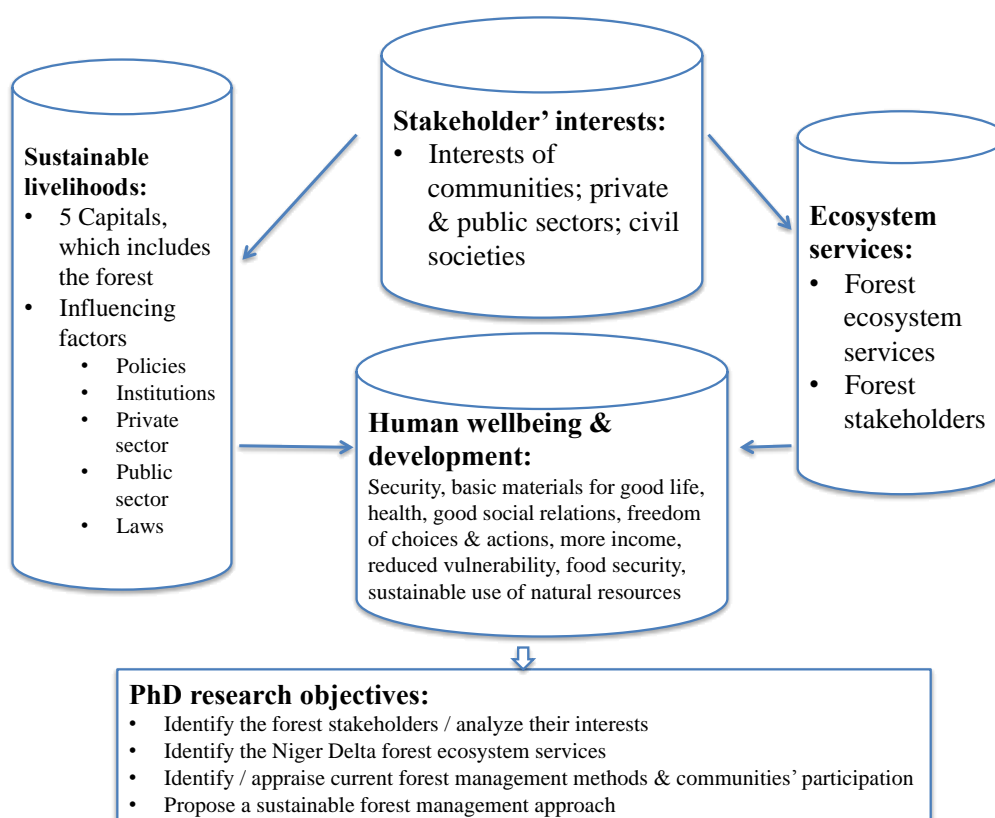


Figure 3-6. Diagrammatic representation of how the guiding frameworks have been used

Human-wellbeing is the central aim of each of the identified frameworks. The end-point of the *sustainable livelihood* framework is achievement of human-wellbeing; this is the same as the end-point of the *ecosystem services* framework. But the *stakeholder* concept links them both since it recognises that stakeholders have *fundamental interests* that must be satisfied in order to achieve human wellbeing goals. These fundamental interests are linked to survival and wellbeing i.e. sustainable livelihoods, but also to the critical role that ecosystems play in this through the provision of ecosystem services.

Figure 3-6 brings these frameworks together as a representation of stakeholder interests and the achievement of human wellbeing and development through sustainable livelihoods and the effective delivery of ecosystem services. This summarises and synthesises the analysis of the three guiding frameworks for this research undertaken in Chapter 2. Through this framework, the research more specifically aims to identify fundamental stakeholder interests in the ecosystem services of the Niger Delta forests because of the importance of these interests in the achievement of human wellbeing and development. In this respect, the research aims to contribute to knowledge of how the forests of the Niger Delta can be better managed to ensure a sustainable livelihood for those that depend on it for survival.

The synthesis of the frameworks (as shown in Figure 3-6) informed what data were to be collected and how to collect such data (Marshall & Rossman, 2006; Miles & Huberman, 1994).

3.2.6 Difficulties faced during community interviews

The Niger Delta is a risky place to conduct research due to the unrest of the youth and various groups agitating for control of the resources of the region, leading often to kidnapping and hostage taking for ransom. Given this general background and unrest, communities and individuals were often reluctant to involve themselves in the research. However, the nature of the frameworks used, including as they did such concepts as the achievement of human wellbeing and development proved to be topics of research that the forest dwellers were prepared to engage with, and facilitated the process of building trust and confidence amongst the communities.

Difficulties encountered during the community interviews included the language barrier (Murray & Overton, 2014). Most of the rural dwellers were not formally educated and not many could understand or speak English. The explanation of some key concepts or words was particularly challenging. The open-ended nature of the interview questions was another challenge. The participants would sometimes deviate from the main focus of the interview or give answers that were not related to the question.

This challenge was expected and was properly handled. The strategies employed to ease this language challenge and enhance the accuracy of the data included the use of unambiguous words, asking the same question in different ways (triangulation), the use of the 'pidgin English', a version of English language widely spoken in Nigeria and understood even by those not formally educated and, the use of interpreters, which here were also the community facilitators. Also, whenever respondents deviated from the focus of the interview, the questions were asked again in a different way to bring the respondent back to the question. Jargon and technical terms can be confusing and intimidating to participants (Laws et al, 2013). These were therefore avoided during the interviews as familiar words were used and the interviews were made as simple as possible. Body language i.e. non-verbal signals (Laws et al 2013) of the respondents were observed to determine if the participants were confused or had understood the questions.

Another challenge was the selection of the sample from which data was generated for this research. Lack of time and or resources often constrain research and this is the reason why a sample is chosen to represent the entire population (Overton & Diermen, 2014). This research was greatly constrained by lack of time and resources (e.g. finance, baseline literature materials and absence of data to work with) as well as safety concerns. Basic data that take a matter of minutes to access in most European countries are extremely difficult to track down in Nigeria. Accurate and reliable data on population are not available in the Niger Delta. There are no telephone directories and houses are not properly numbered. This is a common feature in Bayelsa State and it is worsened by the absence of distinct streets in most places. Houses are built in a clustered pattern, sometimes difficult for vehicles to access. This situation makes it difficult to take census data to characterize the population and to determine, for example, what sample size should be used and how it should be stratified.

When information on the population is not available, this results in collection of data from a non-representative sample. When this happens, Overton & Diermen (2014) recommend the following non-representative sampling methods: (i) convenience sampling i.e. participants are chosen because they are conveniently available; (ii)

snowball sampling (also known as chain sampling) i.e. from the first participant identify the next participant that fits the criteria required for the interview; (iii) purposive sampling, where the researcher decides who to include in the sample, for example, by specifically choosing a community because it has a particular health issue the researcher is researching; (iv) quota sampling, i.e. where a specified number of people of a particular social grouping is selected

This research made use of the purposive sampling method (Overton & Diermen, 2014; Summer & Tribe, 2008; Bryman, 2004). According to Overton & Diermen (2014), Summer & Tribe (2008), Bryman (2004) and Laws et al (2013), this is more appropriate in qualitative research. As noted above, the choice of the sample depends on the purpose of the research. Research in a development context usually explores issues that are not well understood and in situations where a reliable sampling frame cannot be defined. In these situations, purposive sampling is often used (Overton & Diermen 2014; Summer & Tribe 2008; Bryman 2004; and Laws et al 2013). In these exploratory situations, research often aims to identify what views are held about specific issues, rather than to identify how many people hold those views (Laws et al, 2013).

In the communities, the participants were chosen based on occupation (such as farmers, fishers, loggers, and hunters). The possible occupational groups had been previously identified through the literatures and interviews with key informants. The interviews with the participants were conducted up to the point that the new interviews stopped yielding new information that had not been collected from previous participants (Stewart-Withers et al, 2014).

For the urban respondents in Yenagoa, ability to self-complete the questionnaire was required; a self filled questionnaire was more convenient for these people because of their often busy schedules; it was more convenient for the respondents to take the questionnaire for self-completion and return it on a later date. Also for these set of persons, the purposive sampling method was used. Bayelsa State is among the least educated states in Nigeria and it is classified as one of several educationally disadvantaged states by the Nigerian government. As a result of this, the questionnaires

were distributed in areas where educated people could be easily found i.e. the State Secretariat and other educational institutions within the Yenagoa metropolis (Laws et al, 2013).

3.2.7 Development of data collection instruments

A detailed justification of the techniques and tools used has been provided in sections 3.1.1 - 3.1.3, which dealt with the research strategy. In this section, further details of how the tools were developed and used are provided.

A structured self-administered questionnaire (Table 3.2) was used to collect quantitative data from urban dwellers since it was considered that this would be adequate to provide a baseline by which to determine whether urban dwellers consider that forests were important for the same reasons as rural dwellers (more of this process is explained in section 5.2.2). However, face-to-face semi-structured interviews were used to collect data in the rural communities, where rural respondents were often not literate, and would have not been able to respond to a self-administered questionnaire. Semi-structured interviews were also used during the interviews with the private sector, government and other stakeholders. In both cases, semi-structured interviews were considered to be the most appropriate data collection tool, since it was important to capture the richness and complexity of rural narratives and the depth of knowledge of key informants. In both cases, the semi-structured interviews also provided a means of capturing the respondents' own words in response to the questions asked (Rubin and Rubin, 1995; Laws et al, 2013). A discussion on the inherent weakness / strength of this technique is provided in section 3.5 of this chapter.

The MA's ecosystem services framework was adapted for use for the collection of field data on knowledge of ecosystem services. Table 3.2 shows the adapted framework. The questionnaires were distributed to the urban respondents within the capital metropolis of Yenagoa in Bayelsa State while the same questionnaire was used as a checklist for semi-structured interviews with the rural participants (because most of them could not read or write).

The questionnaires were retrieved from the urban respondents and the results collated. In the rural areas, the response of the interviewees was noted against each question as the semi-structured interviews proceeded; the results were also then collated.

Table 3.2: Questionnaire on knowledge of ecosystem services

S/N	QUESTION	EXAMPLES	ANSWER (Yes / No)
1	Do you know that the forest provides the following goods?	Food	
		Fresh water	
		Wood	
		Fiber	
2	Do you enjoy these values or aspects of the forest?	Fuel	
		Aesthetics / Beauty	
		Spiritual / psychological	
		Educational	
3	Do you know that the forest has a regulating function on:	Recreational / relaxation	
		Climate	
		Flood	
		Disease	
4	Do you know that the forest supports	Water purification	
		Nutrient cycling	
		Soil formation	
5	From the above functions of the forest, what is the most valued forest resource or function to you?	Primary production (food chain)	
		Please, write your answer to the following question in the right hand column	

Community-level interviews:

At community level, the objectives were to: identify benefits derived from the forest (ecosystem services); identify conflicts and current threats to the natural resources /

ecosystem services; identify alternative natural resources conservation methods; and identify incentives, which encourages resource conservation.

The above objectives were achieved following the steps below:

- a. Identification of ecosystem services: the Millennium Ecosystem Assessment template was adapted and used as a guide to gather the information (Table 3.2).
- b. Identification of level of abundance and degree of threat of ecosystem service:
 - The levels of abundance or scarcity of and threat to each identified ecosystem service was appraised by the participants.
 - The source of the threat and or reason for abundance was also asked during the semi-structured interviews.
- c. Ranking and prioritization of importance of ecosystem services: this was also captured within Table 3.2.

Checklist of other questions for semi-structured interviews:

An interview schedule was used as a guide for the semi-structured interviews (on other issues not already covered in the questionnaire on ecosystem services). These questions were mostly open-ended so that the participants could expand their explanations using their own narratives. Again, in many instances, the questions had to be asked in various ways, to ensure that the participants had understood their meaning, after which an in-depth discussion would be used to explore the question in detail. This allowed the participants to focus on those issues of most importance to them, and help to prevent researcher bias.

a. Community:

The issues of interest included: types of natural resources available to the community; what specific benefits the people derive from the forest; the abundance or scarcity of such named resources and if there are alternative sources; access to / control of natural resources / tenure systems; efficacy of local conservation laws and government imposed laws; possibility of collaboration with other stakeholders for purposes of better

management of the natural resources; interface with external stakeholders. Typically, the questions included the followings (but largely dependent on previous answers):

- What is your occupation?
- Do you have other source(s) of employment or income?
- So, like what percentage of your household income comes from the forest?
- What will you say is the average level of dependence of your community people on the forest resources?
- Which of the benefits from the forest do you consider the best to you?
- In respect of availability of the forest resources, will you say they are still abundant, declining or threatened?
- Any reasons for this?
- What are the benefits you can mention?
- Do you have any alternative sources for these benefits?
- Is the Akpide (Biseni) forest part of a government forest reserve?
- So, you are able to enter any part of your forest at any time and harvest or collect anything you want?
- Can anybody enter any part of your forest and harvest anything as they want?
- Do women own lands here?
- But are there any community or native laws that protect certain environmental goods or services?
- Can you name some of those lakes that are protected by native laws?
- How effective is this native law?
- Are you aware of any government effort aimed at conserving this forest?
- But will this community be willing to collaborate with other stakeholders for the purposes of managing your forest resources?
- Do you sell lands to non-natives?

b. Government (Forestry Department):

The issues of interest included: the approach adopted in setting up conservation areas i.e. Bottom up or Top-down (Britha, 1995); what laws govern the conservation areas; what provisions are made for host communities in the conservation areas; what has been

the nature of conflicts (if any) in the conservation areas; lessons learnt; possibility for collaborative site management with other stakeholders. The questions that were asked included:

- What types of lands or forests are constituted into a forest reserve?
- What is the procedure?
- What laws govern the conservation areas?
- What provisions are there for the host communities?
- Has there been any kind of conflicts and what have been the main causes?
- Any lessons learnt?
- What informed the constitution of the Taylor Creek and Edumanom forests as reserves?
- What have been the major challenges in managing these reserves?
- What is the benefit of the recent upgrade of these reserves into the status of a National Park?
- Do you think that a participatory management approach will yield better results? I mean a process whereby host communities and other relevant stakeholders are involved.

c. Oil exploration companies:

The issues of interest include: efforts aimed at conserving the natural environment; approach for handling communities' requests and impact of exploration activities on the livelihoods of the host communities. The following questions were asked:

- I am interested in knowing:
 - SPDC's efforts aimed at conserving the natural environment;
 - Approach for handling communities' requests;
 - Impact of exploration activities on the livelihoods of the host communities
- How is this (the GMoU) managed? I mean is there a structure?
- Will you say this has yielded results? Reduced conflict situations?
- What about the natural environment, is it taken care of under this arrangement?
- Are you able to know if this is considered as a priority by the clusters?

- How inclusive is this GMoU? I mean how much are people carried along in decision-making and implementation?
- Can the CTs and CDBs partner with other stakeholders for purposes of bringing improvements to the livelihoods of the people?

e. Others (Academics, NGOs):

Issues of interest included their experiences in natural resource management issues in the Niger Delta. The following questions were asked the NGOs that are assisting in the management of the GMoU:

- You are one of the Mentoring NGOs for the Shell GMoU, will you say that this model has been a success?
- The 6th principle of the GMoU talks about environmental sustainability and conservation, have community people been able to include their natural environment in any of their plans? I mean, to plan for the conservation of natural resources e.g. forests?
- So communities have not consciously planned for the conservation of the forests but more on needed infrastructures?
- Why has the communities not been including the natural assets e.g. forests in their projects planning?
- Do you think that this situation can change or will change with time?
- Can you provide me with a little background to this GMoU thing?
- Any gains?
- What of on the part of SPDC?
- How well has it done on partnerships?
- Any challenges?

3.2.8 Data collection for this research

The constraints for data collection as well as sample and sample size have been explained in Section 3.2.6; the reasons for selection of the specific data collection instruments have been described in Sections 3.2.6 and 3.2.7. A total of 115 respondents were interviewed in Nigeria between 2013 and 2015 in order to conduct this research. Table 3.3 shows a breakdown of the respondents according to stakeholder groups.

Whilst 96 persons provided data for the research during one-to-one interviews/questionnaires, 19 participants provided data during the stakeholder workshop (See Section 3.2.9). These participants/respondents were made up of five categories of respondents: the “rural communities”, the “urban dwellers”, the “government”, the “oil companies” and, “others” (academics, civil society organisations, non-government organisations, and individual researchers).

Table 3.3: Number of respondents/participants (per stakeholder group)

S/N	Stakeholder group	Number of people (Interviews)	Number of people (Stakeholder forum)
1	Rural communities (2 X 25)	50	6
2	Oil companies (SPDC ¹)	1	0
3	Urban dwellers	40	0
4	Government	3	6
5	Others (CSOs)	2	3
6	Academia	0	3
7	Legislature	0	1
	Total	96	19

¹SPDC = Shell Petroleum Development Company

The “government” stakeholder group is responsible for policy making and implementation of policies. In this regard, the Forestry Department of the Bayelsa State Ministry of Environment was selected. For the “oil exploration companies”, the choice was made to select those working within the catchment of the chosen communities for this study. In this case, this included the Shell Petroleum Development Company of Nigeria (SPDC). Academics from the Niger Delta University, some individual researchers within the region and other non-governmental organizations constituted the category of “others”. The “rural communities” were Akipelai and Akpide while the “urban respondents” referred to those within the Yenagoa urban metropolis. The stakeholder forum is not considered as a category because it comprised people drawn from all the other five categories of respondents.

The fieldwork and data collection commenced with the rural communities, followed by that of the urban dwellers, and ended with the stakeholder forum. The interviews with other stakeholder groups (government, NGOs, academics, oil companies) were done according to the availability of the target participants. While the questionnaires were

distributed within the Yenagoa urban metropolis to the urban respondents, and did not target any particular strata of society or type of stakeholder, the face-to-face semi-structured interviews, which were conducted with other categories of [participants](#), followed a process. In each of the two rural communities, 25 people were interviewed representing various community stakeholder groups, such as the council of chiefs, community development committees, farmers, fishers, traders, hunters, artisans, women and youth ([basis for this has been explained in 3.2.6](#)). For the government [participants](#), officers of the rank of directors were interviewed (being the heads of the department). Non-government organisations involved in environmental issues were identified and their chief executive officers interviewed (in some of these instances, the CEO directed the officers directly in charge of such issues to respond). For the oil exploration companies, being a mega private corporation, the head of the Yenagoa field office was interviewed. Self-completion questionnaires (Robson, 2002; Bryman, 2004) were used to collect data from the urban respondents and these yielded mostly quantitative data. Seventy-five questionnaires were distributed within the Yenagoa metropolis. From this number, 52 were retrieved but only 40 were properly completed and usable.

A checklist of questions were developed and used as a guide for the semi-structured interviews ([Stewart-Withers et al, 2014](#)). These questions were open-ended; this allowed the participants to clarify issues and explain their points by using their own preferred words in their responses ([Laws et al, 2013](#)). This method helped to reveal the points that were of paramount importance to the participants (many of which were not anticipated during the planning phase of the research).

Interviews with particular categories of [respondents/participants](#) had objectives or themes. The themes of the interviews varied depending on the interviewee. For the community, interviews revolved around the types of forest resources available to the community, what specific benefits the people derived from the forest (ecosystem services), the abundance or scarcity of such named resources and if there were alternative sources of the resources (sustainability issues), access to forests, control of forests, tenure systems for forest land, (forest resource conflicts), efficacy of local conservation laws and government imposed laws (forest management policies), the

possibility of collaboration with other stakeholders for purposes of better management of the forests (building synergies and partnerships), and the interface with external stakeholders (linkages for sustainable development).

The focus of the interviews with the forestry department was on the approach adopted in setting up conservation areas, whether “bottom up” or “top-down” (Britha, 1995), what laws govern the conservation areas, what provisions were made for host communities in the conservation areas, what had been the nature of conflicts (if any) in the conservation areas, lessons learnt and possibility for collaborative site management with other stakeholders.

For the oil exploration companies, the focus was on their efforts to conserving the natural environment, their approach for handling communities’ requests, and the impacts of exploration activities on the livelihoods of the host communities.

For the category of “others”, the interviews were focused more on the elicitation of their experiences in forest resource management issues in the Niger Delta.

3.2.9 The stakeholder forum

Introduction and objective:

This forum was held on the 4 December 2014 in Yenagoa, in order to make the identified forest stakeholders in the Niger Delta interact and discuss their interests with each other, with a view to finding a way forward towards the sustainable management of the Niger Delta forest ecosystems. The convening of this forum was a major achievement of this research. The stakeholders had been previously identified through discussions with key players in the sector and in the region. Through literature and as the field interviews progressed, it had become evident that stakeholders were acting independently of each other while the dwindling of the forest ecosystem was affecting them all as stakeholders. There was no synergy or interaction. As a result of this research, this stakeholder workshop represents the very first time that forest

stakeholders have met to discuss issues affecting the sustainability of the Niger Delta forest ecosystem.

The process of convening the meeting:

The process of bringing the stakeholders together involved initially procuring funding for the workshop venue, the hire of video recording equipment to collect the data, and the travel and subsistence costs of the stakeholders for the workshop. In this respect, and after many letters, telephone calls and personal visits, a commitment to provide the funds (for the hall) was eventually secured from an oil exploration company in 2015. Once funding had been secured, the next stage involved the writing and dispatch of introduction and invitation letters to the stakeholders, which thoroughly explained the nature, and purpose of the workshop. These letters were used to solicit the participation of the stakeholders. This was then followed by personal visits and telephone calls to each invitee, to further explain the purpose of the workshop and clarify any issues and questions from the stakeholders. These visits and telephone calls were used to build trust and secure commitment for the workshop and the willingness of the stakeholders to participate in it.

Attendance:

All invited stakeholder groups were represented at the workshop except for the oil exploration companies, who apologised that they could not attend. There were a total of 19 people in attendance. This number was comprised of three people from the academia, three civil society organizations, six people from government, one person from the legislature, and six people representing two rural communities. Thirty two percent of the attendees were female.

Data collection:

The entire workshop process was recorded using a video recorder that had been hired specifically for the workshop (a copy of the video is submitted for reference). During the workshop, stakeholders were asked to speak into a microphone to aid the process of data capture by the video. This produced 3 hours of video footage and a data file that was 27.49 GB in size. After the workshop, the sound track of the video recording was

analysed using a laptop computer and headphones. Due to external sound interference in places, the sound track was sometimes difficult to follow, in which case, careful and repeated examination of the visual footage and the soundtrack together was used to determine the narrative of the stakeholders. Using this process, a summary of the stakeholder workshop was then written out in note form (9.3Appendix A).

Activities and outcomes:

The workshop was used to discuss a range of issues relating to forest resources utilization and management in the Niger Delta Region. An activity plan was sent to the stakeholders with the introduction and invitation letters and was used to guide the workshop. This is shown in Table 3.4 and discussed in more detail below. Figure 3-7 and Figure 3-8 shows stakeholders, responding, debating, and listening to each other during the stakeholder meeting.



Figure 3-7: cross section of participants during the stakeholder meeting



Figure 3-8: researcher is making a presentation during the stakeholder meeting

The activity plan Table 3.4 of the workshop comprised in a series of activities that were used to create confidence and a relaxed, non-threatening atmosphere to ensure that stakeholders would be willing to share their experiences and opinions without fear.

Table 3.4. Activities during the Niger Delta forest stakeholder workshop

S/N	Activity	Objective	Person responsible	Time
1	Welcome and Opening session	Breaking the ice and setting the objectives for the meeting	Jasper	9.00am
2	Introduction of the PhD research details and results from field interviews	To raise main issues emanating from the field interviews which should form the basis for the forum discussions	Jasper	9.15am
3	Experience sharing	To hear experiences of other people	All	9.45am
Tea-Break				10.15am
4	Plenary discussion of issues arising from the presentation(s)	To take decisions and strategize on way(s) forward	Jasper	10.40am
Lunch Break				12.40pm
5	Communiqué	To summarize the agreements reached in this workshop	Rapporteurs	1.40pm
6	Appreciation / Closing		Jasper	2.00pm

Welcome and opening session

The purpose of this session was to welcome the participants, make them comfortable with each other and also to introduce the purpose for the workshop.

The participants were asked to introduce themselves one at a time, in plenary. The objective of the meeting as well as the activities for the day was then explained. The objective of the forum was to discuss the issues of forest ecosystem benefits and its sustainable management.

Introduction of the PhD research details and results from field interviews

The purpose of this session was to present the objectives of the PhD research, explain the methods adopted to achieve the objectives, and outline the main issues emanating from the field interviews, which were then used as discussion points during the forum's discussions. This session was also an opportunity for the stakeholders to listen and respond to the methods adopted as well as main findings from the field interviews, for example, on whether based on their own experience, they agreed or disagreed with the issues and concerns raised regarding the Niger Delta forests.

At the end of the presentation, the forum was asked to react to the main issues highlighted as well as on the adequacy and suitability of the methods used. The forum agreed that the issues raised were well represented and that the method was adequate. However, the forum identified the need for spatial data to show changes in forest cover in the region over the long-term.

The issues raised during this session were then used to guide the discussion sessions that took place after the tea break.

Experience sharing

The aim of this session was to learn from the experiences of other persons. A number of people shared their experiences and comments were taken from the floor. The Bayelsa State Ministry of Forestry and Environment, Shareholders Alliance for Corporate Accountability, SACA, and a few other individuals shared their experiences in environmental and forest protection activities.

Plenary discussion of issues arising from the presentations

From the presentations, a number of themes emerged for further discussions. These issues were discussed in plenary, and the themes and conclusions (outcomes) have been used in relevant sections of this thesis, for example in Table 6.1, Table 7.1 and Table 7.3. Additionally, the forum was used to triangulate what had been extracted from the field interviews and interviews with key informants.

The final decision on every issue that was discussed during the workshop was reached through a general consensus in the plenary session. Issues were debated and opinions discussed, but the final decision was always taken in the plenary session. The final decision of the forum was then taken to be the outcome or response of the stakeholder forum for each topic that was discussed during this workshop.

The data from this stakeholder forum was then used in combination with the data collected from the field interviews and key informant interviews to contribute to the development of the results chapters of this PhD.

3.3 Data collation, analysis and presentation

During the community interviews and face-to-face interviews with key informants, data were recorded or taken by using written notes when the recording device failed. The data for the urban communities where a self-administered data collection tool was used, was in effect recorded by the respondents themselves and then transferred to an Excel spreadsheet for quantitative analysis.

In the case of qualitative analysis, Laws et al (2013) suggest that collation and analysis of data can start from the point at which it is collected in the field and that the analysis of qualitative data involves continual reflection on the data that have been collected in order to make meaning. Here, the organizing of the material as well as the identification of themes, was initiated right from the initial stages of data collection, although these initial structures and themes were continuously revised as necessary. A certain level of analysis was done during the interviews, for instance, by asking the questions differently to check that the participants understanding of what was being said was accurate, or for example, by checking one person's responses or views against another's, and asking for explanations where people's views diverged. At the end of each interview, a summary of what had been said was quickly made, in what was essentially an early part of the analysis. Notes were also made during the interviews (with consent of the interviewee).

Analysis of qualitative data should be a description of what was found during the research and the researcher's personal views should not be allowed to interpret this in any way (Laws et al, 2013). Laws et al (2013) suggest that asking other researchers to assist in the analysis can be useful to ensure objectivity and because it can also enrich the analysis.

The checklist developed during the desk study phase became a guide to an initial classification of themes, linked to the livelihoods and ecosystems framework. New and emerging themes were then recorded as the analysis of the qualitative data progressed. In this way, the analysis was based on what was said rather than quantification of the number of people who said the same thing (Laws et al, 2013).

The process of analysing the data was highly iterative. It involved familiarization with the data through reading and re-reading of the field notes, sometimes several times, to check for correct interpretation of the data and new themes. A list was made of emerging themes of the data and was supported by the initial checklist of potential themes that had been developed through the literature review of the desk phase. This was straightforward as the interview checklist became very relevant also at this phase.

The thematic content (qualitative) analysis was undertaken manually although this can also be done using specific software designed for this purpose, such as Computer-assisted qualitative data analysis software, CAQDAS e.g. NVivo 8 (formerly NUD*IST) and HyperRESEARCH. This software can be good, but comes with added cost and time to learn it; it is more useful when data is voluminous (Laws et al, 2013).

Here, the quantitative data from the self-administered self-completion questionnaires given to the urban respondents were collated in a Microsoft Excel spreadsheet and were analysed to obtain descriptive statistical information such as frequency distributions.

The narrative data collected during the community and key informant interviews were recorded in a summary transcript (Appendix B) and then analysed using thematic content analysis (Corbin and Strauss, 2008; Taylor-Powell and Renner, 2003) to

develop understanding of how urban and rural dwellers interacted with and benefitted from the forest. The outputs are shown in relevant ways in the result chapters. Texts are presented (italicized) in many places as exact quotes from the semi-structured interviews to explain the real feelings of the respondents (Denzin and Lincoln, 2008).

Themes from the semi-structured community and key informant interviews represented particular topics of interest to which this research sought answers to during the field survey. To arrive at a conclusion on any particular theme, all responses in connection to that particular theme were collated to identify agreements and disagreements (Taylor-Powell and Renner, 2003). This process involved a repeated examination of the transcripts, that is, the typed-out raw data from each interview. Texts and whole sentences were quoted or extracted in some cases, especially those that portrayed the general outcome for that particular theme (Denzin and Lincoln, 2008). Quotes are italicized wherever they appear.

The Rural Economy and Land Use (RELU) stakeholder analysis tool (Graves *et al.*, 2014) was used to analyse stakeholder interest, influence, and communication. This output was used to develop chapter seven of this PhD. The results from the analysis of livelihoods and ecosystem services were analysed, presented and discussed in line with the respective frameworks.

3.4 Gender and educational level of respondents

Although this research was not focused on gender, specific effort was made to interview women (Scheyvens *et al.*, 2014) while in the communities to ensure that their responses as forest resource users would be captured by the research.

Table 3.5 is a characterization of the urban and rural respondents according to gender and educational attainment. An average of 38% of the rural respondents were females (36% in Akpide and 40% in Akipelai), while it was 48% in the urban centre. In terms of educational attainment, the urban respondents were more and better educated than the rural respondents. While 65% of the urban respondents had first degrees and another 25% had higher degrees (i.e. 90% had university education), there were none that had a

university education in the rural areas. The highest educational attainment among the rural respondents (12% from Akpide and 16% from Akipelai) was a respondent with college level education. This level of education is higher than a high school but lower than university, and also includes technical or vocational education meant to develop intermediate skills. The modal class (highest frequency) for educational attainment of the rural respondents (44% from each of the two rural communities) was high (secondary) school. In contrast, this was the lowest for the urban respondents (10%). While as high as 40% from Akpide and 36% from Akipelai had only a primary education, the remaining 4% (from both communities) had no education at all. This educational disparity (between the rural and urban respondents) may have an effect on their awareness and preferences of ecosystem services.

Table 3.5. Gender and educational level of rural and urban respondents

Category of respondents	Gender (%)		Level of education (%)					
	M	F	None	Primary	Secondary	College	1st degree	Higher degree
Rural:								
Akpide-Biseni (n=25)	64	36	4	40	44	12	0	0
Akipelai-Ogbia (n=25)	60	40	4	36	44	16	0	0
Urban (n=40)	52	48	0	0	10	0	65	25



Figure 3-9. One of the interview sessions at Akpide

3.5 Shortcomings of this methodology

The reason for the small sample size has been fully discussed and justified above (3.2.6), and is consistent with, the research approach taken, which was qualitative in nature. This research could have benefitted from an increase in the number of communities and respondents involved, but this was not possible here, given the logistical constraints and time constraints of the project (Overton & Diermen, 2014).

The strength and weakness of qualitative research is often in terms of the human element i.e. the researcher. This, according to Stewart-Withers et al (2014) is because the quality of the outcome of the research is dependent on the quality of the researcher conducting the research. This challenge was dealt with during this research because the researcher has extensive experience in qualitative researches and the challenges that this presents. A key aspect of this research is willingness to listen and learn from the participants, and to report and represent their narratives accurately. In this respect,

extensive use has been made of quotes that represent the actual words that the participants used, so that their original meaning is clear.

Another challenge in social research is that of “positionality and reflexivity” (Stewart-Withers et al, 2014; Laws et al, 2013;) i.e. the researcher’s own influence on aspects of the study, for example, in terms of what types of data have been collected and in how they may have been interpreted. To address this issue, only a guiding checklist was initially developed to guide the interview process and to ensure that no important issue (in relation to the main research objective) were omitted. Otherwise, questions were largely open-ended and follow-on questions were dependent on the participants’ previous answers. These answers were recorded and used in the final analysis without further alterations.

Although funding for this research was principally from the Nigerian Government, this did not have any influence on any aspect of the work. Therefore, there was no conflict of interest exerted by the “funders” of the research (Banks & Scheyvens, 2014). The choice of which communities to work with was driven entirely by the needs of the research topic and a range of logistical considerations, whilst the choice of the topic of research itself, has been entirely the choice of the researcher. And at no time, was any pressure brought to bear on the research in any way by any outside agency for any of the research findings to be analysed or interpreted in any particular way.

4 SUSTAINABILITY OF LIVELIHOODS IN THE NIGER DELTA COMMUNITIES

This chapter discusses the livelihoods of the Niger Delta people. The sustainable livelihoods framework and the ecosystems framework (see Chapter 2) are used together as an analytical framework (see Chapter 3) to systematically identify the threats and opportunities for rural people in the Niger Delta forest in order to determine how their livelihoods can be improved. Data from the community interviews and the stakeholder forum contributed to the development of this chapter.

4.1 Introduction and background

The Niger Delta is home to about 20 million people (NPC, 1991). A majority of the dwellers, especially the rural dwellers, survive through natural resources found in their environment (LENF, 1998; Allison-Oguru, 2006). The challenges facing resource poor people in the rural areas are complex and multi-dimensional; understanding such challenges therefore requires integrated analysis (Morse *et al*, 2009). The sustainable livelihood framework (Figure 2-1) has provided a means of understanding how the lives of rural dwellers are vulnerable to shocks and drivers of change (Ezenwaka, 2002; Carney 1998; DfID 1999) and *is used as an analytical framework in this chapter*.

The sustainable livelihoods framework, *discussed in detail in Chapter 2, proposes* that sustainable livelihoods are dependent on a number of livelihood assets, which include:

- i. Natural assets e.g. naturally occurring assets like the forests
- ii. Physical assets e.g. infrastructure such as markets, road networks and social amenities
- iii. Human assets e.g. knowledge and skills
- iv. Financial assets e.g. income base of the people
- v. Social assets e.g. social networks or associations which people belong

All the five livelihood assets are seen as crucial to an individual's livelihood and particularly in the long-term, effective access to these assets is important for that livelihood to remain sustainable. These assets are a form of *capital* to the people.

Bourdieu (1986) described capital as, “an accumulated labour that can be appropriated by individuals or groups for their exclusive use to further their interests and increase their capital holdings or chances of survival”. From this perspective, the sustainable management of forests as natural capital is an important component in securing the livelihoods of the people for the future, particularly as forests also support the provision of other forms of capitals. For example, forest products are harvested and sold (producing money; financial capital); the money is used to create physical infrastructure such as markets and roads (physical capital); the various forest based associations and networks such as farmers group, palm tappers group, hunters group, are forms of social capitals; the various skills adapted as related to the extraction and use of the forest resources are forms of human capital. The entire life of the Niger Delta rural dweller revolves around the forest resources (LENF 1998).

The aim of this Chapter is to describe the livelihoods of the Niger Delta people and [propose how these could be made more sustainable in order to improve human well-being and development.](#)

4.2 Method

The method used to achieve the objective in this chapter is already described in more detail in Chapter three of this thesis; only a brief description is therefore provided here. The semi-structured interviews with the rural dwellers, questionnaires from the urban dwellers as well as the stakeholder forum provided data for this chapter. Some additional data were collected in the form of observational field notes and photographs taken during travel in the case study areas.

A review of literature and policy was used to develop an analytical framework for identifying the key challenges and providing possible solutions to the management of Niger Delta forest resources. The sustainable livelihoods framework (Carney, 1998; DfID, 1999) and the ecosystem framework (MA, 2005) were used together ([see Chapter 3](#)) to identify how forest resources benefitted local communities.

4.3 Results and discussions

In this chapter, the results are presented as themes that emerged from the data analysis and are discussed simultaneously (there is no separate discussion section). This is common in qualitative research and has been done in order to facilitate critical analysis of the data that are based on the narratives associated with the community interviews (Appendix B) and the stakeholder forum (Appendix A).

4.3.1 Sources of livelihoods and dependence on natural capital

The occupation or sources of livelihoods of the urban and rural respondents is shown in Table 4.1. In contrast to the livelihoods of urban respondents, the livelihoods of rural participants was highly dependent on the ecosystem goods and services provided by natural capital, and dominated by farming, fishing and trading; this is in conformity with Usman *et al* (2016), Adekunle *et al* (2011) and Okunola (2011). In rural areas of the Niger Delta, there are little or no opportunities for white-collar jobs. Most, if not all of the government and private sector establishments are urban located. The range of potential occupations described by participants underlined their dependency on the ecosystem goods and services from the forest and the lack of alternative subsistence and income earning opportunities. Lewis (1996) explained that the presence of alternative occupations is critical if conflict situations are to be avoided in conservation areas and natural resource programmes. This is because alternatives can remove or reduce pressure that is exerted on single sources of livelihood, which in this case is the forest.

This result suggests that the native rural dwellers were highly dependent on ecosystem services for their livelihoods. This result is similar to those of other researchers e.g. Dhyani and Dhyani (2016), Swallow *et al* (2007), Angelson & Wunder (2003), WorldBank (2000), Anderson *et al* (2006), Arnold & Townson (1998), Kaimowitz (2003), CIFOR (2005), Shackleton & Schackleton (2004), Vedeld *et al* (2007) and Bryon & Arnold (1997). There were little or no alternatives. This dependency could be part of the reason why both the urban and rural respondents stated that the forest resources have declined in production and in some cases, are threatened or already extinct (see Table 6.2).

Table 4.1. Occupational categories of respondents

Rural participants (n=50)	%	Urban respondents (n=40)	%
Farming (25)	50	Academia (3)	7.5
Fishing (12)	24	Civil Service (24)	60
Civil Service (1)	2	Legal service (2)	5
Trading (15)	30	Student (6)	15
Hunting (6)	12	Banking (1)	2.5
Crafts making (2)	4	Medical Doctor (1)	2.5
Unemployed (5)	10	Pharmacist (1)	2.5
Logging (5)	10	Self-employed (2)	5
Palm cutting (2)	4		

In Table 4.1 above, the types of occupations mentioned by the 50 rural and 40 urban respondents are as listed above. There are nine occupation types under the rural participants and eight under the urban respondents. Farming was mentioned 25 times, indicating that approximately 50% of the rural sample engage in farming; fishing was mentioned 12 times, which implies that approximately 24% of the rural sample engage in fishing; civil service was mentioned only once, which implies that 2% of the urban sample are in civil service. The total frequency of the occupations under the rural participants is 73 and not 50 (unlike as under the urban respondents, where the frequency for the occupation types equals the number of the respondents e.g. 40). The explanation is that the rural people do more than one occupation at a time in order to earn a living (see Box 4.1).

The rural participants depended almost entirely on environmental resources for their livelihoods, unlike the city dwellers. The depth of this dependency on NTFPs was reflected in the narratives obtained during the face-to-face interviews. This outlined consumption particularly of non-timber forest products for personal and family consumption, the possibility of generating income from such products, and the potential to use materials from the forest to create tools to pursue other livelihood options and income earning opportunities.

For example, one rural participant said, ‘there is no person here that does not take something from the forest either for sale or for home consumption’ (Participant 13). Another said, ‘Ogbono (*Irvingea* spp) and snails, they fetch a lot of income and also serve as food for the family’ (Participant 2). A third participant said, ‘most of what I sell are still from the farm or forest e.g. Ogbono, snails, cassava (Participant 3); apart from farming, some people engage in fishing, hunting, collection of some forest products, weaving of fishing traps, baskets’ (Participant 7). Some other relevant quotes to this theme are shown in Box 4.1.

The findings here shows that the livelihoods of the rural participants (see Table 4.1), are mostly forest-based, a theme that is supported by previous peer-reviewed literature. The most frequently identified livelihoods (farming, fishing, and trading) all depend on the forest. In the work of Usman *et al* (2016), only 4.8% of the participants were engaged in other works not dependent on the forest, reflecting the findings produced in this thesis. Farming is largely based on shifting cultivation, relying on forest secondary growth for nutrients and the replenishment of soil fertility. Fishing relies on the rivers and it has been clearly established that the regulation of water quality and the supply of water to the rivers are critical ecosystem services of the forest (Lu *et al*, 2001; Trimble & Lull, 1956; Peterjohn *et al*, 1984), and most of the fishing gears are gained from the forest e.g. rattan and bamboo. The goods of the traders were also likely to be derived from the environment, mostly NTFPs, such as bush meat, gum, honey, leaves, snails, ogbono fruits (*Irvingea* spp), palm wine, woven articles, brooms, fishing gears, timber, fuel wood, palm oil, fish, herb, farm produce and planting materials.

The less frequently identified activities were also forest-based, such as hunting, collection of NTFPs, crafts making, lumbering, wine tapping and palm cutting. All their livelihood activities revolve around their environmental resources. Despite the seeming variety of occupations in the rural community, participants did not specialize in these occupations, but often used several of these activities to secure their livelihoods. One participant stated that rural dwellers did ‘bits of every other thing’ (Participant 38), such as farming, hunting, fishing, lumbering, wine tapping in order to secure their livelihoods. This, according to Participant 38, was related to the seasons (there are two

seasons in Nigeria: rainy and dry seasons; most of the lands in the Niger Delta are seasonally flooded during the rains). **Participants** noted that NTFPs formed a great part of their source of daily income. Some quotes from the rural dwellers in relation to this are shown in Box 4.1.

Box 4.1: Sources of livelihoods and dependence on ecosystem services

- *There is no person here that does not take something from the forest either for sale or for home consumption (Participant 13)*
- *Ogbono (*Irvingea gabonensis*) and snails; they fetch a lot of income and also serve as food for the family (Participant 2)*
- *Most of what I sell are still from the farm or forest e.g. Ogbono, snails, cassava (Participant 3)*
- *Apart from farming, some people engage in fishing, hunting, collection of some forest products, weaving of fishing traps, baskets, etc (Participant 7)*
- *What we do is determined by the season: we do not farm during the floods; we fish. Ogbono fruits do not fall all year round; it is seasonal. So, when the floodwaters have receded, we do active farming. When it is time to fish in our lakes, you will hardly find so many people around; most of us will be in the fishing camps (for weeks). Participant 7*

4.3.2 Alternative sources of livelihood

The presence of alternative sources of livelihood assets is vital to the wellbeing of the people (Carney, 1998). In this respect, government policies become very important, at least in the provision of alternatives for the people. As has been discussed above, there appear to be no alternatives to natural capital for the rural Niger Delta dwellers.

The forest (and other environmental resources) was also the major source of alternative livelihood incomes. They stated *we are basically farmers and fishermen (Participant 1); we do not have access to government or private sector employment (Participant 2); all we use comes from the forest (Participant 26)*. There were no other sources of employment in the rural communities; most of the government and private sector establishments were located in urban areas.

Neither were there alternatives to the benefits they derived from their environment. The lack of alternatives, according to Lewis (1996) has implications (i.e. non-cooperation of

the locals, hostilities, poaching) for schemes aimed at conserving these environmental resources; these issues listed by Lewis (1996) were also the case in Akpide and Akipelai communities. The interview result showed that most of the things rural people depended on for survival was ultimately dependent on their environment: food, materials for construction and production of hunting and fishing gear. In order to obtain money they would sell some of these products and use the money raised to buy other items that were not locally produced, such as roofing sheets, salt and farming implements. **Box 4.2** shows some quotes from the people in this regard.

Sections 4.3.1 and 4.3.2 shows how important, natural capital is to the Niger Delta people. Although the crude oil, for which the region is well known, is of great value to the government (seeing that it contributes over 80% of government's foreign income), the reality is that the people, from whose ground the crude oil is extracted, do not derive so much value from it but from the forest resources. In direct contrast to this, the forest is of little worth to the government; an entire ecosystem can be brought down just for the prospect of getting crude oil. This is a common feature in the Niger Delta where an entire community is relocated (e.g. Finima in Rivers State) and their ancestral land taken over by the government because of oil or gas extraction activities. The major cause of degradation and loss of biodiversity (local extinction of some plants e.g. *amasi*) in the region is attributed to oil exploration activities. The participants believe that the beginning of gradual loss of agricultural and other naturally occurring resources in their forests was when oil exploration activities started around their communities (See Section 4.3.3). This was mentioned in Biseni and also in Akipelai. Unfortunately, the government and its agencies have done little (if anything at all) to alleviate this problem where sources of livelihoods are lost.

Box 4.2: Alternative sources of livelihood

- *We are basically farmers and fishermen in this community (Participant 1).*
- *We do not have access to government or private sector employment here, so I will say that we depend almost entirely on our environmental resources (Participant 2)*
- *All we use comes from the forest (Participant 26)*

4.3.3 Availability of forest resources

The forest resources were viewed to be in constant decline, with some species threatened or already locally extinct. Nzeh *et al* (2015) in a work that was carried out in Eastern Nigeria confirmed that the forests are under pressures from various human activities. The rural participants stated: *these days, all the forest resources are seriously declining (Participant 1); they are reducing in quality, quantity and size (Participant 3); we used to have elephants but they are no more (Participants 5 & 22)*. An example of an already extinct crop was *amasi (Colocasia species)*; a staple food crop in Akipelai community, which became extinct in 2011. The rural participants confirmed that other crops were seriously declining in production as well. It was stated by both rural communities that the forest resources are declining as a result of *oil exploration* activities. Participants stated that it had become more difficult to obtain forest resources. They claimed: *we put in more effort to get a sizable quantity compared to time past (Participant 17)*. Also, the prices of the commodities had gone up and had affected the cost of living. In their words, *life is becoming more difficult (Participant 26); they have become more expensive (Participant 30); we pay more for less (Participant 44)*. They felt they had become *poorer* and more vulnerable to *diseases* as well (Participant 32).

The continued loss of natural capital implies a negative impact on the livelihoods of the people who depend on them. The added problem is that the rural people do not have all it takes to reverse this trend alone. The stakeholder forum had suggested government legislation to protect the forests i.e. a legislation that restricts or prescribes how oil extraction should be carried out around forest areas.

Box 4.3 shows quotes from the Participants, showing how they feel about the continued decline in availability of their much-needed natural capital. This result from the rural communities supports the works of Okojie (2007) who reported that tropical forests are being degraded at an unsustainable rate. The UN (2002) stated that many important species are now extinct in Nigeria and the FAO (2005) reports that Nigeria has the highest level of deforestation in the world.

The continued loss of natural capital implies a negative impact on the livelihoods of the people who depend on them. The added problem is that the rural people do not have all it takes to reverse this trend alone. The stakeholder forum had suggested government

legislation to protect the forests i.e. a legislation that restricts or prescribes how oil extraction should be carried out around forest areas.

Box 4.3. Availability of forest resources

- *These days, all the forest resources are seriously declining. They are even threatened (Participant 1)*
- *They are reducing in quality, quantity and size. We do not get them as we used to get them a few years ago (Participant 3)*
- *We used to have elephants but they are no more (Participants 5 & 22).*
- *They are becoming more scarce but then, we get more money because their prices are also going up (Participant 15)*
- *We put in more effort to get a sizeable quantity (compared with time past) (Participant 17)*
- *We now resort to buying some of them from the market. Some are so scarce (Participant 21)*
- *Life is becoming more difficult because of these changes (low productivity of environmental goods) (Participant 26)*
- *Amasi is now extinct (a variety of cocoyam and a staple food of the people). It became extinct in the year 2011. Plantain (another economic crop) is also reducing very much in production (Participant 29).*
- *Amasi was a delicacy here (we eat and sell it) (Participant 30)*
- *They have become more expensive in the market (Participant 30).*
- *We pay more for less quantity now (Participant 44)*
- *The price of food has increased. Poverty is increasing. Disease is more frequent (Participant 44).*

4.3.4 Reasons for the decline of natural capital (forest resources)

This became an important topic during the interviews with the rural [Participants](#) and urban [Respondents](#), and was also discussed during the stakeholder forum. It became important when almost all the respondents were affirming that natural capital is so important to livelihoods of the people but that it was in a constant decline; threatened or even extinct in some cases.

There are many factors that influence continued availability of natural capital (Carney, 1998; DfID, 1999): (1) Natural shock events can make people vulnerable. Some

examples according to Carney (1998) include storms, floods, climate change, and even changes in seasons (e.g. dry seasons characterized by lack of access to water). These events are outside the control of the people. Evidence collected during this thesis demonstrated that there have been changes in availability of some forest resources (e.g. the extinction of *amasi*) due to changes in environmental conditions; (2) Institutional and governance factors such as government policy (e.g. forest conservation policies, see section 6.3.1), private sector policy (e.g. the SPDC's GMoU, see section 6.3.3), culture, institutions, and property rights. A favorable government policy can help to reduce the effect of other identified vulnerability factors but in the Niger Delta, government policies are poorly implemented (see section 6.4.2).

These vulnerability factors influence the livelihood strategies of rural people, shaping the options and survival strategies that are available to them. The success or otherwise of the livelihood strategy affects the livelihood outcome. Successful interventions increases livelihood sustainability and wellbeing, building resilience to shocks, trends and seasonality, so that vulnerability is reduced.

Furthermore, the Niger Delta Environmental Survey, (NDES, 1997) identified a number of threats to the sustainable provision of forest ecosystem services in the Niger Delta. These threats were categorized into three major groups as follows: (a) natural / environmental: including coastal and riverbank erosion, flooding, subsidence, sedimentation, and siltation. During the fieldwork, this issue was not mentioned by the Participants; (b) developmental / human: including urbanization, land degradation, soil fertility loss, agricultural decline, loss of vegetation (especially non-timber forest products) and habitat for wildlife, biodiversity depletion especially fisheries decline, and pollution from industrial activities. These issues were mentioned during the interviews in the communities. The Participants mentioned increased population as a reason for increased pressure on forest resources (this is discussed later in this section of the thesis); (c) socio-economic: including poverty, unemployment, and communal conflict resulting in loss of lives and property, displacement of people, and loss of sources of livelihood. The rural Participants mentioned unemployment as reason for loss of biodiversity.

Of key importance in reducing the resilience and sustainability of local community livelihoods in the Niger Delta is the degradation of the Niger Delta forests; as has been discussed earlier, the forests play a key role in rural livelihoods in the area. The consequences of this degradation has been:

- i) Biodiversity loss: biodiversity is being depleted rapidly by hunting, uncontrolled logging, poorly conceived construction / developmental projects (Figure 4-1a, and Figure 4-1b), oil and gas exploitation and urbanization (LENF, 1998). Furthermore, federal, state and local governments and their agencies have limited capacity and support to conserve biodiversity in designated protected areas and other priority sites for conservation (result from the stakeholder workshop). It is a source of great concern that some parts of the Nigerian tropical rainforest have been degraded to savannah-like vegetation (here referred to as man-made or derived savannah) and in some other places, to a dominant vegetation of palm bushes / trees (Figure 4-2a) because most other trees of economic (timber) value have been harvested without being replaced (Jasper and Abere, 2010).
- ii) Declining fisheries resources: Depletion of fish stocks as a result of over-fishing and pollution is a major constraint facing water resource. Fishing is a critical activity for local communities of riverine Nigeria (Ezenwaka, 2002; LENF, 1998). Many rural dwellers in the riverine areas depend on fishing as a means of livelihood (Figure 4-2b). Fish is a major source of income in the riverine communities (Allison-Oguru, 2006).
- iii) Invasive species: Invasive species threaten local biodiversity, on which people depend. A good example is the Nypa palm (*Nypa fruticans*), an introduced exotic species. This is one of the biggest threats to biodiversity in the Niger Delta. Together with water hyacinth *Eichornia* spp., (Figure 4-2c), another invasive plant, they block waterways, making fishing and transportation activities very difficult in rural communities (LENF, 1998).

Some quotes in support of this theme are presented in Box 4.4. Among other reasons given by the [Participants](#) for the decline and in some cases, local extinction of some forest species were:

Population growth and urban development: The rural [Participants \(1 & 19\)](#) stated variously that the *population is increasing and there is no employment; many more people are depending on the forest for survival (Participant 1)*. As population increased, more forest areas were cut down to make way for community expansion, for example, building of new houses. Increasing population in the community also meant increased pressure on the available forest resources. This is supported by findings in [Osemeobo \(1988\) who found in his work on human causes of forest depletion in Nigeria that increasing population placed more pressure on the forests, resulting in loss of forest resources.](#)

Lack of alternative sources of livelihood apart from the forest: [Participants](#) stated that: *there is no alternative source of employment so everybody resorts to what they can get from the environment (Participant 8)*. They depend almost entirely on the forest resources, resulting in the over-harvesting of the resources. It was estimated by the rural [Participants](#) that their dependence on natural capital is over 95% ([Participants 1, 4, 8, 29, 34, 40, 45](#)); this is point is supported by [Usman et al \(2016\)](#) that rural dwellers depend almost entirely on available forest resources for survival.

Unsustainable harvesting of the resources such as *picking of immature snails, hunting of immature animals, cutting down of economic fruit trees such as *Irvingia gabonensis*, use of chemicals to fish in rivers, over-harvesting of timber (Participant 43)*. This, according to [IISD \(2009\)](#) and [Dieudonne \(2001\)](#) can have negative effects on sustainable development as it will have a negative effect on future availability.

Construction work: This problem was physically observed during the field work, when a transect walk was undertaken; this is shown in [Figure 4.1a&b](#). Poor road engineering work has harmed some ecosystems (in Akipelai) through ponding e.g. a situation where the construction of a road is poorly planned and executed leading to the cutting off of a perennial stream. This resulted to water ponding, upstream; and a total lack of water, downstream. Upstream, this lead to the death of trees and other plants that could not withstand the resulting excessive water, while downstream, trees and plants

were dying because of lack of water. This situation may eventually lead to changes in the ecological composition and will definitely impact on the livelihoods of those that depend on the continuous flow of that cut-off stream and the ecology that is now destroyed.

Oil exploration activities and pollution, gas flaring, and oil spills: according to the interviews, the community people believed that this was the major cause for the declining forest resources. They believe (Participants 5, 22, 26, 34, 36, 41, 44, 46 & 50) that their *forest resources were abundant until oil prospecting and exploration activities started in their localities*. They could trace the beginning of loss of agricultural, forest and river resources to the coming in of the oil exploration companies. This is the belief of local people, and although there is limited formal scientific data to support this claim, local knowledge (Nwosu & Anwana, 2013; Anwana et al, 2010) in this case is backed up by ample reporting and circumstantial evidence.

Technology: such as *motorised sawing machines (Participant 50)* has made the harvesting of timber more efficient. This means that more trees can be felled and also more easily than how it had been previously done. *Previously, before the introduction of the motorized saws, the loggers were using local implements such as axes. With this, they are only able to fell a few trees in a year. This has therefore contributed to the fast rate of decline of the forest resources.*

Commercialisation of forest products: some forest products such as snails and *ogbono (Irvingia gabonensis)* were formerly used mainly for domestic consumption, but have become highly lucrative, thereby causing more people (in effect the entire community) to become involved in their collection. Rural participants stated that *we now sell these forest items (Participant 10) to get money (before now, we only harvest them for home consumption). So this has helped to increase the rate of harvest and cutting down of the forests; before now, men did not pick ogbono but they now do (Participant 16).*

The urge to satisfy present rather than future needs: Rural respondents felt that there was no need for conserving the resources when they have not been able to satisfy

their today's need; this confirms the work of Adekunle et al (2011). For example, Participant 32 said *'But if we convert all of our forests and creeks into forbidden places, where do we get our daily food?'* while Participant 7 put it this way *'So, will we not eat?'* The lack of alternatives is relevant to this reason. Satisfying current need was more important to the people than planning for posterity.

Noise: The rural respondents stated that *noise from vehicles and various other human activities have chased the animals far and deeper into the forests (Participants 5 & 33).* According to the Participants, before the construction of roads, there were more wildlife around the communities.

Box 4.4: Reasons for the declining forest resources

- *I think the population is increasing and there is no employment; many more people are depending on the forest for survival. Oil pollution is also destroying our lands. Our crops do not yield as much again (Participant 19).*
- *Technology is another reason (the use of sawing machine has made it easier to harvest timber). This makes the cutting down of the forest to be easier and faster (Participant 4).*
- *I think it is as a result of development and noise (motor vehicles, roads construction passing through the forests, increasing oil exploration activities and expanding urban settlements) (Participant 5)*
- *There is no alternative source of employment so everybody resort to what they can get from the environment (pressure on the resources as a result of more people having to depend on these resources) (Participant 8)*
- *We now sell these forest items to get money (before now, we only harvest for home consumption). So this has helped to increase the rate of harvest and cutting down of the forests (Participant 10)*
- *Before now, join to pick ogbono but they now do (Participant 16)*
- *Roads construction has caused so much of noise and has chased the animals far into the thicker forests (Participant 33).*

It is unfortunate that the Participants did not see how their own daily activities such as bush burning, farming, hunting immature wildlife, unsustainable felling of trees and expanding human population (Usman et al, 2016; IISD, 2009; Dieudonne, 2001 and Osemeobo, 1988) affected the availability of the forest resources; they were more

concerned with their immediate survival but despite this, they were willing to accept any intervention that would reverse the trend in forest loss.

The following photographs were taken as evidence in support of some of the issues, which have been discussed above. The effect of this on livelihoods has been discussed also above (4.3.4).



a)

b)

Figure 4-1: (a) Water ponding upstream as a result of poor road engineering work resulting in (b) the waterlogging and death of plants (Photos by Jasper Ezenwaka, 2014)

Figure 4.1a shows that water-flow has been interrupted by this roadwork, so that downstream areas are starved of water while up-stream water has been impounded. With time, this situation will result in changes in the ecological composition of the up-stream and down-stream sides of this road. This may have negative effect on livelihoods of those that depend on these resources. Figure 4.1b shows plants dying as a result of the ponding of water caused by bad road engineering works. Excessive water in the soil has expelled the soil air (oxygen), starving the roots of air for respiration thereby causing the plants to die back from the roots. This will have an effect on ecological composition and provision of ecosystem services of the area, and the livelihoods of local people.

Figure 4.2a shows a forest where all other trees of economic value have been extracted as timber, leaving only palms. The participants mentioned the introduction of motorized saws as reason for the fast rate of disappearance of the forest trees. The palms are not cut down because of its value to the rural dwellers (Participant 28 & 39). Participant 39 put it this way *'the palm tree is a highly valued tree in this community. People do not cut down palm trees except it is no longer bearing fruits. People protect the ones on their farms. We guard the sprouting ones. We are also engaging in planting of palms'*.

Figure 4.2b shows a fisherman's catch; fish is very important as a source of protein and income in rural livelihoods of the Niger Delta. The rural participants mentioned fishing as one of the dominant occupations of the people.

Figure 4.2c shows water hyacinth covering part of a river, which makes fishing and transportation difficult. This was observed during the transect walk although it was not mentioned by the participants.



a)

b)



c)

Figure 4-2: (a) Palm bush (b) A fisherman's catch (c) Water hyacinth
(Photos by Jasper Ezenwaka, 2014)

4.4 Implications on livelihoods of the people

The earlier (above) section has elucidated the threats to livelihoods of the people. In general, people depend on available livelihood assets (Carney, 1998) for survival. But the five livelihood assets mentioned by Carney (1998) are only available to the Niger Deltans in varying degrees. The availability or otherwise of the various capitals are further discussed below.

4.4.1 Natural capital

As has been discussed in earlier sections (4.3.1, 4.3.2 and 4.3.3), rural Participants relied heavily on natural capital in the form of forests and rivers, and the ecosystem services flows were perceived to provide everything for survival (see Box 4.1, Box 4.2). But these were fast declining (see sections 4.3.3 and 4.3.4). The institutional and policy framework of the government was not effective (this confirms the assertion of Chukwuone & Okorji, 2008) in helping to reduce the vulnerability of people (this is further expanded in Chapter 6). The people lacked alternatives to these natural capital benefits for their livelihood (see Box 4.2) and were vulnerable to seasons and trend (see Box 4.1).

4.4.2 Physical capital

This was severely lacking in the rural communities; visual observations showed this fact as well as the interview with Participant 55 who explained that one of the challenges to the success of the GMoU is the lack of physical assets in the communities which makes the community people to want to invest almost all the seed money on trophy infrastructures; in his words, *'the major challenge to the initiative presently is the desire of the community members to use the money from the initiative to develop trophy infrastructures such as halls and palaces; little emphasis is paid to environmental management and resource recovery to expand the community economic base'*. There were few adequate roads and people relied on the waterways for transportation of goods and humans (see section 5.4.3). These waterways were becoming blocked with water hyacinths. There was very little electricity, and no mills to process and preserve the products from the farms, rivers, and forest. This problem caused respondents to lose much income that should have accrued to them through these activities. The distance from the rural area to the urban market is great and the lack of infrastructure predisposed rural people to shocks. The SPDC's GMoU (see Section 6.3.3) was supposed to provide some form of financial capital for increasing economic opportunities in the rural communities, but because of lack of critical infrastructure, the communities preferred to use their money on developing infrastructures such as town-hall, concrete walk ways, market stalls.

4.4.3 Financial capital

Observation of living standards within the community indicated that the rural respondents were poor. It was also confirmed during the interviews that life had become more difficult as a result of increasing cost of commodities and scarcity or reduction in their harvests (see section 4.3.2, Box 4.3 and Box 4.4). Participants felt they were not getting much return from their activities. There exist no credit facilities for the people as well. Their living standard is also declining, for example, participants explained how the feeding standard had dropped; they now buy and eat iced fish, instead of the fresh river fish they were used to getting easily from their rivers. It is also this river fish that provides them with money once sold. Participant 41 said *'it is difficult to get a good catch. The fishes are no longer there. Before now, we do not buy iced fish in this*

community. But selling of iced fish is now a business here because of the lack of fish in the rivers'. Participant 46 put it this way 'they are not what we were used to having; we are beginning to adapt to the changes' and Participant 43 said 'it was not a part of our meals here before now. It's because of the scarcity of fish from the rivers (the catch is no longer enough for family and for sales). We now prefer to sell the catch from the river (it brings more money). The iced fish is cheaper for domestic consumption'. In essence, the absence of the river fish is now a drain in their income.

4.4.4 Human capital

The communities were small in population (but densely populated when viewed against the actual area being occupied). Observations revealed that quite a small percentage of the residents were within the active (productive) age range while most rural people were either children or elderly. The workforce was small largely because of lack of opportunities in the rural communities (see Box 4.2) and as such, many adults of working age had migrated to urban areas in search of work. The rural people are also less educated and not as skilled as the urban respondents. With this analysis, it can be said that they are low on human capital.

4.4.5 Social capital

From observations, the communities seemed to enjoy high levels of social capital. They often belonged to various groups and associations within the community and derived support from each other. They lived a communal lifestyle whereby certain events were jointly carried out, such as burials, marriages, and fishing in the big lakes (Participant 1). They assisted each other on their farms and during building constructions. However, they lacked external linkages. The extent of their social capital was limited mostly to the community, making them vulnerable once they were outside their community of origin.

In summary, this Section 4.4 highlights that the rural respondents had minimal access to physical and financial capital, and lower access to human capital than the urban respondents. By contrast, the rural respondents had access to natural and social capitals. However the level of natural capital is perceived to be declining as many of the resources are becoming threatened and extinct. Whilst there was strong social capital

within the group, they lacked strong external links and this is a minus to their strength on social capital; not much can be achieved in the rural communities without support from external stakeholders.

4.5 Conclusion

The livelihoods framework was found useful to the appraisal of the people's livelihoods.

Niger Delta people, especially the rural dwellers, depend almost entirely on available forest resources for survival; [this fact is supported by many previous researches e.g. Arowolo *et al*, 2014; Inoni, 2009; Adekunle *et al*, 2011; Okunola, 2011; Aruofor, 2001; Angelsen & Wunder, 2003; Shackleton & Shackleton, 2004; Vedeld *et al*, 2007; Bryon & Arnold, 1997.](#)

And these resources are in decline ([Okojie, 2007; Oyebo, 2006; FAO, 2005; Phil-Eze & Okoro, 2009; Osemeobo, 1988; Ravilious *et al*, 2010](#)). There are few or no alternatives. The forest ecosystem (environmental resources, including the rivers) is the only livelihood asset that is readily available to the people with which they can achieve their livelihood objectives. An appraisal of the policies and institutions ([see Chapter 6](#)), which is supposed to help cushion the effect of vulnerability factors, was found to be largely ineffective. In other words, the respondents were exposed to these factors and this had a negative influence on the achievement of wellbeing goals. It is important that the institutions of government make necessary changes so as to alleviate the vulnerability of rural people and at the same time ensure the achievement of their livelihood outcomes. Such measures could include a review of policies and provision of needed infrastructure as well as access to credits.

At the present, the livelihood strategy of the people is that of unsustainable harvesting of the ecosystem benefits, which has serious implications for future availability. Environmental education activities will enlighten people and may have positive impacts on the way forest resources are exploited. Provision of alternatives, in the form of

micro-credits and the establishment of other income generating micro-enterprises is also recommended.

Although this thesis is based on an interview in two rural communities and involving 50 rural participants and one urban centre with another 40 respondents, Bayelsa State is home to about two million people of which a sizable percentage lives in the rural areas. Also, the entire Niger Delta (political Niger Delta) is home to about 20 million people. The rural dwellers all over the Niger Delta are exposed to these same issues highlighted here. This underscores the relevance of the results presented in this chapter and in this thesis and that its scale of applicability can be increased.

5 ECOSYSTEM SERVICES OF THE NIGER DELTA FORESTS

This chapter describes how people in Bayelsa State depend on forest ecosystem services and attempts to assess their awareness of that dependency. This material has been published in the *Journal of Agriculture, Forestry and Social Sciences* (Vol.14/1, 2014; pp 38 - 58). The chapter is based on this paper although some sections have been modified to minimize repetition and to improve the flow of the text.

5.1 Introduction and background

Nigeria is endowed with abundant renewable and non-renewable natural resources. Oil and gas accounts for 95% of Nigeria's export earnings and 80% of the total annual income of Nigeria (Darah, 2001). Over the years this has become the cause of many conflicts in the Niger Delta region of Nigeria.

The Niger Delta area is also rich in forest resources that are important in the livelihoods of local people as it provides vital ecosystem services (World Bank, 2002; Forest People, FPP 2012; Food & Agricultural Organisation, FAO 2015; Anderson *et al*, 2006; Arnold & Townson, 1998; Kaimowitz, 2003; Centre for International Forestry Research, CIFOR 2005). However, these forests are decreasing dramatically in area, threatened by a range of activities including oil exploration activities, bush burning, logging, conversion of forestland to farmlands and forest exploitation that is not being done in a sustainable manner (Okojie, 2007; Houghton, 2003; Oyebo, 2006; FAO, 2005; Onojeghuo & Onojeghuo, 2015; Phil-Eze & Okoro, 2009; Osemeobo, 1988). It is difficult to ascertain the quantity of forest cover loss in Nigeria due to lack of data (Adekunle *et al*, 2011); this has been discussed in more detail in [Section 2.1](#) of this thesis.

These forests take the form of wetlands. Over 80% of the Niger Delta region is seasonally flooded during the wet season. As the dry season progresses, floodwaters recede, leaving permanent swamps and pools. The Niger Delta experiences strong tidal influences with seawater flowing as far inland as to the freshwater floodplains of the

River Nun. These tidal flows create varied ecological niches that support complex and diverse life forms (Obot, 2006; LENF, 1998; SPDC, 2015).

Within these wetlands, distinct vegetation types (the mangroves, freshwater swamp forests and lowland rain forests) are found. The many islands, rivers, creeks, and other water bodies impressed the early Europeans (Allison-Oguru, 2006): Kingsley (1897) stated that *“the great swamp region of the Bight of Biafra is the greatest in the world and that in its immensity and gloom it has grandeur equal to that of the Himalayas”*. Some early writers found the forests overwhelming; Leonard (1906) wrote that *“the country (the Niger Delta area) may be described as one in which Nature is at her worst. From the slime and ooze of the soil up to the devitalizing heat and humidity of the atmosphere, it leaves its mark on the people as an enervating and demoralizing influence.”*

Nevertheless, the Niger Delta contains ecosystems that are locally and globally of ecological and economic importance. The area is amongst the most bio-diverse on earth (Obot, 2006). Singh *et al* (1995) stated that *“the full significance of the Niger Delta's biodiversity still remains unknown because new ecological zones and species continue to be discovered and major groups, such as higher plants and birds, remain unstudied in large areas”*. Powell (1995) considered the Niger Delta a *“biological hotspot”* with many locally and globally endangered species. Obot (2006) also described the *“diverseness”* and *“eco-importance”* of the Niger Delta ecosystem.

These highly varied and complex ecosystems offer a variety of important market and non-market benefits to local stakeholders. For example, they are a source of fuelwood, food, leaves, meat, raw materials, fruit and medicines (LENF, 1998; Alagoa, 1999; SPDC, 2015; Obot, 2006; Allison-Oguru, 2006). The traditional uses of the forests and waterways of the Niger Delta have supplied virtually all the needs of its people in many diverse ways (Isoun, 2006). Ezenwaka *et al* (2004), Obute (2005) and Ogbe *et al* (2009) found that local people derive many benefits from medicinal plants. Some, such as medicine men, earned their livelihoods from the sale of medicinal plants and medicinal plant products and many depend on traditional medicines for their health

(Gesler, 1984; Dauskardt, 1990) following traditions that go back centuries. Akerele *et al* (1991) confirmed the benefits derived from medicinal plants and called on the United Nations and its agencies to take action for the conservation of medicinal plants.

Some more benefits derived from the Niger Delta ecosystem are listed in Box 5.1.

Box 5.1. Benefits derived from the Niger Delta ecosystem (Source: Isoun 2006)

- Wildlife (duikers, civets, monkeys, cane rats (grass-cutters), porcupines, pangolins *Manis* sp., giant rats *Cricetomys* sp., squirrels, bush pigs, monitor lizards *Varanus niloticus*, otters, water chevrotains); snails, giant snails *Achatina* sp., swamp and lake/pond fish, oysters crabs and periwinkles.
- Medicines: Animal parts and skins for traditional medicine and trophies
- Many fruits, leaves, roots, barks and nuts for medicine, food, and spices (e.g. “ogbono” or bushmangos *Irvingia* sp., “afang” leaves *Gnetum* sp., charcoal from *Rhizophora*, and kola nuts *Cola* sp.)
- Plant parts and extracts for cosmetics, dyes
- Rattan for canes, ropes, fish drying racks
- Honey
- Wine from *Raphia* palms
- Plant and animal parts for traditional cultural uses or arts/crafts.
- Shells and saplings for road and path surfacing
- Leaves for wrapping foods for preservation and steaming
- Saplings/vines for construction, fishing equipment and utensils, etc.

Water is also vital to the Niger Delta people. There are very few activities in the Niger Delta that are not directly or indirectly linked to water. Water in the Niger Delta is far more than a simple element of nature. According to Anderson and Peak (2002), in the Niger Delta “*water is synonymous with life itself, with spiritual sustenance, with wealth and prosperity, and especially with communication and identity*”.

However, the extent of use and the value of these resources are not considered in economic assessments and in planning for government and other interventions such as conservation actions (Isoun, 2006). The government’s conservation plans usually restrict access to these resources and thus have real potential for increasing poverty and

conflict (Amoru, 2000; Isoun, 2006; Chukwuone & Okorji, 2008; Guthiga, 2008; Ameha *et al.*, 2014b)

In recent years, the ecosystems framework has emerged as a means of being able to identify the breadth and range of ecosystems goods and services provided by natural capital that are of value to human beings (MA, 2005; DEFRA, 2007); this has been explained in more details in chapter two of this thesis. The Millennium Ecosystem Assessment (MA, 2005) describes an ecosystem as “*a dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit*” and the benefits that people derive from their ecosystems are collectively referred to as *ecosystem services* (MA, 2005; DEFRA, 2007; Graves *et al.*, 2009).

A useful feature of the ecosystem services approach is in how it shows the diversity of beneficial flows from natural capital and in how it provides a framework for recognition and valuation of both “*in use and non-use*” services (Graves *et al.*, 2009). Since the Millennium Ecosystem Assessment (MA) framework highlighted the critical dependency of humankind on the environment, and the degradation that puts that dependency at risk, the ecosystem services concept has been used as a means of identifying, categorizing, and valuing the benefits that ecosystems provide, and the concept is now firmly established as an analytical tool in policy agenda (Gómez-Baggethun *et al.*, 2010; Fisher *et al.*, 2009).

These services according to the MA (2005) include:

- i. *Provisioning services* such as food, fresh water, wood, fuel and fiber;
- ii. *Regulating services* that affect climate, flood, disease, and water purification;
- iii. *Cultural services* that provide recreational, educational, aesthetic, and spiritual benefits; and
- iv. *Supporting services* such as soil formation, photosynthesis (primary production) and nutrient cycling.

The recognition and value of each of the above ecosystem services vary greatly depending on whether the impact is direct or indirect. Those services that have a direct impact on livelihoods (such as food, fiber, fuel wood, some cultural services and recreation) can be more easily recognized and valued. Other services, which often provide non-market public benefits (such as regulation of the climate, the purification of air and water, flood prevention, soil formation and nutrient cycling), are less recognized and more difficult to value (DEFRA, 2007; Graves *et al.*, 2009). Hence these services are frequently omitted from decision-making and policy appraisals (Isoun, 2006; DEFRA, 2007; Graves *et al.*, 2009).

The specific objective of this chapter was to use the ecosystems framework to identify how: (i) aware the Niger Delta people were of the various ecosystem services provided by the Niger Delta forests, and; (ii) to find out the most valued ecosystem service to them. This objective was of particular importance because of the disproportionate emphasis placed on crude oil production in the region that has resulted in the neglect and degradation of forest resources, and inflamed the conflict that has characterized the region since the 1990s (Kalama, 2012a & b; Darah, 2001).

5.2 Method

5.2.1 Niger Delta region and case study sites

The field study was carried out between October 2013 and May 2014 in Bayelsa State, Niger Delta, Nigeria. Participants were drawn from two rural communities (Akpide-Biseni and Akipelai-Ogbia), and one urban centre (Yenagoa). Further details on how the communities were selected as well as locations have been discussed in [Section 3.2.2](#). The stakeholder forum, which was held in December 2014, also provided data for some sections of this chapter.

5.2.2 Development and use of ecosystem services questionnaire

The MA's ecosystem services framework was adapted ([Table 3.2](#)) for use for the collection of field data. The questionnaire was used to collect category data on respondent's awareness of forest ecosystem services from both urban and rural respondents. Whilst in the urban areas, the questionnaires were self-completed (by the

respondents), in the rural areas, the questionnaire was used as an interview schedule to guide discussion during the interview (because many of them could neither read nor write). The category data were collected directly on the questionnaire form whilst the narrative data were collected using written notes and a voice recorder, where possible.

Forty properly completed and analyzable questionnaires were retrieved from the 75 that were distributed to respondents in the capital metropolis of Yenagoa (the method of selecting the respondents is already discussed in chapter three of this thesis). The same interview schedule was used as a checklist for semi-structured interviews with 50 rural respondents. In the rural communities, a local facilitator was engaged to help interpret the questions into the native language. This was in addition to the use of the Pidgin English language (generally spoken within the region) to explain each of the ecosystem services to the respondents. The entire concept was translated into locally relevant ideas that the rural dwellers could identify with. In order to improve accuracy, the same question was asked in different styles. Each interview lasted between 30-50 minutes. Justifications for these strategies are already provided in chapter 3 of this thesis.

The questionnaires were retrieved from the urban respondents and the results collated. In the rural areas, the response of the interviewees was noted against each question as the semi-structured interviews proceeded. The results were also then collated. In total, 90 respondents were sampled for this purpose.

5.2.3 Data analysis and presentation

The data from the survey were collated in a Microsoft© Excel spreadsheet and were analyzed to obtain descriptive statistical information that are presented in histograms. This was done because the main aim of this section was to identify how many and to what extent, respondents were aware of forest ecosystem services in the Niger Delta Nigeria.

5.3 Results

5.3.1 Awareness of ecosystem services

Urban respondents

From Figure 5-1 and Figure 5-2, it was evident that as a collective group, the urban dwellers were aware of the entire ecosystem services listed in the MA's framework (MA, 2005). When the mean score was calculated for each broad ecosystem category (Figure 5-1), the highest level of awareness (91.7%) was for "supporting" services, followed by 78.5% for "provisioning", 73% for "cultural" and 60.6% for "regulating" services. The low score for awareness of "freshwater" reduced the score for the "provisioning services" whilst the high awareness of all the sub-categories of the "supporting services" category meant this had the highest average score.

However, the percentage of urban dwellers that were aware of specific ecosystem services differed (Figure 5-2). Awareness was high for some. Whilst 100% of the urban dwellers were aware that the forest provides "wood", 97.5% of them knew about the provision of "food" and "nutrient cycling" services. Most urban dwellers (92.5%) were aware of the "primary production" function of the forest while 90% were aware of "fibre" provisioning service. About 87.5% of urban dwellers were aware of aesthetic benefits, 85% were aware of the "soil formation" function, 82.5% of the "climate" regulation function. The level of awareness dropped to 77.5% for "recreational" service, 75% awareness for "educational" function, 67.5% for "flood" regulation, 65% for "disease" regulation, 62.5% for "fuel" provisioning and 52.5% awareness for "spiritual" services. The level of awareness was relatively low for "freshwater" provisioning and "water purification" services, at 42.5% and 27.5% respectively for the urban respondents.

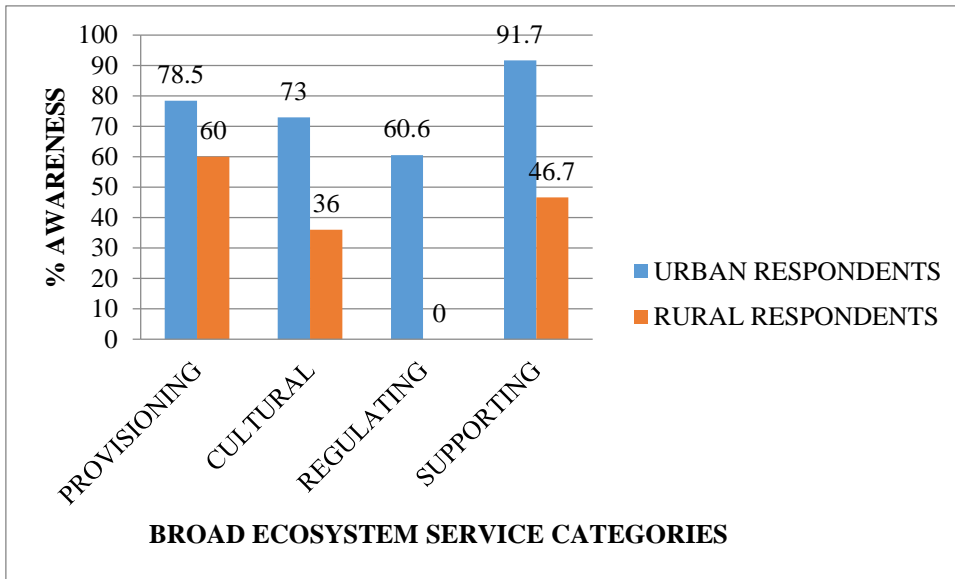


Figure 5-1. Proportional awareness of ecosystem services by urban and rural respondents

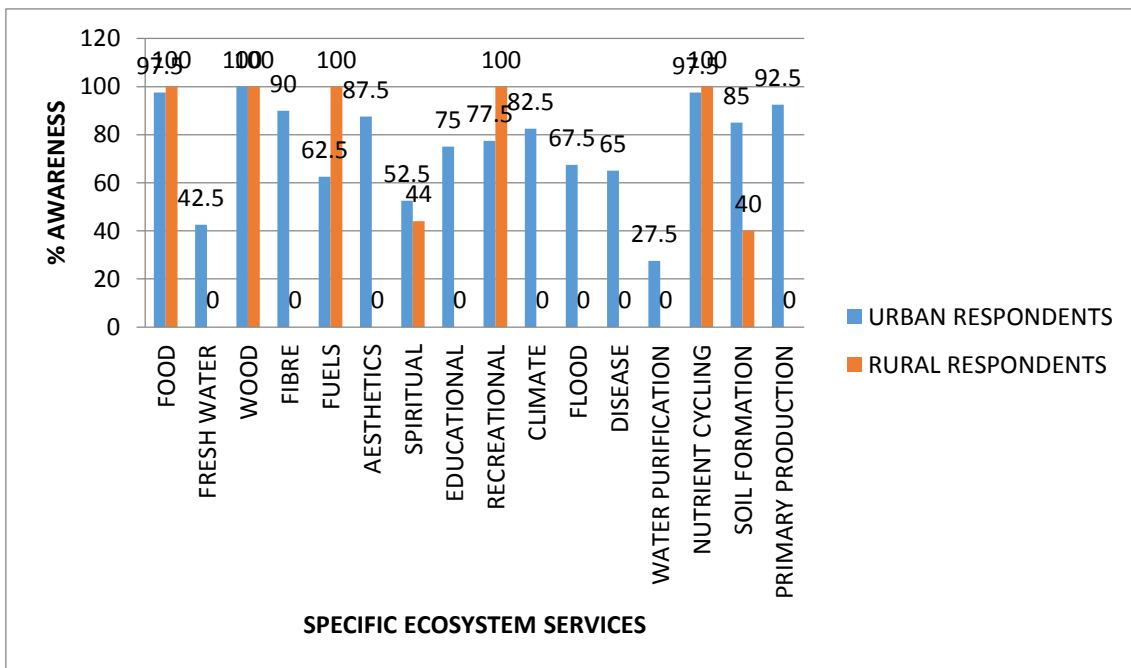


Figure 5-2. Proportional awareness of specific forest ecosystem services by urban and rural respondents

Rural respondents

This was in sharp contrast to the responses from the urban dwellers. Figure 5-1 and Figure 5-2 shows that the rural dwellers were only aware of such ecosystem services as related directly with their livelihood provisions. All 100% of them were aware of “food, wood and fuel” provisioning as well as “recreational and nutrient cycling” services. But only 44% of them are aware of “spiritual” services and just 40% were aware of “soil formation” services. Beyond the above listed ecosystem services, no other ecosystem service was known to the rural dwellers. Although these other unknown (freshwater, fiber, aesthetics, educational, climate, flood, disease, water purification and primary production) services affected their lives on a daily basis, they seemed not to be conscious of it.

The average scores for the broad ecosystem categories (Figure 5-1) saw the “provisioning services” having the highest average awareness score of 60%. This score was this low because of the zero scores for “freshwater and fiber” provisioning services. The second highest average score was for “supporting services” with an average awareness score of 46.7%. These people are farmers and were aware of the nutrient cycling function of the forests as they practice shifting cultivation as a system of farming. The third was “cultural services” with an average awareness score of 36%. The worst was “regulating services” where there was no score at all.

The low awareness by the rural dwellers of many ecosystem services is of concern because these are the closest people to the forests and their daily activities impact on the ecosystem service flows.

5.3.2 Value of ecosystem services

Urban respondents

When asked which of the ecosystem services that they were aware of was the most valuable to them (Table 5.1, Q5), 57.5% of the urban respondents answered that the provisioning services were most valuable (Figure 5-3) whilst 37.5% stated that the regulating services were most valuable to them. The remaining 5% stated that cultural

services were most valuable to them. None of the urban respondents stated that supporting services were of any value to them.

On specific preferences for these services (Figure 5-4), 37.5% of the urban respondents stated that food-provisioning service of the forest was most valuable to them. Another 37.5% said that the climate regulation service of the forest ecosystem was most valuable to them. Some urban respondents (15%) identified wood as the most important provisioning service to them, and a far smaller number mentioned fibre (2.5%) and fuel (2.5%). The cultural services mentioned by urban dwellers as most important were spiritual (2.5%) and educational (2.5%) services.

Rural respondents

In contrast, 100% of the rural respondents stated that provisioning services were most valuable to them (Figure 5-3 and Figure 5-4).

In the case of rural dwellers, the patterns was very different, with 96% of the rural respondents identifying the food provisioning service as most important to them and 4% mentioning that the provision of wood was most valuable to them. No other benefits were identified as being most valuable by the rural dwellers.

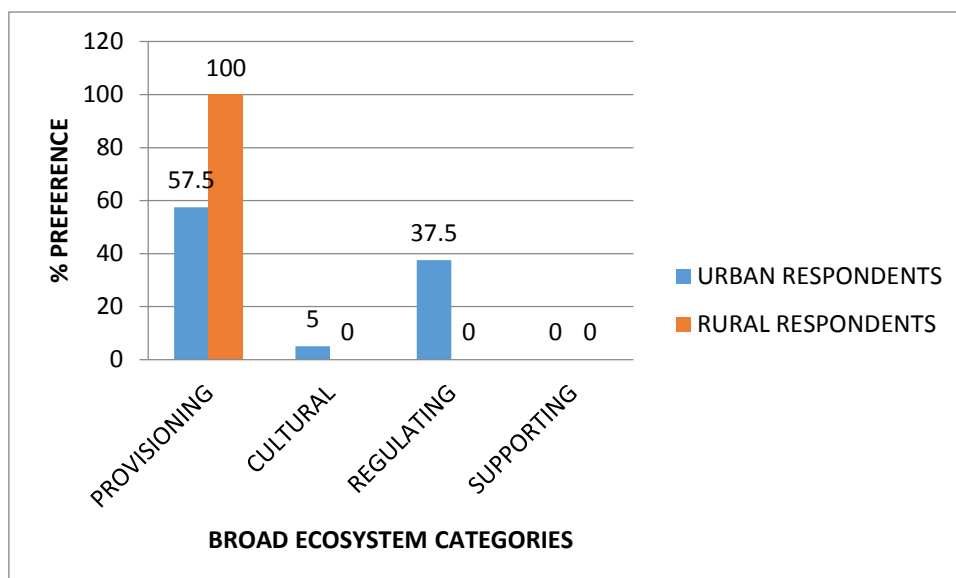


Figure 5-3. General preference for ecosystem services by urban and rural respondents

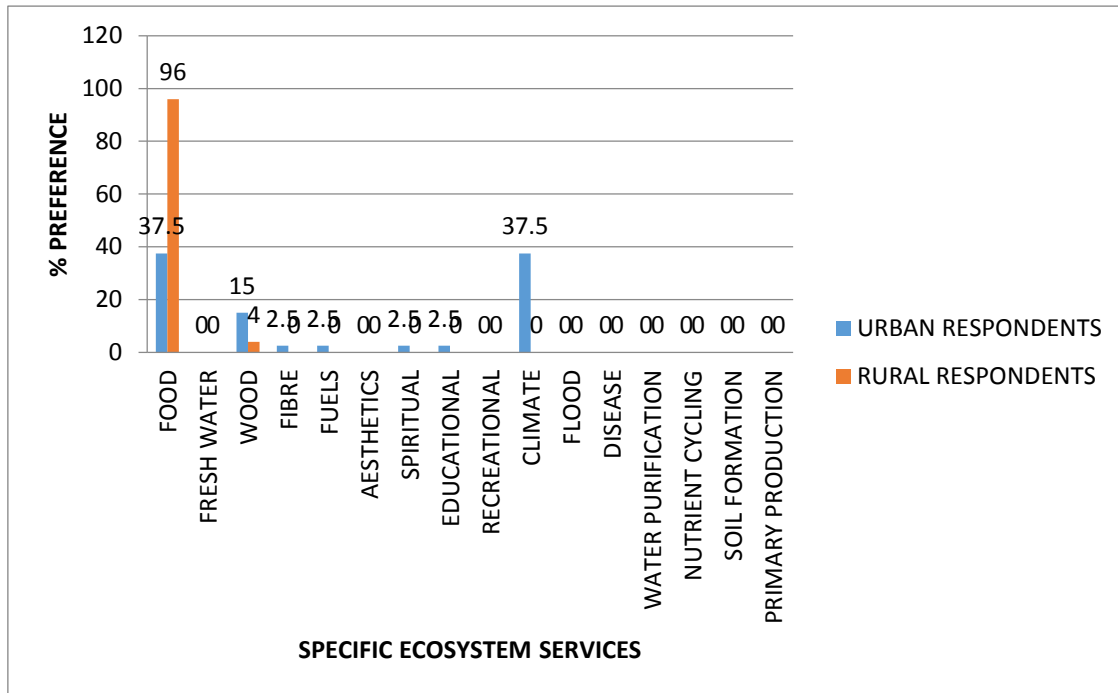


Figure 5-4. Preference for specific ecosystem services by urban and rural respondents

5.4 Discussion

5.4.1 Awareness of forest ecosystem services

The results as shown in sections above, shows that whilst more than 50% of the urban respondents were aware of most of the ecosystem services, less than 50% of them were aware of services such as water provisioning and purification. This tells that the urban residents think of “wood” essentially when the word “forest” is mentioned. The exceptionally low awareness for “freshwater” provisioning and “water purification” service is worrisome; the not so tangible ecosystem services are hardly recognized (Isoun, 2006; DEFRA, 2007; Graves *et al.*, 2009; Adekola *et al.*, 2015).

The rural dwellers had no awareness that forests were important in terms of providing fresh water and fibre, aesthetics and educational value, and were unaware of regulating service or of cultural services and some provisioning services. It was evident that rural respondents were mostly aware of those benefits that related to their daily livelihoods.

Yet, these services are as vital to the wellbeing of rural dwellers as those that they were aware of.

It is important to work to improve the knowledge of these ecosystem services especially among the rural dwellers as Willock *et al*, (1999); Poppenborg and Koellner, (2013); and Zhang *et al*, (2015) confirms that knowledge can affect attitude towards conservation initiatives or practices, stakeholder knowledge of ecosystem services is necessary in formulating useful and workable policies (Hauck *et al*, 2013; Urgenson *et al*, 2013).

For rural dwellers, the forest is considered by them as a source of income and employment; statements such as, *‘there is no person here that does not take something from the forest either for sale or for home consumption’* (Participant 13); *‘we do not have access to government or private sector employment here, so I will say that we depend almost entirely on our environmental resources’* (Participant 2); *‘all we use comes from the forest’* (Participant 26) (Box 4.1, Box 4.2) supports this position.

The MA (2005) stated that the ecosystem services are vital to the livelihoods of especially, the poor; this is supported by many other works such as Aruofor, (2001); Angelsen & Wunder, (2003); Shackleton & Shackleton, (2004); Vedeld *et al*, (2007); Bryon & Arnold, (1997).

5.4.2 Most valuable forest ecosystem services

The urban respondents felt that “food provision” (37.5%) and “climate regulation” (37.5%) were of greatest importance as forest ecosystem services and both were given equal importance (Figure 5-3 and Figure 5-4). The reasons for this were because the urban people knew that most food products were from the forest areas and were also equally aware of various environmental campaigns aimed at curtailing global warming and climate change. However, when the percentage scores of the specific services were added together under each broad ecosystem service category, 57.5% of the urban respondents highlighted “provisioning” services. The score of 37.5% for the “regulating” services from the urban respondents shows their level of awareness to the

importance of the forest in this regard. The score of a total of 5% for “cultural” services suggests that a few urban residents still appreciate this service compared to a score of 0% for “supporting” services.

The above is a huge contrast to that of the rural respondents. The rural dwellers placed more value on “food” as 96% of them preferred “food” while the remaining 4% preferred “wood” (Figure 5-3 and Figure 5-4). It is worth mentioning that the 4% that preferred “wood” were actually loggers; logging is their source of livelihood. When the scores were added together, 100% of the rural dwellers chose “provisioning” services of the forest ecosystem above all other services. This is again in line with previous works already cited above in section 5.4.1 that ecosystem services are very important to the livelihoods of especially, the poor. They have no other alternatives; to them, the ecosystem services are life. The result of the interviews also showed that 100% of them depended on environmental resources for sustenance. They did not have any other resource from which to earn a living.

5.4.3 The ecosystem framework

The categorization used by the Millennium Ecosystem Assessment (2005) was useful as it covered most of the services identified by stakeholders. There were some services provided by the Niger Delta environment that were not expressly included (in the framework) such as transportation. It is worth noting that other versions of the ecosystem framework (De Groot, 2006) list transportation under “carrier” functions of the ecosystem.

Many of the communities in the Niger Delta cannot be accessed by road. They rely on the water networks for transportation of both humans and goods. It is these river networks that take them to their farmlands. Also, owning a fibre boat or locally made wooden canoe, is a sign of wellbeing and status in these river-based communities. A fibre boat that is powered by an outboard engine (Figure 5.5a) is a means of commercial transportation. A wooden canoe (Figure 5.5b) is a valuable transport asset to local people and it is more affordable than a fibre boat.



Figure 5-5: (a) a fibre boat powered by an outboard engine (b) a wooden canoe paddled by two women returning from their farm

Fishing and table salt production are among other uses to which the water resource of the Niger Delta is put (LENF, 1998; Isoun, 2006). De Groot (2006) also listed mining, waste disposal, and cultivation under the “carrier” functions. It was observed that these were all benefits for rural dwellers of the Niger Delta; sand mining and domestic waste disposal were observed at streams.

Other very important provisions from the Niger Delta forests, which were not expressly listed in the MA’s framework, were medicines and raw materials; the rural respondents mentioned these as part of benefits from their forests. LENS (1998), Alagoa (1999), SPDC (2015), and Obot (2006) confirm the importance of the Niger Delta forests in providing medicines and raw materials for the people; the herbs are used as medicines, this also serves as a source of employment / income to those that deal in medicinal plants. DEFRA (2007) listed medicine under the “provisioning” services while De Groot (2006) listed medicine and raw materials under the “production” functions.

Rattan is a useful raw material harvested freely from the Niger Delta forests. It is used in making items including fishing gear and furniture (Figure 5-6). The participant in Figure 5.6b earns his living from the harvesting and use of rattan.



Figure 5-6: some items made from rattan (a) Fishing gear; a non-return valve trap (b) Furniture

Rural people do not have easy access to other means of domestic fuel for cooking; they rely on firewood, which is freely available in their forests (Figure 5-7). Sand mining is a means of livelihood for some rural dwellers (figure 5.7b). This is also their source of sand for building and other works.



Figure 5-7: (a) Fuel wood for domestic cooking (b) Sand mining from perennial streams

5.4.4 Ecosystem dis-services

During the stakeholder forum, the issue of ecosystem services and dis-services was discussed. Table 5.1 shows some outputs that are relevant to this section of the thesis.

While the forum agreed that *the forest is important to the livelihoods of the Niger Delta people*, they identified *habitat function, breeding ground for wildlife, medicinal value, bio-fuel and wind break* as other important services that were not explicitly shown in the MA's framework. Also, *breeding ground for mosquitoes, snakes, criminalities, hiding place for kidnappers and militants* were identified as dis-services for the Niger Delta.

Table 5.1: Some themes discussed in plenary during the stakeholder forum

S/N	Themes	Forum's Conclusions
1	Ecosystem Services & Dis-services <ul style="list-style-type: none"> • Importance of the forest to the economy and livelihood of the community people • Other services not already enumerated in the MA's framework • Dis-services 	<ul style="list-style-type: none"> • The forest is important to the livelihoods of the people of the Niger Delta • Other services (in addition to the ones enumerated in the MA's framework) include: habitat function, breeding ground for wildlife, medicinal value, bio-fuel, wind break • Dis-services include: breeding ground for mosquitoes, snakes, hiding place for kidnappers and militants, criminalities

5.5 Conclusions

As simple as the MA's ecosystem services framework looks, it is not easily understood especially by the rural participants. It therefore needed to be adapted and the concepts interpreted for the participants, sometimes through an interpreter. This process was complex and time-consuming during interviews, when questions would need to be asked in several different ways to ensure that the participant had correctly understood it.

However, it is concluded that the forest is valuable to both the urban and rural dwellers of the Niger Delta Region of Nigeria. It has also become evident that apart from crude oil, for which the region is known, the dwellers appreciate other services provided by their environment.

The low awareness level of some of the vital ecosystem services calls for immediate and urgent action to be taken to make positive changes. The Niger Delta is a region where because of the difficult terrain, a significant part of the forests (especially the mangroves) have not yet been lost to logging. Government and its development partners should invest in awareness creation as regards the benefits of conserving these forest resources.

6 POLICY AND INSTITUTIONAL ANALYSIS FOR SUSTAINABLE MANAGEMENT OF NIGER DELTA FORESTS

This chapter considers the issue of forest policy and institutions in the context of sustainable use and conservation of the Niger Delta forests. This has already been published in the *International Journal of Innovations in Environmental Science and Technology* (Volume 5/1, 2015, pp64-74). The version presented here has been modified (in places) to improve clarity for the reader.

6.1 Introduction and background

The Millennium Ecosystem Assessment (MA, 2005) stated that “nearly two thirds of the services provided by nature to humankind are found to be in decline worldwide” and according to DEFRA (2007), “the benefits reaped from our engineering of the planet have been achieved by running down natural capital assets”.

The forests of the Niger Delta have supported the livelihoods of local communities for many generations. However, many factors, including unsustainable harvesting of forest resources, primarily for timber, and crude oil extraction, are reducing and degrading the Niger Delta forests. As a result, the forest ecosystems, and the services they provide, have been under increasing pressure, and this is threatening the forests’ ability to support local livelihoods (NDES, 1997; LENF, 1998).

When forests are logged, destroyed, or converted to other uses, local communities, and in particular women, suffer from the loss of non-timber forest products (Isoun, 2006). In the Niger Delta, local communities depend almost entirely on these raw materials, and the products derived from them, for everyday income and survival (see sections 4.3.1, 4.3.2 and 4.5 of this thesis). Some of these raw materials include wood (for building, fuel, carving of various items including canoes, paddles, drums); rattan (cane rope) which is used in making furniture; wine which is tapped from the raphia and oil palm trees are sold either as fresh palm and raphia wines or are distilled into local gins; the palm fronds are used in making brooms; twines and lianas are used as ropes and

making of sponges; wildlife (including snails) are sources of protein and also commercial commodities; various plant parts are extracted for medicines; various fruits are collected for domestic consumption and for commercial purposes e.g. ogbono (*Irvingea gabonensis*). These materials and products are vital in local economies of Niger Delta communities (LENF, 1998; Isoun, 2006).

There appears to be a high preference for current consumption of forest resources, so that future benefit flows are highly discounted and the ability of forests to regenerate at a rate capable of meeting demand may have been exceeded in many parts of the Niger Delta, with the result that many of the forest stocks producing those resources are in terminal decline (see section 4.3 of this thesis). Associated with these issues is a range of other environmental problems such as erosion, infertile agricultural lands, and decline in forest and water resources (NDES, 1997).

In recognition of this, certain conservation and preservation measures have been implemented by the Nigerian government, including measures for setting aside forest reserves through the enactment of laws. But these efforts are not yielding the expected results, as illegal and unsustainable hunting and collection of forest resources are still resulting in forest and biodiversity loss and degradation (LENF, 1998; Amoru, 2000; Chukwuone & Okorji, 2008).

The aim of this chapter is to examine the policy and institutional arrangements around Niger Delta forests to assess how their use and conservation can be improved.

6.2 Method

The method in this chapter drew on the method described in more detail in the method chapter of this thesis. A brief description is therefore provided here.

A review of literature and policy was used to develop an analytical framework for identifying the key challenges to having effective forest policies, and providing possible solutions to the management of Niger Delta forest resources. The key frameworks were

the application of the *Sustainable Livelihoods Framework* (Carney, 1998; DfID, 1999) and the *Ecosystem Framework* (MA, 2005).

In addition to the field surveys that involved the rural and urban respondents, interviews that were conducted with the State Department of Forestry and some Civil Society Organisations were also useful in the development of this chapter. The outcomes of these surveys were discussed during the stakeholder forum. All these contributed data to the development of this chapter.

6.3 Results

6.3.1 Forest conservation initiatives

It was found that there were efforts by the community, oil production companies and government to conserve the forest resources but there was no synergy among them; it appeared that each stakeholder was acting alone. The government had initiatives aimed at conserving the forests; the same was for the Shell Petroleum Development Company (SPDC). The communities also had initiatives aimed at conserving the forests.

The communities were not aware of efforts made by government to conserve the forest resources (see Table 6.3). This result corroborates the work of Adekunle *et al* (2011), which was carried out in South-West Nigeria where he reported that only 1% of respondents knew of any government efforts aimed at conserving the forest resources, whilst the majority said they had never participated in any government programme aimed at conserving the forest. The communities were not completely implementing the Shell Petroleum Development Company's (SPDC) strategy (see section 6.3.3 of this thesis) aimed at community development. The active involvement of the communities in the processes of planning and execution of these initiatives would have yielded better results according to Arowolo *et al* (2014).

However, the communities' initiatives were well known in the communities (see Table 6.3) and were highly effective (see 6.4.3). The community participants considered that it would be an *infringement on their rights* if government were to make any laws to conserve some of their forest resources (see Box 6.1), and it was incorrectly considered

that such laws aimed at conserving their forest resources would deprive them of their daily livelihoods. But the native laws were well observed and no participant could recollect any case of default. The native laws appear to have been well respected because they are linked to deities (see comments by participants 10, 19, 27 and 31 in box 6.1 in support of this; this is also supported by Anwana *et al.*, 2010; Nwosu and Anwana, 2013) and have become a part of the daily lives of the local communities. People also held the belief that those laws were meant for their ultimate benefit. Some data are presented in Box 6.1.

The community people said that the government laws were not operational in their communities: *we enter any part of our forest; we collect any resource that we like (Participant 1)*. They also asked *by the way, why would government make laws for our own forest? So, will we not eat (Participant 7)?* Concerning the conservation of their forests, they said *But if we convert all of our forests and creeks into forbidden places, where do we get our daily food (Participant 32)?* This is a misunderstanding of conservation principles, which actually aims to provide wise use or planned utilization of the resources. According to Mmom and Arokoyu, (2010), the idea of conventional forest resources conservation is “alien” to local inhabitants and are often opposed by the people (Eneji *et al*, 2009).

Regarding their native laws, they said *these laws are very effective, any contravention attracts serious sanctions so the people obey and live by the rules (Participant 1); these laws are well observed; consequences are grievous. If you kill a crocodile, the law stipulates that you bury it as you would a human being (the ceremony that goes with it) (Participant 2); people dread to contravene these laws. Even as a non-native, ignorance is not an excuse (participant 3); we grow up to know it (it is handed down); our native laws are part of our custom and tradition; it is part of us (Participant 5)*.

Box 6.1: Respondent views on formal and traditional forest conservation initiativesOn government laws

- *We enter any part of our forest; we collect any resource that we like. Only that if you take timber outside the community towards the city, the Forest Guards may stop you and charge you for felling of timbers. (Participant 1)*
- *By the way, why will government make laws for our own forest? (Participant 7)*
- *So, will we not eat? (Participant 7)*
- *But if we convert all of our forests and creeks into forbidden places, where do we get our daily food (Participant 32)?*

On community laws

- *We have native laws that protect our lakes. We do not fish in those lakes that our laws protect until after three years. But these young ones of these days are impatient, they are modifying the laws every time, they now fish in those lakes every two years. This is affecting the size of catch; the fishes are becoming smaller. We also forbid the killing of crocodiles in this community. Participant 1*
- *Lake Esiribi, Ayu, Eremini, Puro, Mowei, Asemini, Kilapuro (have laws protecting them). Participant 1*
- *These laws are very effective, any contravention attracts serious sanctions so the people obey and live by the rules (Participant 1)*
- *These laws are well observed; consequences are grievous. If you kill a crocodile, the law stipulates that you bury it as you would a human being (the ceremony that goes with it). Participant 2*
- *People dread to contravene these laws. Even as a non-native, ignorance is not an excuse. Participant 3*
- *We grow up to know it (it is handed down). Participant 5*
- *Our native laws are part of our custom and tradition; it is part of us (participant 5)*
- *It is such that even the very young ones knows that you should not harm a crocodile or that you are not supposed to fish in a lake until a certain period. Participant 8*
- *The opening of the lakes for harvesting is always heralded by festivals and people look forward to it. Participant 8*
- *No one challenges them. They are tied to deities. Participant 10*
- *We get good catch only from our lakes. We always look forward to the lakes being opened for fishing. Participant 19*
- *If not for the laws, we will not have fish anymore anywhere. Participant 19*
- *No one cuts trees or farm in these areas (eledum forest). But you can hunt. There are also creeks where we do not fish until certain periods (3-4 years). It is called Obatubo creek. The priest is called Aduein. In the Obatubo creek, you can fell trees but cannot fish. Participant 27*
- *A ritual must be performed before fishing is allowed. Even if a fish jumps into your*

canoe, you have to throw it back into the creek. Participant 27

- *As at present, those are the only places we get very good harvest (whenever it is opened for exploitation). We look forward to it. Participant 31*
- *It has become a way of life here; we do not struggle to obey it. It is tied to our tradition. We grow up to meet it and we transfer it to our children. No one questions it. Participant 31*

6.3.2 Tenure rights, land ownership and access to forest resources

Tenure rights and land ownership have implications for access to forest resources and by extension, livelihoods of the people (Ebeku, 2002). There are two land ownership regimes in operation at the same time in Nigeria: (1) the military government promulgated a land use decree in 1978, which transferred the right of land ownership to the government (Act, 1990; Ebeku, 2002). Although many advocacy groups and ethnic nationalities have called for the abolition of this law because of its retrogressive nature (Francis, 1984), the law is still in operation and is invoked whenever the government needs any portion or parcel of land for her purpose, otherwise, (2) the age-long traditional (communal) land-ownership and access rights are used by communities. In the communal land ownership method, the participants stated that *the land is held in trust on behalf of the community by the community head and on behalf of the family by the family head. Lands are sub-divided among the male family members. Women do not own lands but have rights to farm on family lands and are able to collect NTFPs (Participant 1).*

Furthermore, participants noted that *the owner of a land owns the timber on that land but there are no restrictions to hunting and collection of NTFPs except from the forbidden places in the community forests (participant 1).* When government acquires the land, compensation is sometimes paid for crops and houses. An entire community can be relocated if the government wants the land.

The types of lands or forests that are constituted into a forest reserve by the government include (Participant 51):

- *lands at the disposal of the government* (by the land use decree of 1978, the implication is that all land is actually at the disposal of the government. This can

have implications for the livelihoods of the rural dwellers that depend on these forest resources for survival);

- *lands of which the forest growth are threatened, and;*
- *forests, which contain certain species of plants and animals that needs to be protected (e.g. the Edumanom forest reserve of which Akipelai community belong to and Taylor Creek forest reserve of which Akpide belong).*

The [participant 52](#) stated that *the biodiversity value of Edumanom and Taylor Creek Forest reserves are universally recognised because of the Niger Delta Red Colobus (Procolobos epieni) monkey which is classified by IUCN as critically endangered and is currently the 25th most endangered primate. These forests also stock some valuable economic timber tree species such as Miletia excelsa (Iroko), Khaya spp (Mahogany), Nauclea diderrichii (Opepe), Afzelia spp (Apa), Terminalia ivorensis (Black afara), Mitragyna ciliata (Abura) and Lovoa trichiloides (walnut).*

Other objectives of managing the two forest reserves according to [participant 52](#) are:

- *to ensure effective conservation of endangered and endemic fauna and flora species (e.g. Elephants, Hippopotamus, Crocodiles, Chimpanzees and M. excelsia, K. ivorensis, M. ciliate);*
- *cane (rattan) production, fish production, fruits and vegetable production;*
- *to offer employment opportunities to the host communities;*
- *to provide opportunities for community development, recreation and tourism, and;*
- *to ensure full multiple use of forest on a sound environmental basis.*

A careful look at these objectives of creating the forest reserves confirms the assertion of Amend & Amend (1995) that said that the focus is more on preserving the ecosystem and not much on the benefit of the people.

According to the [participant 51](#), the procedure for constituting a forest reserve consists of:

- *the appointment of an officer who oversees the entire process;*

- *a visit to the host communities* (three visits);
- *a publication of governments intention to conserve that forest, and;*
- *a determination of rights and privileges of the host communities*, before the final decision is taken (Box 6.2).

Box 6.2. Procedure for constituting a forest reserve (source: Bayelsa state forestry department)

- i.** Visit by Forestry officials to the Forest reserve host communities to enlighten them of the need to constitute the Forest reserve
- ii.** At least three (3) times meeting of government officials and the Forest reserve host communities
- iii.** Publication in the gazette a notice;
 - a.** Specifying the situation and the limits of the lands
 - b.** Declaring that it is intended to constitute the lands as forest reserves, either for the general purposes of the government, or for a particular use and benefit
 - c.** Appointing an officer, “Reserve Settlement Officer” to inquire into and determine the existence, nature and extent of any rights, claimed by or alleged to exist in favour of any person or community
 - d.** Upon the completion of the inquiry, the Reserve Settlement Officer shall submit to the Director of forestry for the consideration of the commissioner, his findings, describing the limits of the laws specified in the publication and setting forth, with all such particulars as may be necessary to define their nature, duration, incidence and extent, all claims and alleged rights preferred or brought to his knowledge in respect of the lands and admitting or rejecting the same wholly or in part.
 - e.** The Commissioner may extinguish any such rights or claims and shall either give monetary compensation or grant in exchange for similar right on any similarly situated land either within or without the final boundaries of the forest reserve if such right would stultify the objects of the proposed forest reserve.
- iv.** The Commissioner shall, thereupon, publish a notice in the gazette specifying;
 - a.** The lands which it is finally intended to constitute a forest reserve
 - b.** The rights which may be exercised within the proposed forest reserve

The procedure and the policy seem to be well planned out. It also has a provision for involving the potential host communities. The implementation is however not always followed through ([this is supported by Chukwuone & Okorji, 2008](#)); reasons given included *lack of materials to work, bureaucratic bottlenecks and inadequate funding (participant 51)*. If the laid down procedure were followed through, the communities

would have been aware that they are hosts to a government forest reserve (see section 6.3.1). When a forest is taken from the community and is constituted into a reserve, harvesting of forest produce is prohibited except with the authority in writing of the forest officer (Box 6.3).

Box 6.3. Some laws that govern forest reserves (Bayelsa state forestry department)

- Harvesting of forest produce is prohibited except with the authority in writing of a Forest officer, not below the rank of Forest Officer 2.
- Other prohibitions include:
 - Uproots, burns, strips off the bark, or leaves from, or otherwise damages, any tree in a Forest reserve is an offence
 - Sets fire, to any grass or herbage without taking due precaution to prevent its spreading
 - Pastures cattle
 - Digs, cuts or cultivate the soil or makes a farm or plantation
 - Trespasses in any part of a forest reserve
 - Resides or erects any building
 - Hunts or fishes without the authority in writing, of a forest officer
 - Damages, in any way, or destroys any forest property in a forest reserve

These stringent rules have deprived rural dwellers of their livelihoods. Dixon & Sherman (1991) describe how such access restriction to forest dwellers have shut the door on their livelihoods. Furthermore, these conditions, without alternatives, create conflict situations according to Lewis (1996). The people depend on this forest for almost all of their daily needs (see section 4.3.1). This is part of the reasons why poaching and illegal collection of forest produce is still rampant (especially as there are no alternatives for the people). Stringent enforcement of these types of rules in an environment where the people do not have any other alternative can lead to crisis and serious conflicts. In the works of Ameha *et al* (2016) and Bekele & Ango (2015) in Ethiopia, they found that the provision of alternatives to the people in a PFM arrangement eliminated conflicts resulting from natural resource use and similar results was reported by Senganimalunje *et al*, (2015) in Malawi.

The provision that is made for the host community is that of *Right of free permit to farm, fish, hunt, collection of minor forest produce, fuel wood, and harvesting of timber for community project*. It is good to note that this approval is again at the discretion of the forest officer ([participant 51](#)).

There have been conflicts and lessons learnt ([participant 52](#)). The conflicts have been in the form of *communal conflicts, land boundary disputes, and conflicts as a result of restrictions on exploitation of undersized timber trees and endangered wildlife species*. Other challenges include *inadequate funding, poaching, illegal exploitation of the forests, farming activities, non-payment of monetary compensation to land owners*, which has always jeopardized the constitution of forest reserves. [Chukwuone & Okorji \(2008\)](#) gave neglect and lack of further investments in those conservation areas as reasons for their ineffectiveness. A review of the laws that govern the forest reserves as well as the introduction of incentives (e.g. as in Ethiopia and Malawi) would likely improve the cooperation of the rural dwellers.

6.3.3 The Shell Petroleum Development Company and forest conservation

The materials in this section are collated from the interviews with the SPDC staff and the two civil society organisations that act as mentors to the benefitting communities ([Participants 53, 54 and 55](#)).

The Shell Petroleum Development Company (SPDC) recently (2005) developed the Global Memorandum of Understanding (GMOU) through which all issues of community interests are now handled. The GMOU brings together communities, clans or kingdoms and classifies them into clusters; these clusters are hosts to SPDC's interests and activities. SPDC negotiates with the clusters and agrees to provide a minimum amount of money for the cluster to carry out development projects and activities in the cluster. The amount agreed with the cluster and the process of managing the fund is thereafter captured in a document referred to as the GMOU.

One thing that is peculiar about the GMoU is that SPDC now has a single common way and process of relating with its communities in any state or matter. The GMoU became operational in 2006 with Rivers and Bayelsa States leading the operation.

The model is an approach to social investment designed to allow clusters of communities to take ownership of their own development. The GMoU is a comprehensive agreement that governs the relationship between the communities within a cluster and the SPDC over a 5-year period. When effectively implemented, this process will assist every GMoU cluster and its constituent communities, to develop the capacity to own and manage their own development programs.

The delivery of the GMoU is guided by fundamental principles of sustainable development and good governance. There are Community Trusts (CTs) and Cluster Development Boards (CDBs) set up to manage the entire process. Whereas SPDC provides bulk funds to them to manage, the clusters come up with their priorities for the 5-year period. They (communities) are free to implement what they consider most important to the community. Some NGOs are engaged by SPDC to act as mentors to these clusters.

The implementation of the GMoU promotes inclusiveness at all levels of society, specifically through:

- *Ensuring the involvement of women, youth and the poorest in all decision-making, planning and project implementation activities. Each project or activity has to take into account the needs of the various segments of the community.*
- *Engaging women, youth, non-indigenes, the elderly and other minority and vulnerable groups in the community in the community development process. To ensure appropriate representation of women in the CTs, CDBs and project committees, women occupies at least one of three key positions in the CT; Chairman, Secretary or Treasurer.*
- *Ensuring the right of every member of the community to be represented by his / her peers in the decision-making and GMoU implementation structures of the*

community. The CTs and CDBs ensures that all segments and groups in the community / cluster are represented in the decision-making process.

- *Involving existing community interest groups through all steps of the participatory planning cycle as a means of encouraging ownership by the communities, and making them take pride in their accomplishments and self-reliance.*
- *CTs and CDBs works with the existing recognized and respected traditional structures to mobilize, inform and invite the different segments of the community (women, youth, fishermen groups, etc.)*

The communities are happier with this approach as they are in greater control of their development processes (Participant 53).

Although environmental management and sustainability is one of the core principles of the GMoU (the 6th principle relates to environmental sustainability and conservation) the communities are yet to implement any projects in this regard. The reason for this is that *most of these communities lack critical infrastructures (participant 55)* so they tend to focus more on this aspect of their needs. They want to be seen to have upgraded in terms of infrastructures. *Some of them (the respondents) also believe that they are going past the age when they have to rely on farming for survival.*

The GMoU approach is potentially beneficial to forest conservation, but the communities have not seen the need to prioritize forest management. The major challenge to the initiative is the desire of the community members to use the money from the initiative to develop *trophy infrastructures such as halls and palaces (Participant 55)*. Little emphasis is paid to environmental management and forest recovery to expand the community economic base.

Among the several benefits that have emerged from the GMoU is that communities were given the opportunity to implement programmes and projects that addresses their crucial needs (participants 53, 54 and 55). Every member of the community is given the opportunity to participate in the decision making for the community projects. Income

activities in the communities has improved and most of the infrastructural activities in the communities are carried out by contractors from the clusters. On the part of the SPDC, *interruption to their activities has reduced significantly, hostility against the personnel has also reduced, and the company is now viewed more as a partner than an oppressor or thief (participant 55)*. There is more peace between the communities and Shell; communities are now fully in charge of their own development.

The GMoU presents a very good prospect for the unprecedented development of Niger Delta communities as it encourages partnership. None of the two study communities have benefited from the GMoU, but it is still in its early days.

6.3.4 Forest Policy and conservation results from the stakeholder forum

Forest policies were discussed at the forest stakeholders' forum (full report is in Appendix A of this thesis). Policies and institutions are a major component in the livelihoods framework (see section 2.3.1); the type of policies and their implementations have effects on livelihood strategies and outcomes of the forest-dependent rural dwellers; it determines what survival options are available to the people. Policies have the power to either reduce people's vulnerabilities (by mitigating against the shocks and trends) or further expose the people to it. Policy therefore has the power to either make them achieve their livelihood outcomes or not. Schoneveld (2014) talked about how shift in policies affects forest resources conservation.

The stakeholder forum (see 3.2.9) stated that *there is a conflict of interest between people's source of livelihood and exploration for crude oil: while the people depend on their forest for survival, the government wants the money that accrues from crude oil exploration*.

It was also said that *oil exploration companies are given licenses to operate even within forest reservation areas not minding the attendant pollution and loss of biodiversity*. Part of the recommendation includes that *Government needs to set special operating rules for the oil exploration companies if they must be allowed to operate within*

designated forest reservation areas because the effect of environmental pollution could last for several years (Table 6.1).

Regarding the community policies, the forum agreed that community laws are generally effective (where they exist) but that government laws have been ineffective (Table 6.1). The forum stated that Government has put the structures and policies in place but lacks political will to implement. Some of the reasons given during the forum discussions included: no working tools e.g. operational vehicles; poverty which means that people do not respect the laws that govern the conservation areas; lack of alternatives to the use of forest resources; lack of enlightenment; inadequate and ineffective legislations to regulate oil companies' activities; and lack of continuity in policy implementation due to changes of policy officers.

The forum suggested some ways forward, these included that: (i) *there should be the sharing of royalties between host communities and the government;* (ii) *encouragement of multiple land use system;* (iii) *regular stakeholder meetings and environmental education;* (iv) *policies should be reviewed to make them effective;* (v) *relevant international laws should be domesticated in Nigeria;* (vi) *special conditions should be set for oil exploration companies operating in forest areas, and;* (vii) *that oil exploration companies should develop new technologies for accessing the oil without damaging the ecosystem.* See Table 6.1. [These recommendations from the stakeholder forum are similar to those stated for Ethiopia and Malawi i.e. the communities should be allowed some benefits. It is in conformity with the recommendations of Agrawal and Ostrom \(2001\) and Ostrom \(1990\) that communities should be allowed to derive benefits from the forest, especially to make a collaborative forest management arrangement to work.](#)

Table 6.1. Some themes discussed in the plenary session of the stakeholder forum conducted in Yenagoa on 4th December 2014

S/N	Themes	Forum's Conclusions
1	Forest policy / conservation <ul style="list-style-type: none"> • Effective community laws • In-effective government laws 	<ul style="list-style-type: none"> • Agreed that community laws are generally effective (where they exist) but that government laws have been ineffective • Government has put the structures and policies in place but lacks political will to implement • Reason for ineffective government policies: <ul style="list-style-type: none"> ○ No working tools ○ As a result of poverty, people do not respect the laws that govern the conservation areas ○ Lack of alternatives to the use of forest resources ○ Lack of enlightenment ○ Inadequate / ineffective legislations to regulate oil companies activities ○ Lack of continuity in policy implementation due to changes of officers • Suggestions on ways forward: <ul style="list-style-type: none"> ○ There should be the sharing of royalties between host communities and the government ○ Encouragement of multiple land use system ○ Regular stakeholder meetings and environmental education should be done ○ Policies should be reviewed to make them effective ○ Relevant international laws should be domesticated in Nigeria ○ Special conditions should be set for oil exploration companies operating in forest areas ○ Oil exploration companies should develop a new technology for getting the oil without damaging the ecosystem

6.4 Discussion

6.4.1 Appraisal of the various policies aimed at forest management

In the Nigerian Constitution (FGN, 1999), legislative and administrative powers are divided amongst three tiers of government, that is, the federal, state and local governments. Under this arrangement, the Federal Government exercises *exclusive* legislative and administrative powers in matters listed in the *Exclusive Legislative List* (FGN, 1999). Included in the *Exclusive Legislative List* are matters related to forest use and management. Under the constitution, the local government councils and the state governments are required to jointly participate in the development of agriculture and forests in their states. The implication of this is that the three tiers of government are, at least in theory, appropriately involved in the administration or management of forests in the country. They therefore are responsible for maintaining the administrative structures that are relevant to the attainment of goals set for the conservation and sustainable use of forests (FGN, 1999; ND-HERO, 2006).

Thus, forest administration is managed through federal and state agencies and departments, such as the Federal Ministry of Environment and state ministries responsible for agriculture, water resources, and the environment (Amoru, 2000; ND-HERO, 2006). The Federal Ministry of Environment is required to formulate and supervise the implementation of all national policies and programmes concerning the conservation of forests. The federal and state ministries of agriculture and environment are responsible for the establishment and maintenance of national and state forest reserves, zoological gardens, and wildlife parks, and for *in-situ* and *ex-situ* biodiversity, soil and other environmental conservation activities.

However, whilst theoretically, the administration of forests should be carried out mainly within the administrative structure provided by the various government ministries and agencies, in practice, most of these structures have not functioned effectively in implementing government conservation policies and programmes. This is largely due to bureaucratic bottlenecks, corruption, inadequate funding, under-staffing, lack of appropriate knowledge, and insufficient commitment to service on the part of public servants (Amoru, 2000; ND-HERO, 2006). A further and important defect of the

administrative system is the exclusion of local government councils, local communities, and non-governmental organisations. This has led to the alienation of these institutions, preventing them from any involvement in the conservation and management of Nigeria's forests (Amoru, 2000; ND-HERO, 2006; Jasper and Abere, 2010).

In the pre-colonial period (before the early 19th century), communal life was primarily rural and the people lived their lives as fishermen, hunters, or craftsmen (Alagoa, 1999; Alagoa and Kiebel, 1999). There were no direct policies regarding forests conservation, but local people had strong ties with their forest lands, and developed various traditional practices based on taboos, tenure systems, and customary rules that regulated the exploitation and use of forests (LENF, 1998; ND-HERO, 2006; Anwana *et al.*, 2010; Nwosu and Anwana, 2013). Thus, embedded in these traditional lifestyles, rules, regulations and practices were underlying policy objectives that indirectly ensured a relatively sustainable exploitation and use of forests.

During the colonial era (early 19th century upwards), the nation's policies on forests conservation centered mainly on the setting aside of portions of community forest lands as reserved and protected forests under the control of colonial forests departments. This did not consider the interests of the community stakeholders (Amoru, 2000). The aim of the colonial forest reservation policies was not to achieve sustainable management but to secure supplies of timber for colonial infrastructure and export (Amoru, 2000; ND-HERO, 2006). While restrictions were tightened in and around the few reserved and protected forests, denying local people any right of use, access, or ownership, the vast majority of unprotected forestlands were left open to uncontrolled exploitation.

After independence (1960), the country had no significant policy on management of forests until 1989 when the National Policy on the Environment was adopted (ND-HERO, 2006). The policy recognised and advocated the need to balance development with sustainable production of the forest resources. It accordingly prescribed the adoption of strategies such as, the regulation of forest activities, the protection of biodiversity (which aimed particularly to protect endangered flora and fauna),

establishment of more forest reserves, national parks, and game and wildlife reserves, in order to achieve conservation and sustainable use of forests.

Since adoption of national policy on environment, successive governments at both the federal and state levels have attempted to implement various regulatory and administrative measures, and programmes, that have, without tangible success, aimed to enhance conservation and sustainable use of forests in the country (Amoru, 2000; ND-HERO, 2006). Such measures included the introduction of a new policy on land use and management systems as well as the establishment of a number of national parks (e.g. Yankari National Park, Kainji Lake National Park, and Old Oyo National Park), annual nation-wide reforestation and tree planting campaigns, and the enactment of various laws against environmental pollution and trading in endangered species.

Some of these various efforts include:

(A) At the federal government level:

The federal government has made several policies in this regard but those relevant to natural resources conservation include:

- i. “The Natural Resources Conservation Act 1989”
- ii. “Federal Environmental Protection Agency Act (Chapter 131, Laws of the Federation, 1990)”
- iii. “The Environmental Impact Assessment Act (no 86 of 1992)”
- iv. “Endangered Species (Control of International Trade and Traffic) Act 11 of 1985”
- v. “The National Parks Decree (Decree No 36 of 1991)”

(B) At the state government level:

The laws and policies that are set at the federal government level are domesticated at the state government level. By this, each of the 36 states (and the Federal Capital Territory, Abuja) that make up the Nigerian Federation have laws similar to that of the federal government to regulate natural resources issues at their respective states. For example, among the efforts of the Bayelsa state government in this regard, is the establishment of six forest reservation areas: the Taylor Creek forest reserve; the Edumanom forest

reserve; the Nun River forest reserve; the Apoi Creek forest reserve; the Igbedi Creek forest reserve; and the Ikibiri Creek forest reserve (Abere and Jasper, 2011).

(C) At the local government councils level:

This tier of government is the closest to the rural dwellers and should have been more relevant in policy issues regarding conservation of forest resources. But unfortunately, they are not efficient (Amoru, 2000; Axel and Ezenwaka, 2004; ND-HERO, 2006).

(D) At the community level:

The community rural dwellers are the main utilizers of the forest resources; their livelihoods depend greatly on the forests. It is interesting to note that, policies aimed at conserving forest resources exist also at the community level. Ezenwaka & Abere (2010) stated that the rural dwellers have strong attachment to their forestlands. As a result of this, they have developed ingenious forest use solutions, based on extensive local knowledge and ways of conserving forest resources. ND-HERO (2006) listed some example of these traditional / customary forest conservation practices as:

- i. “the dedication of certain resources to deities which then insulates such resources from human exploitation”. Example of this was found in Akpide where crocodiles are deified. As a result of this practice in Akpide, this species stands protected to the extent that if it is killed, it must be buried with the same burial rights as for humans, in that community. Nwosu *et al* (2013) and Anwana *et al* (2010) also confirmed this belief system in the Niger Delta.
- ii. “the restriction of exploitation of forest resources to specific days of the week or seasons of the year”. This example was found in Akpide and Akipelai communities during the field survey. In Akpide, fishing can only be done every three years in the following lakes: Esiribi, Ayuu, Eremini, Puro, Mowei, Asemini and Kilapuro (although the youth have modified this rule to two years presently). In Akipelai community, felling of trees and farming are prohibited in the *eledum* forests while fishing in the *obatubo* creek is restricted to every four years.
- iii. “the adoption of agricultural practices like shifting cultivation”

- iv. “the adoption and strict enforcement of customary rules concerning land rights and exploitation of forest resources”
- v. “the adoption of licensing regimes (payment of a stipulated amount) for non-natives who wished to engage in the exploitation of forest resources in the community”. Both Akipelai and Akpide communities confirmed this licensing system. The amount is not fixed; it changes from time to time and depends on current situations.

6.4.2 The effectiveness of government policies

The result from the urban, rural and key informant interviews undertaken during this research shows that government policies on forest resources conservation have failed to produce the desired result (see Section 6.3). Among the various challenges identified during interviews with the Forestry Department were funding and bureaucratic bottlenecks (see Appendix C). Officers at the Forestry Department were however optimistic that the recent upgrade of some of the Bayelsa State’s forest reserves to the status of national parks could mean better funding and management (this upgrade of the forest reserves to the status of a national park was done in 2014). Amoru (2000) suggested that other reasons for failure could be because the interests of the rural dwellers were not considered when the forests were constituted into a reserve; Guthiga, (2008) and Ameha et al, (2014b) had similar views. The non involvement of the rural dwellers in the processes of setting up the forest reserve is enough reason to cause illegal tree felling and poaching within the forest reserves because the forests have always been their source of livelihoods. Ezenwaka & Abere (2010) suggested that an inclusive process of setting up the reserve could yield better results.

The essence of the policies was to conserve the forest resources. Table 6.2 shows the perception of rural and urban dwellers on abundance or otherwise of the forest resources. On average, 69% of the respondents thought that forest resources were threatened and another 26% (average) thought the forest resources are simply declining. On average, only 5% responded that the forest resources are still in abundance. It is important to mention that the respondents that stated that the forest resources were still in abundance were urban dwellers. All the rural dwellers either felt the resources were

declining (30%) or were already threatened (70%). This may be because the rural dwellers are closer to the forests and survive by using forest resources. Thus, the rural dwellers have local knowledge of how the resources used to be, in comparison with the current situation. During the interviews with the respondents in Akipelai community, it was stated and confirmed by all respondents in that community that some local staple food crops such as *amasi* have become extinct. [The conviction of the rural dwellers that the forest resources are declining and some are already threatened is supported by some previous researches e.g. Okojie \(2007\); Oyebo \(2006\); FAO \(2005\); Phil-Eze & Okoro \(2009\); Osemeobo \(1988\) and Ravilious *et al* \(2010\).](#)

Table 6.2. Status of the Niger Delta forests

Respondents	Abundant (%)	Declined (%)	Threatened (%)
Rural dwellers (n = 50)	0	30	70
Urban dwellers (n = 40)	10	23	68
Average	5	26	69

Also during the interviews, knowledge of the existence of the various efforts being undertaken for forest conservation was tested. Respondents/participants were asked if they were aware of efforts / actions of government or of community aimed at conserving the forest resources. This result is shown in Table 6.3. Half (50%) of the urban respondents acknowledged government efforts to conserve forest resources whilst no rural participant knew of any government efforts to manage the forests. It is particularly surprising that no community participant (0%) from either Akpide or Akipelai knew that their community forests were part of a government forest reserve (Akpide is situated in the Taylor Creek forest reserve and Akipelai is in the Edumanom Forest reserve). One reason for this difference in awareness between the rural and urban respondents may be because of the greater access to information (Smith & Lenhart, 1996), through radio, television and print media, enjoyed by urban dwellers, whereas community people have relatively poor access to the media and therefore to information. The rural communities did not appear to know any of the government extension officers who are supposed to disseminate information to the rural areas. This result is similar to that of Adekunle *et al* (2011) in South West Nigeria where they found that only 1% of respondents were aware of any government programme aimed at conserving environmental resources.

On the other hand, only a quarter of the urban respondents (25%) were aware of the role of community institutions and rules in managing the forests, whilst unsurprisingly, all the rural dwellers (100%) were able to identify and describe how community institutions and policies could be used to regulate forest use. The community people were able to mention names of lakes and forests that are conserved through community laws and also consequences of failing to keep the laws. A quarter (25%) of the urban respondents were not aware of any efforts either by the government or the communities in conserving forest resources.

Table 6.3. Awareness of effort(s) at conserving the forest resources

Respondents	Government effort (%)	Community effort (%)	None (%)
Rural dwellers	0	100	-
Urban dwellers	50	25	25

It was important to find out what the respondents thought about the importance of the forest and if it was necessary to carry out conservation measures. Table 6.4 shows this result. All respondents (100%), from the rural and urban centers agreed that the forests were important and should be sustainably managed. All respondents also agreed to a partnership and collaborative forest management strategy that would assist in this regard (see Box 7.1). [This result is not surprising; earlier sections \(4.3.1 and 4.3.2\) of this thesis has affirmed the importance of the forest to the livelihoods of the people.](#)

Table 6.4. Is the forest important and should be sustainably managed?

Respondents	Yes (%)	No (%)
Rural dwellers	100	0
Urban dwellers	100	0
Average	100	0

6.4.3 The effectiveness of traditional conservation institutions

While government conservation initiatives have failed to achieve the intended results, community initiatives have been successful where they exist. Forest resources in traditionally preserved areas, such as sanctuaries, are protected. These sanctuaries are

also known as “evil forests” or “sacred forests” (Amoru, 2000; LENF, 1998; Nwosu and Anwana, 2013; Anwana *et al.*, 2010).

Akpide and Akipelai communities have well defined and respected community laws that protect certain environmental resources. For example, fishing is regulated in the Akpide lakes and timber harvesting is prohibited in some (*eledum*) forests in Akipelai. Fishing is regulated in the *Obatubo* creek in Akipelai. Crocodile is deified in Akpide. These community strategies have been successful in preserving the intended resources (LENF, 1998).

The interviews with rural dwellers showed that local communities respected traditional laws and obeyed traditional rule (section 6.3.1), which governed the harvesting of forest and wildlife resources. In many respect, these were part of local custom. Community laws in this research were widely known and understood by community respondents; 100% of rural respondents and even 25% of urban respondents attested to knowing of the existence of such laws Table 6.3.

Conservation organisations in many parts of the world have recognized that traditional community rules and practices can be highly effective (ND-HERO, 2006). Although the community rules are location-specific, they have been found to be effective where they exist.

6.5 Conclusion and Recommendation

It is evident from the result of this research that a large number of both rural and urban respondents felt that forest resources were declining and in some cases, already threatened. However, the results also show that all the urban and rural respondents wanted forests and forest resources to be properly managed and conserved.

This work also suggested that community (native) laws have been more effective in conserving forest resources than government laws. A limitation however was that such community laws could not be applied outside the communities where they were made. They therefore may only have little effect in conserving forest resources across a larger

geographic area. The effectiveness in conserving forest resources could be enhanced if neighboring communities are to make similar laws.

The potential strength of a government law is in its applicability over larger geographic regions. Government laws could become effective if issues of funding, corruption, and bureaucratic bottlenecks were treated. Rural communities will need to be involved in this process, and their participation is needed to ensure success of the conservation measures (Sudrajat *et al*, 2012; Jasper and Aberer, 2010; and LENF, 1998).

It is recommended that government should carry out a self-appraisal of its policies and that of the rural communities with a view to making the policies more effective. This process could: (i) better equip and provide more funding to the forestry department; (ii) improve communication with the rural communities; (iii) carry out sensitizations and environmental education programmes, and; (iv) provide incentives or alternatives (examples are those of Ethiopia and Malawi) to the rural dwellers in the form of agroforestry schemes, agro-enterprises and trainings in alternative skills for income generation.

Government should also take into account traditional knowledge and traditional and cultural practices compatible with conservation (e.g. as was also mentioned by ND-HERO, 2006), and sustainable forest resource use should be adopted and improved upon.

7 STAKEHOLDER ANALYSIS AND PARTICIPATION

This chapter describes the identification and analysis of stakeholder interest and influence within the Niger Delta forest using the stakeholder analysis tool described by Reed *et al* (2009). It described how data were generated during semi-structured interviews and undertakes a stakeholder analysis using a matrix-based classification of stakeholders into groups and social network analysis to investigate the relationships between stakeholders.

7.1 Introduction and background

The World Commission on Environment and Development (which was set up by the UN General Assembly in 1983) popularized the concept of sustainable development. The outcome was published in a report called “Our Common Future” (Brundtland, 1987); sustainable development was defined as “development, which meets the needs of the present without compromising the ability of future generations to meet their own needs”.

The “sustainable livelihood approach” was a framework, which was utilized by development agencies, such as the Department for International Development (DfID), from the late 1990s. One aspect of the approach was to look at the vulnerabilities of individuals and communities (Morse *et al.*, 2009). Singh and Wanmali (1998) identify that sustainable livelihoods is an approach to enhance resource productivity, secure ownership of and access to resources and income-earning activities, as well as ensuring adequate stocks and flows of food and finance to meet basic needs.

The ecosystem services (see section 2.3.2) and the livelihood (see 2.3.1) frameworks highlight that the natural environment provides benefits to people that enhance livelihoods and well-being. Hence it is anticipated that degradation of the ecosystem can either directly or indirectly affect the flow of services and thereby human well-being (MA, 2005; IISD, 2009; Dieudonne, 2001). However, maintaining the sustainable supply of ecosystem services now and in the future may not be achieved except with full and active participation of all relevant stakeholders (Sudrajat *et al*, 2012; Grimble and Wellard, 1997; Grimble and Quan, 1993; Grimble *et al*, 1994; Jasper and Abere,

2010; LENF, 1998; MA, 2005). Ezenwaka (2002) argues that development simply does not work for people unless it is conceived and realised by them.

Stakeholders have been described as “individuals, groups or organisations with an interest in, and who derive potential benefit or loss from a change in ecosystem services” (Graves *et al*, 2009), they are classified by Grimble *et al* (1997) as those who “affect” (determine) a decision or action, and those “affected” by this decision or action either positively or negatively; those who are “active” or “passive” stakeholders. Turner *et al* (2005) and Reed *et al* (2009) classified stakeholders according to level of “interest” and “influence”. For this thesis, the word interest was used to mean ‘positively inclined to a sustainable management of the forest resources’ while influence was used to mean ‘the power and will to cause a change or a difference’.

The need for stakeholder participation and analysis is necessary for the success of any project (Jasper and Abere, 2010; Ezealor, 2006; MA, 2005; Brugha & Varvasovszky, 2000). Graves *et al* (2009) stated that there are signs that forests valuation is evolving to include “more deliberative *participatory methods* and that international and national development agencies are also showing much interest in forests and ecosystem services valuation which reflects greater commitment to *citizen participation* and to policies that promote social and environmental, as well as economic outcomes”.

Policies, laws, institutions and markets that have been developed through a participatory process (in which relevant stakeholders have been involved from the conceptual stages) are more likely to be more effective (MA, 2005). The participation and contribution of the stakeholders enhances understanding of benefits and also of any likely negative impacts of such policies (MA, 2005); further, one of the most intractable problems of ecosystem management have been the lack of alignment between political boundaries and units appropriate for the management of ecosystem goods and services. Stakeholder participation and analysis is a key element of forests and ecosystems services valuation (Graves *et al.*, 2009).

However, Grimble *et al* (1994) noted that merely increasing the participation of stakeholders cannot guarantee that projects will succeed but that stakeholder analysis is critical i.e. an analysis of their interests and levels of influence or importance. He stated further that for projects to work, the interests of the whole range of stakeholders who can influence or be influenced by the project or policy need to be taken into account, and compromises need to be actively sought between *public* objectives and potentially conflicting *private* stakeholder interests and objectives. Thus, stakeholder analysis has been developed in response to the challenge of multiple interests and objectives, and particularly the search for efficient, equitable and environmentally sustainable development strategies (Grimble *et al.*, 1994).

The importance of stakeholder analysis in forest management is that it helps to reveal that most natural resource management issues are characterised by a complex web of interests and trade-offs between the stakeholders, such as local people, government departments, national and international planners, and professional advisers. For instance, Obot (2006) gave an example of how different people view the same piece of forestland in the Niger Delta: a source of foreign exchange; a place to hunt wild animals or fish for food and collect firewood and other non-timber forest products (NTFPs); a site for recreation and education; a potential site for gaining international carbon credit; an area for water source protection; a site for a new settlement; a nature reserve to protect biodiversity; a place to find new species or a source of timber. Stakeholder analysis is critical in helping to identify these interests amongst stakeholders (Grimble & Wellard, 1997) in order to assess and compare inherent conflicts, synergies, and trade-offs. Through the use of participatory methods and conflict management, as well as pro-active facilitation of communities with government and the private sector, conflicts over conservation interventions have the potential to be diffused, both on a global and local scale (Isoun, 2006).

The objective of this chapter is to identify the Niger Delta forest stakeholders and analyse their interest in and influence over the forest ecosystems with a view of creating mutual understanding and forging cooperation amongst the identified stakeholders towards a more sustainable management of the Niger Delta forests.

7.2 Method

The method adopted in this chapter followed the approach described by Reed *et al* (2009). The approach is based on a descriptive and normative rationale and it comprises three key phases and six steps (Figure 7-1). The descriptive rationale has its use in describing the relationship between a particular issue and its stakeholders (Donaldson & Preston, 1995) while the normative rationale is stakeholders with varying interests in a common subject matter, coming together to discuss their different interests with a view to building consensus or agreeing on a way forward (Habermas, 1984, 1987; Checkland, 1999; Roling, 1996). The stakeholder forum and the semi-structured interviews (as discussed in Chapter 3) contributed to the development of this chapter. As described in section 3.2.9, there were 19 participants in the stakeholder forum. These were six people from rural communities, six people from government, three people from “other” organisations, three people from academia, and one person involved in legislation.

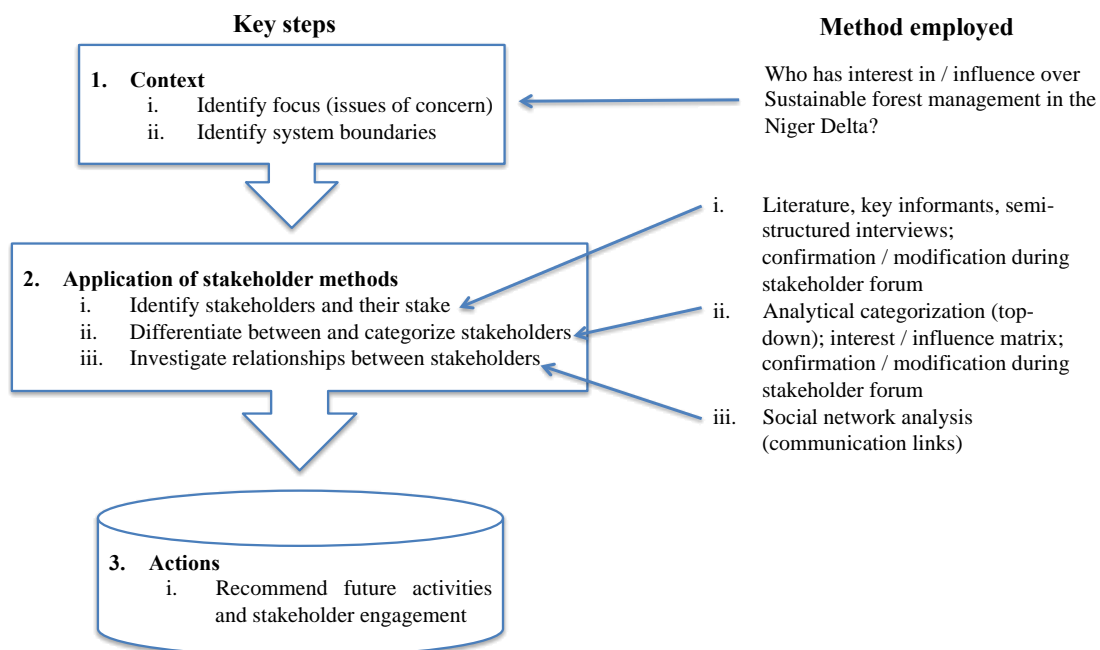


Figure 7-1: Method applied in identification and classification of stakeholders (after Reed *et al*, 2009)

Some explanations on the Figure 7-1:

In step 1, the 'key outcome' for the stakeholder analysis was identified. This, in other words, refers to what the analysis is aiming to achieve. Before stakeholders can be identified, a starting point is the identification or determination of what the issue of interest is (Reed *et al*, 2009). It is after this has been done, that other methods can be applied to identify the stakeholders as concerning that issue of interest. In this case, the key outcome was framed as a question, in terms of who had "interest in" and "influence over" sustainable forests management in the Niger Delta. The issue of interest was the sustainable management of the Niger Delta forests.

In step 2, the boundaries of the socio-ecological systems were identified. The boundaries of the socio-ecological system can vary depending on what component of the system is being considered, and its relevance to stakeholders on the local, national or regional scale. In some case it is possible for example, that the scale of the physical dimensions of the system and its impact are local, but stakeholders at the national or even regional scale may be implicated. It can be difficult therefore to include all possible stakeholders that there may be, and this necessitates the identification of a system boundary, drawing a cut-off line to ensure that the very essential stakeholders are identified. This can only be done, using appropriate criteria (Clarke and Clegg, 1998) depending on the focus of the analysis, for example, geographical criteria, such as boundary of a forest reserve. Here, the Niger Delta became the boundary.

In step 3, after the key desired outcome and the boundaries of the socio-economic system were identified, the process of identifying the stakeholders commenced. In practice, this is an iterative process (Reed *et al*, 2009); stakeholders were initially identified through the literature, key informants, and through semi-structured interviews. The initial results developed through this process were further subjected to debate and confirmation or modification during the stakeholder forum. The stakeholder forum was used as a sounding board to determine whether any stakeholder group had been omitted. The key outcome that was used to identify the socio-ecological system boundaries, was the same as used during the initial phase of the work - "who has interest in and influence over sustainable forest management in the Niger Delta".

In step 4, the identified stakeholders were differentiated and categorized using an analytical categorization (top-down) method. Information from the various interview sessions was then initially used to develop an interest and influence matrix. This output was presented to the stakeholders during the stakeholder forum for scrutiny and review. A ranking of 1 to 10 was adopted to generate scores; 1 being the lowest and 10 being the highest interest or influence. This was further analysed using the RELU-birds stakeholder analysis tool (Graves *et al.*, 2014). The stakeholders were then classified as “subjects”, “key players”, crowd or “context setters”. These classifications helped in deciding how to involve the stakeholders and how they could be engaged in discussions concerning future policy formulations (Graves *et al.*, 2009; Bryson, 2004).

In step 5, the relationship between the stakeholders was analyzed using the social network analysis (SNA) method. The SNA uses matrices to organize data in order to show relational ties that link the stakeholders together (Reed *et al.*, 2009). The matrices according to Reed *et al.* (2009) could represent a unique relationship e.g. communication, advice, trust, conflicts and these data could be gathered through structured interviews, questionnaires or observations (Wasserman and Faust, 1994). This analysis showed the structure of the stakeholder network and helped to identify which of the stakeholders was more central or marginal (i.e. maintains more links or less than the other stakeholders in the network). This also shows how stakeholders are clustered together. Stakeholders that maintain strong links with each other are able to influence each other (Newman and Dale, 2005; Crona and Bodin, 2006). For this research, their communication links were examined i.e. who talks to who and how much interest and or influence do they have over the forest resources? The strength of their communications was classified as either strong, medium or weak. The table that shows this result is contained in the stakeholder forum report in Appendix A and

Table 7.3. The qualitative outputs are written as text while the quantitative outputs are shown in graphs and figures.

7.3 Results and discussions

7.3.1 Identification of stakeholder interest, influence and communications

The identified stakeholder groups include the oil exploration companies; the government, the rural dwellers, the urban dwellers, some international organisations (such as the UN, USAID, DfID, EU, and the World Bank), some local environmental Civil Society Organisations, the academia and research institutions, and wood-based industries. The result of the analysis of their levels of interest and influence over the conservation of the forest resources are further discussed in the following sections.

7.3.2 Identification of the key outcome

In this case, the key outcome was framed as a question, in terms of who had “interest in” and “influence over” sustainable forest management in the Niger Delta forest. The focus of the research was the sustainable management of the Niger Delta forests.

7.3.3 Boundaries of socio-ecological system

The physical parts of the Niger Delta socio-ecological system have important local importance, influencing the lives and livelihoods of local dwellers. At the same time, the forests have global resonance as many sites in the Niger Delta are designated as wetlands of significance. There are also wildlife species of IUCN interest in the region e.g. the Niger Delta red colobus monkey (Hilton-Taylor, 2000).

7.3.4 Identification of stakeholders and their stake

The stakeholders were identified largely because of the benefits they could derive from the Niger Delta forest. For certain stakeholders, their stake consisted in the ability to extract resources such as wood, NTFPs or oil from the forest/forestland. For other stakeholders, their stake was defined by the role of their organization, for example, whether this was a political, management, advocacy, or research role.

7.3.5 Stakeholder interest in the key outcome

The stakeholders were ranked according to levels of interest in and influence over the sustainable management of the forest ecosystem services (Table 7.1). The justifications for the scores are also provided in Table 7.1.

Factors that could motivate stakeholders to have interest in the defined outcome of sustainable forest resources management include “livelihoods and economic benefits” accruable from the forest to rural dwellers (Aheto *et al*, 2016; Musyoki *et al*, 2016). Levels of interest are also defined by organizational role, and the synergy between this and the key outcome.

The stakeholder forum concluded that the oil exploration companies have no interest in conserving forest resources because *their main focus is on profits from oil explorations*. The forum gave oil companies a low interest score of 1.

The forum also concluded that although the government (Federal government) had *created many policies to protect forests and signed up to many international conventions, it is just a show-off because some of these actions are due to pressures from foreign governments*. The forum held that the government has *very limited ability to implement policy; lacks political will; are corrupt and more concerned about profits from oil exploration activities*. Hence from this combination of factors, the forum gave the government a score of 2 for their level of interest.

The forum scored the local NGOs 9 points on level of interest because they *have been funding conservation efforts and building capacities of local people*. The rural dwellers had the maximum score of 10 because *their survival is over 95% dependent on the forest resources* and as such, have high interest in its sustainability.

The urban dwellers were given a score of 5 because the forum held that *their awareness about global warming has increased their interest in forest conservation*. The forum ranked the interest of the foreign organisations such as the UN as 9 because *they are champions of environmental conservation matters globally*. The academia and research

institutions scored 8 points on interest because the forum held that *they are informed and appreciates the functions of the forest* and that *they educate people on best practices*. The wood based industries had a score of 2 because *their interest again is in their profits from the business and not conservation*.

7.3.6 Stakeholder influence

The government was identified as having the highest influence (9.5) over forest ecosystem services. In the stakeholder forum, those present debated and concluded that the government, being the policy formulator and implementer, wields the highest influence over forest ecosystem services although at the moment, this influence is not being felt because of a lack of political will. The forum concluded that *the government has all the machineries needed to make the difference if there can be a political will*. This conclusion of the forum is in line with that of Paletto *et al* (2016) that concluded in a study in Italy that public administration, as a stakeholder group, has the most power in all forest management issues.

The oil exploration companies and the international and foreign agencies were ranked next to the government in level of influence (with a score of 9). The *large financial resource* at the disposal of the oil exploration companies (equivalent to 95% of Nigerian exports) allows them to have political power and influence.

The influence of the foreign and international organisations is in their *ability to influence member states*, especially those that have signed up to some international conventions.

Each of the other local stakeholder groups was given influence scores below 5. For the local NGOs, the forum held that their *influence is limited to advocacy and cannot make any national policy changes; their influence is on a small scale, usually local and not national* and that *such influences hardly continues after the exit of the NGO*. For the rural dwellers, the forum held that *they possess no financial, human, or physical capitals; they lack any strong external social networks* and therefore have *no power to affect policy or influence the oil companies that ravages their environment*. For the

urban stakeholders, the forum held that *they are not formed into any coalition; just lone voices* so cannot influence policy. For academia and research institutions, the forum felt that they *may be able to influence individuals but not systems (policy) because of lack of political power; teachings ends up in the class rooms and research outputs ends up not being implemented*. For the wood industries, the forum considered that these group were only interested in *profits*.

Table 7.1. Stakeholder interest and influence analysis matrix in relation to sustainable forest management in the Niger Delta as determined by the forum

No	Stakeholder	Justification for level of interest	Score for level of interest	Justification for level of influence	Score for level of influence
1	Oil exploration companies	Main focus is on profits from oil exploration	1	Large financial resources	9
2	Government	Although has created many policies to protect forests and signed up to many international conventions; this is just a show off; some of them are due to pressures from foreign governments; Very limited ability to implement policy, lack of political will, corruption, more concerned about profits from oil exploration activities	2	Government has all the mechanisms needed to make a difference if there can be a political will	9.5
3	Local Environmental NGOs	Have been funding conservation efforts and been building capacity of local people on conservation	9	Influence is limited to advocacy; can't make any national policy changes, influence is on a small scale (usually local and not national); influence hardly continues after the exit of the NGO	4
4	Rural dwellers	Their survival is	10	They have no power to	1

No	Stakeholder	Justification for level of interest	Score for level of interest	Justification for level of influence	Score for level of influence
		over 95% dependent on the environmental resources		effect policy neither can they influence the oil companies that ravages their environment, destroying their natural capital; no financial power; no human and physical capitals; lacks strong external social network	
5	Urban dwellers	Their awareness about climate change has increased their interest in forest conservation	5	They are not formed into any coalition; just lone voices; can't influence policy shift	1
6	Foreign / International Organisations e.g. UN, USAID, DfID, EU, WorldBank	Champions of environmental conservation initiatives	9	Have the power to influence policy of member or beneficiary countries and multinational oil exploration companies	9
7	Academia & research institutions	They are informed and appreciates the functions of the forest; educates people on best practices	8	May be able to influence individuals but not systems (policy) because of lack of political power; teachings ends up in the classrooms and research outputs / recommendations ends up not being implemented	3
8	Wood based industries	They are interested in their profits from the business and not conservation	2	Profit oriented	1

7.3.7 Mapping of stakeholder influence and interest

The mapping of stakeholder influence and interest in terms of sustainable forest management in the Niger Delta can be shown graphically (Figure 7-2). According to their locations within the plot, they were grouped as either “crowd”, “subjects”, “key players” or “context setters” (Table 7.2).

Although the government and the oil exploration companies had high levels of influence, they had low levels of interest in forest ecosystem services (scores of 2 and 1 respectively). Only foreign agencies had high scores for both influence and interest. Other stakeholders had high interest in forest ecosystem services but with little influence.

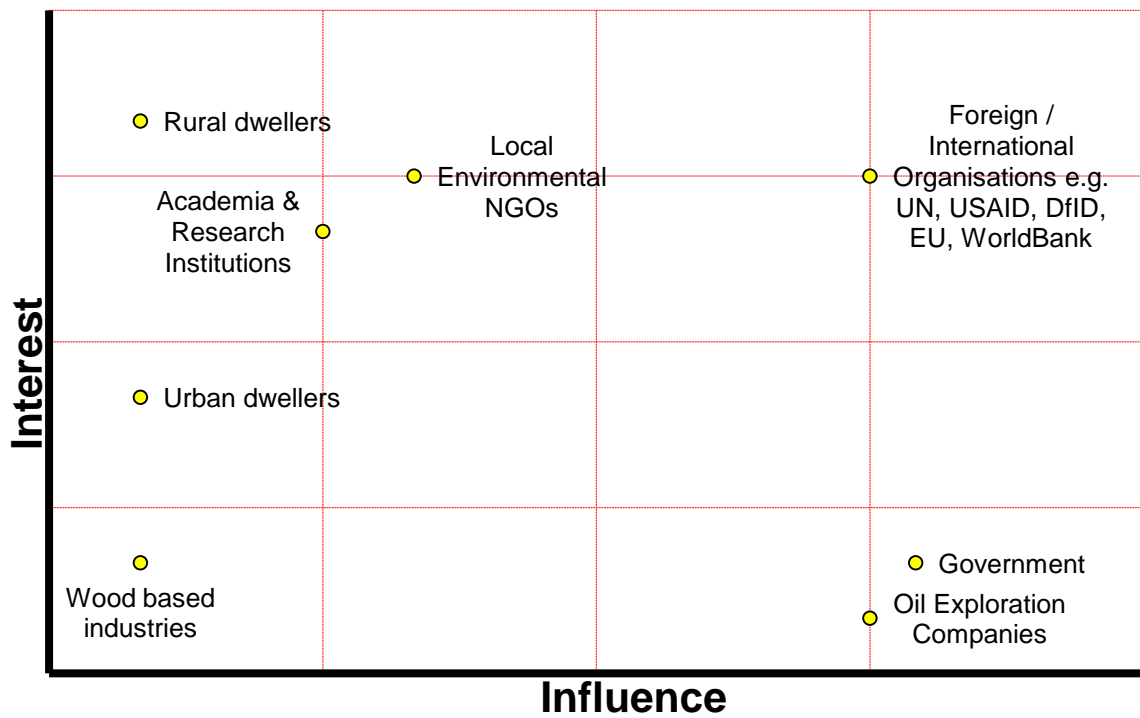


Figure 7-2. Stakeholder classification of interest and influence on sustainable forest management in the Niger Delta.

Table 7.2. Grouping of stakeholders in terms of their interest and influence on sustainable forest management in the Niger Delta

Subjects: Rural dwellers, Local NGOs, Academia & research institutions	Key players: Foreign / International organisations
Crowd: Urban dwellers Wood based industries	Context setters: Government Oil exploration companies

The rural dwellers, local NGOs and academia and research institutions were referred to as the “subjects”. This group, although it had high interest in the forest ecosystem services, had little influence. They were not able to significantly influence policies or what happens to the forests. The foreign / international organisations are by this grouping referred to as “key players” because of their high interest backed by a high influence in sustainable management of the Niger Delta forests. This group was able to cause changes in how the forest is managed. The urban dwellers and wood based industries were here grouped as “crowd”. They had little or no influence on forest ecosystem services and they were of no significance in decision-making (Graves *et al.*, 2009). The oil exploration companies and government were “context setters” in this regard. They wielded influence but had low interest. They were able to influence what happens to the forests.

7.3.8 Relationship between stakeholders

The stakeholder forum was also used to identify the communication links between the Niger Delta forest stakeholders (Table 7.3), which are shown graphically in Figure 7-3 - Figure 7-8. The strength of the communication links is shown in the thickness of the linking lines. Figure 7-3 shows that almost every stakeholder talks to every other stakeholder. In Nigeria, these systems are not so well developed and differentiated. Almost everyone is able to have access to everyone else whenever there is the need.

Greater differentiation is apparent in the ascribed strength of the communication. All the links are weak except between government and foreign agencies and between rural communities and local NGOs. The content of the communications between many of the stakeholders have less to do with forest resources conservation. The forum identified *oil extraction matters, consultancies to execute jobs, negotiations for rights of passage, funding, agitation for benefits, taxation and compensations* as the content of the communication between many of these stakeholders. This further supports the fact of less interest from some of the key players concerning planning for forest resources conservation (as this is hardly part of their communications).

Table 7.3. Communication links for Niger Delta forest stakeholders

No	From	To	Content of communication / justification for scoring on strength of communication	Strength		
1	Oil Exploration Companies	Government	Oil Extraction, Policy & Economic issues	Weak		
		Local Environmental NGOs	Consultancies to execute jobs	Weak		
		Rural Dwellers	Negotiations for right of passage i.e. to enable them do exploration activities	Weak		
		Academia & Research Institutions	Consultancies	Weak		
2	Government	Oil exploration companies	Oil extraction, policy & economic issues	Weak		
		Local environmental NGOs	Policy setting, registration / permission to operate	Weak		
		Rural dwellers	Policy, development, security	Weak		
		Urban dwellers	Policy, development, security	Weak		
		Foreign/International Organisations	International cooperation / bilateral agreements, International conventions	Strong		
		Academia & research institutions	Funding, Policy	Weak		
		Wood based industries	Policy, Tax, Regulation	Weak		
		3	Local Environmental NGOs	Oil Exploration Companies	Funding, Consultancies, Advocacy	Weak
				Government	Funding, Consultancies, Advocacy	Weak
				Rural dwellers	Project implementation, Capacity Building, Community Development, Conflict mediation / Resolution	Strong
Urban Dwellers	Advocacy			Weak		
Foreign/International Organisations	Funding, capacity building			Medium		
4	Rural Dwellers	Oil Exploration Companies	Compensations, Agitation for rights / Benefits, Community Development	Weak		
		Government	Community Development, Chieftaincy issues, Land Boundary issues, Intra & Inter Community Peace / Conflict issues	Weak		
		Local Environmental NGOs	Assistance for community development, mentorship, capacity building, disputes resolution	Weak		

No	From	To	Content of communication / justification for scoring on strength of communication	Strength
		Urban Dwellers	Access to information, guidance in decision making, funding, links to external agencies	Weak
		Wood based Industries	Granting of permission to operate within the local forest, collection of royalties	Weak
5	Urban Dwellers	Government	Advocacy	Weak
		Rural Dwellers	Information dissemination, education / enlightenment	Weak
		Foreign/International Organisations	Advocacy, funding	Weak
		Academia & Research Institutions	Access to information	Weak
6	Foreign / International Organisations	Government	Funding, bilateral cooperation, international conventions	Strong
		Local Environmental NGOs	Consultancies, community development, advocacy, capacity building	Medium
		Academia & Research Institutions	Consultancies, Information	Medium
7	Academia & Research Institutions	Oil Exploration Companies	Research, funding, consultancies, advocacy	Weak
		Government	Funding, advocacy	Medium
		Rural Dwellers	Information extraction for research	Weak
		Urban Dwellers	Information extraction for research	Weak
		Foreign/International Organisations	Funding, consultancies	Weak
		Wood based Industries	Information extraction for research	Weak
8	Wood based Industries	Government	Registration for license, tax payments	Weak
		Rural Dwellers	Negotiation for right of passage i.e. to extract timber from the local forest	Weak

Foreign/international organisations include UN, World Bank, EU, Dfid, USAID

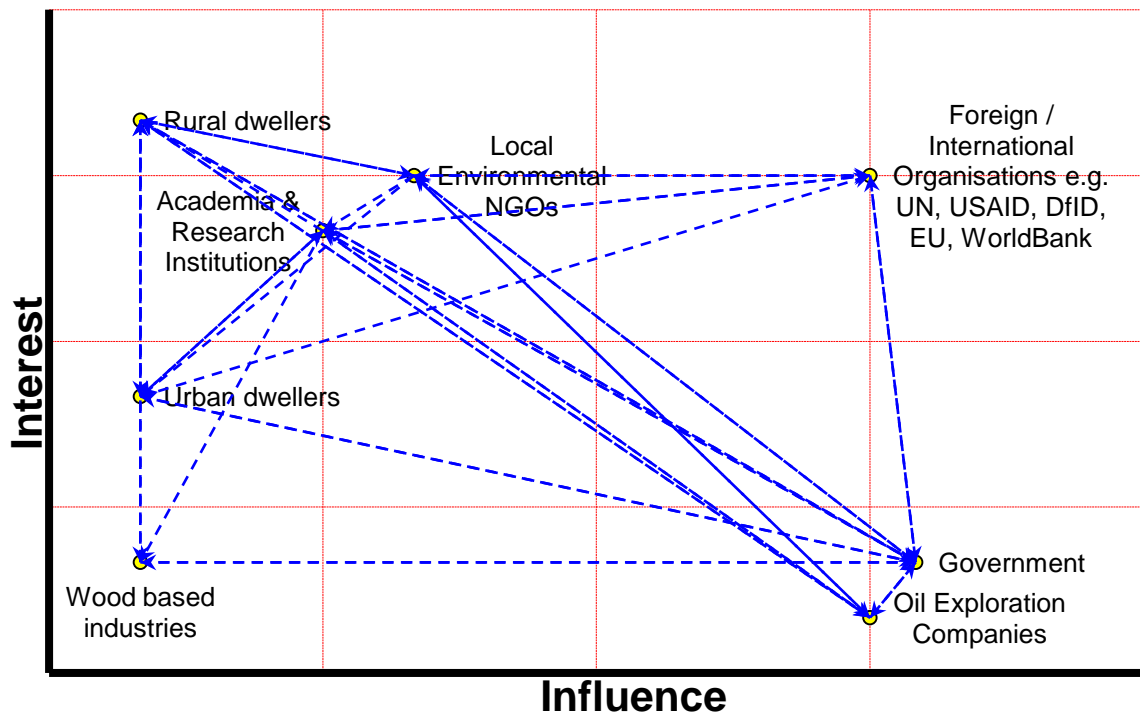


Figure 7-3. Route of possible communication between stakeholders, with stakeholders placed according to their influence and interest in forest management

The output from the stakeholder forum as shown in Table 7.3 was used to do the centrality plot. The centrality plot aimed to show which of the stakeholders was more connected (communication-wise) i.e. which stakeholder occupies the most central part of the communication network? The size of the circle for each stakeholder is a measure of how central it is. This centrality plot, Figure 7-4 shows that government is relatively more central, most likely because government is the centre of decision making and implementation. The plot showed that every identified stakeholder had a link with the government. The strength of such communication links notwithstanding, the presence of the link could be an avenue for further exploitation i.e. it can be strengthened by promoting talks that support forest resources conservation issues.

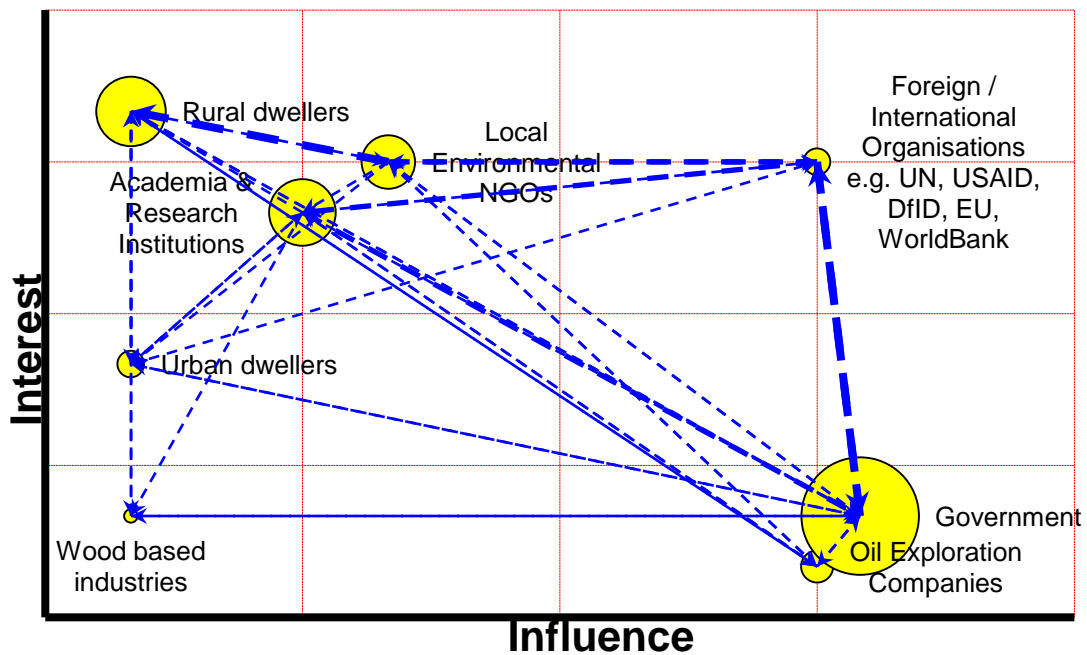


Figure 7-4. Centrality plot (total in & out), which shows how central a stakeholder is in the communication network

The outgoing links from the context setters (Figure 7-5) and their incoming links (Figure 7-6) shows the high level of influence of this group. These organisations are connected with every stakeholder. The figures also highlight the strong strength of communication between the government and the foreign agencies. The strong link between the context setter and the key players can be exploited in favour of forest resources conservation.

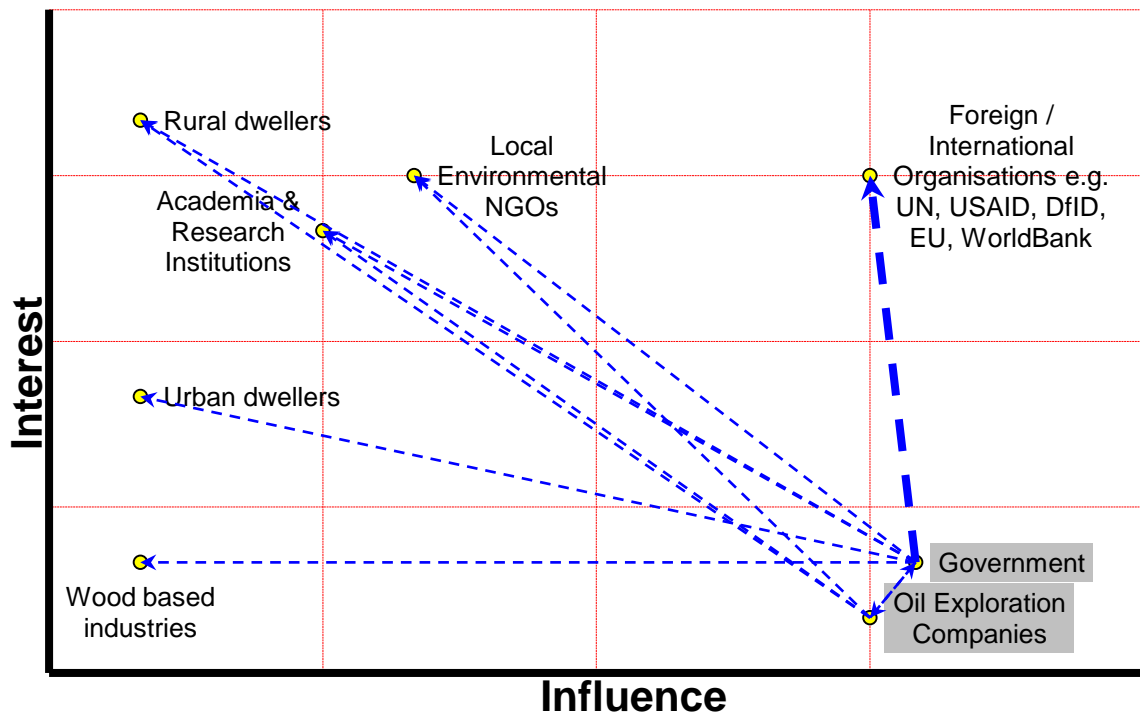


Figure 7-5. Outgoing communication links from “context setter” organisations (government and oil exploration companies). The width of the line indicates the strength of the links as determined by a stakeholder forum.

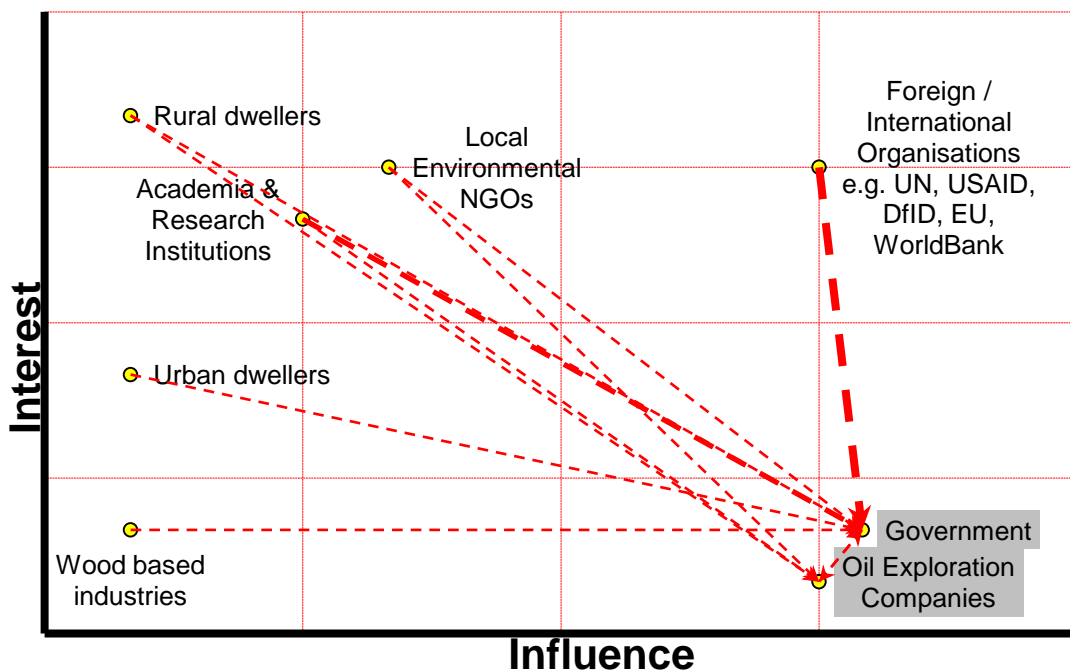


Figure 7-6. Incoming communication links to “context setter” organisations (government and oil exploration companies). The width of the line indicates the strength of the links as determined by a stakeholder forum

Focusing only on the government, the government has outward (Figure 7-7) and inward (Figure 7-8) links with each stakeholder. This presents an opportunity for introducing issues of forest resources conservation and increasing the level of interest of the government.

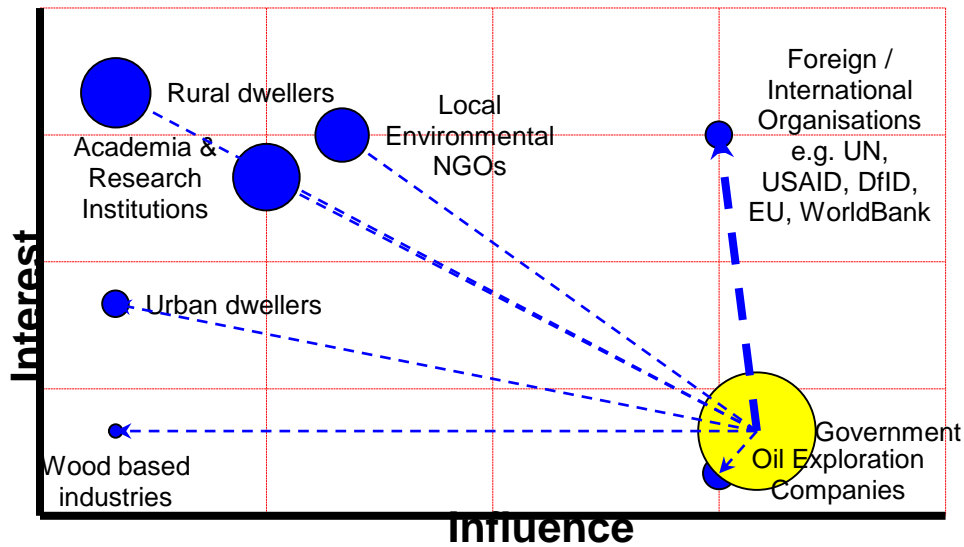


Figure 7-7. Outgoing communication links from the government to other stakeholders. The line width indicates the strength of the links as determined by a stakeholder forum

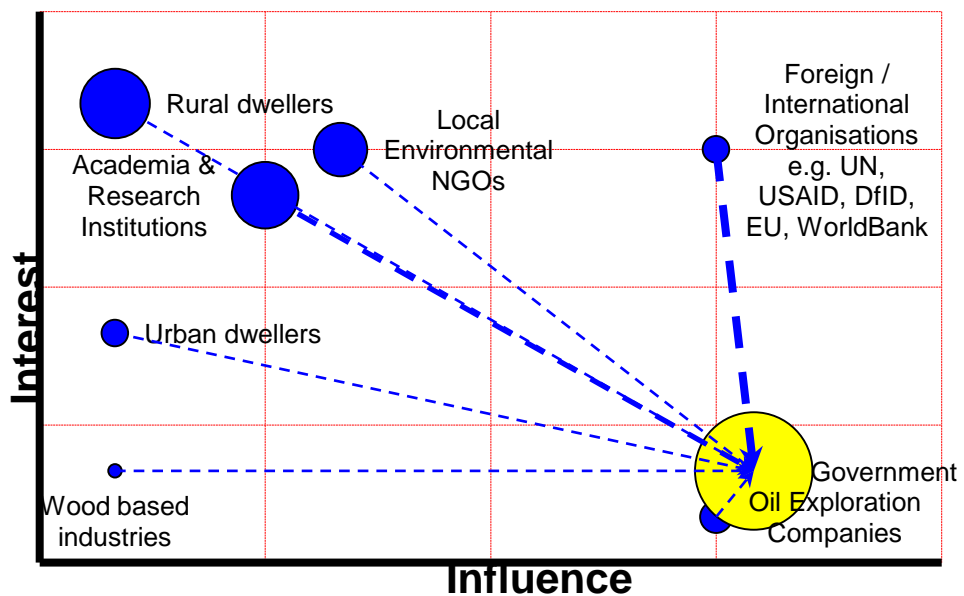


Figure 7-8. Incoming communication links from the other stakeholders to government. The line width indicates the strength of the links as determined by a stakeholder forum

7.4 Possibilities for stakeholder cooperation

This was a theme during the semi-structured interviews and was again supported during the stakeholder forum. All the stakeholders (government, community and the SPDC) were willing to collaborate for the purposes of sustainably managing the Niger Delta forest resources. The community stakeholders said *yes, so far it will be to our benefit (participant 1); we want a better availability of the forest products (participant 31)*. SPDC said *partnering and cooperation with other stakeholders is a key driver and can be used as a tool to maximise resources (participant 53)*. It was confirmed that the Global Memorandum of Understanding (GMOU) is already a policy of SPDC in this regard. But the rural dwellers' principal concern is whether their interests will be taken care of; they do not trust the government, they said *but government can be treacherous (participant 1)*. Their concerns are supported by previous researches which shows that government's concern is usually not primarily that of community's welfare but in protecting forest resources (Mmon and Arokoyu, 2010; Ezealor, 2006; Amend & Amend, 1995; Areola, 2011; Dixon & Sherman, 1991).

Some quotes in relation to this theme are shown in Box 7.1.

Box 7.1. Possibilities for stakeholder cooperation

- *Yes, so far that it will be to our benefit; but government can be treacherous, that is the problem. Participant 1 (also, 21, 20, 11, 9)*
- *We want better availability of the products. If that plan will guarantee it, then it will be welcomed (participant 31)*
- *Partnering and cooperation with other development stakeholders is a key driver and can be used as a tool to maximize resources and establish mutually beneficial interventions where feasible. Participant 53*
- *Presently the concept (GMOU) is partnering with the various state and local governments and is reaching out to other development stakeholders such as NDDC and donor agencies. Participant 53*

7.5 Conclusion and Recommendation

In the Niger Delta, rural inhabitants whose survival and livelihood depend on forest ecosystem services unfortunately have little influence over the management of the

forest. To further compound their vulnerabilities is the issue of the Land Use Act (Act, 1990; Ebeku, 2002; Francis, 1984) that has removed the right of land ownership from the communities and has vested this in government. This same government happens to have little or no interest in the forest resources; their interest is more in crude oil exploration, which provides most of Nigeria's income (see sections 7.3.5 and 7.3.7). The seeming lack of interest on the part of government may be responsible for the weak forest policies and lack of implementation; *failure of government policies to effectively conserve forest resources is reported by many previous researches e.g. Kumar, 2002; Lund & Treue, 2008; Persha et al, 2011; Chukwuone & Okorji, 2008; and Smith & Lenhart, 1996*. The oil exploration companies are interested in maximizing profits from their investments. Their low commitment to the communities in the form of various acts of corporate social responsibilities (e.g. the GMoU) is not enough to alleviate the vulnerabilities of rural dwellers who are at the receiving end of the impacts of exploration activities on the forest ecosystem. *This issue of low commitment to the welfare of host communities on the part of private companies operating within the rural localities is not peculiar to the Niger Delta as the case study on Mozambique shows (see Box 2.1)*.

All the stakeholders are agreeable to partnerships and participation in the sustainable management of the Niger Delta forests (see section 7.4). *But the stakeholders must find a way to guarantee the benefits and interests of all key stakeholders (Bekele & Ango, 2015; Senganimalunje et al, 2015; Agrawal and Ostrom, 2001; Ostrom, 1990; Agrawal and Gibson, 1999; Agrawal et al., 2008; Andersson et al., 2004; Ribot et al., 2006; Somanathan et al., 2009) including the vulnerable groups, such as the subjects i.e. stakeholders must be willing to shift grounds where necessary in order to reach a workable compromise (Grimble et al., 1994) situation; this issue of reaching compromise especially on benefit sharing was an issue in the Tanzanian experience (see Box 2.1)*. On the other hand, the question will be, what kind of a partnership arrangement can exist between a multi-billion dollar oil exploration company and a poor rural community? It is necessary to further discuss roles and responsibilities of each stakeholder in the partnership arrangement.

The present low level of interest of the government needs to be considered. This is important as the government is central to all other stakeholders. They could act as the nucleus for the partnership arrangement. The way forward is to identify ways in which the interest level of the context setters, including the government, could be increased. The foreign agencies could invoke some of the several conventions to which Nigeria is a signatory in order to make the government more involved in the conservation of the forest resources (part of the success story of the PFM in Ethiopia is the involvement of foreign agencies, see Box 2.1); the subjects could also form alliances with each other, which will increase their influence levels. Perhaps a good starting point for this partnership arrangement could be the expansion of the SPDC's GMoU (see Section 6.3.3). In this arrangement, the government, oil exploration company, and the rural community are already functioning as partners. The only challenge is that the community has not seen the need to prioritise forest resources conservation. In this regard, it will be beneficial to develop a framework, which effectively communicates the conservation ideas to the people (Reid *et al*, 2006; Hauck *et al*, 2013; Urgenson *et al*, 2013).

Following from the above, it is suggested that government should revisit and review existing forest policies as well as laws governing forest conservation areas. SPDC should also devise a means of making their host communities prioritise forest conservation in their GMoU projects. The communities and the civil society groups should form alliances to increase their influence level; in doing this, they will be able to become a kind of a pressure group. The communities must also understand and make necessary changes to the ways in which their everyday activities is impacting negatively on the forests.

8 SYNTHESIS

8.1 Summary

This chapter unites the results and discussion of the previous chapters, with the intention of identifying the key conclusions and establishing a way forward in terms of recommendations.

The aim of this thesis was to appraise local community dependency on, and involvement in, forest resources management with other stakeholders in the Niger Delta, in order to develop a framework for the sustainable management of forest resources that includes local communities as a key stakeholder in the process.

In the introduction, the Niger Delta was identified as being endowed with abundant renewable and non-renewable natural resources. The oil and gas resources provide about 95% of the foreign exchange of Nigeria. Although the forests have less financial value to the government, it is established by this research (in chapters 4, 5, 6 and 7) that the forests are very important to the livelihoods of local stakeholders.

The Niger Delta region has been restive since the 1990s mainly because of issues of access to and control over the natural resources; this has affected not only crude oil production but also negatively impacted (and impacting) on the forest ecosystems. By extension, this affects (and is affecting) the livelihoods of the inhabitants; the locals are 95% dependent on resources from their environment for survival ([see section 4.3.1](#)). This research has found that there are efforts being made by stakeholders to resolve the issues ([see section 6.3.1](#)) but there is no synergy, hence most efforts aimed at ensuring the continuous supply of forest ecosystem goods and services are still not yielding results.

8.2 Introduction

Three frameworks were used to guide this research: the livelihoods framework; the ecosystem services framework; and the stakeholder participation and analysis framework ([section 2.3](#)).

The similarity in the three frameworks is seen in their ultimate aim i.e. the wellbeing of the people concerned. The livelihoods framework is concerned with how the source of livelihoods (wellbeing) of the people will be sustainable amidst factors which tend to limit or enhance them; the ecosystem services framework shows how benefits derived or derivable from the environment contributes to the wellbeing of the people; the stakeholder participation and analysis stresses that those concerned or affected by a phenomenon or decision or issue must be involved (also shows how they must be involved) in order to achieve a sustainable development goal and avoid conflicts (see [section 3.2.5](#)).

Different stakeholders in the Niger Delta have different levels of interest in and influence over the forest resources (see [sections 7.3.5 - 7.3.7](#)). The common denominator is that they all have interest and benefits from the forest but at different levels. Their actions or inactions impact on the forest, and the different stakeholders feel the effect differently. This is where the three frameworks for this study have been useful. The livelihoods frameworks helped in analyzing the forest as a source of livelihoods and helped to put the factors which affects its sustainability into context; the ecosystem services framework helped to show what is the focus of or benefit to the stakeholders; and the stakeholder participation and analysis helped in the understanding of what interests and influence each stakeholder group have on the forest resources and ultimately, how to make them work together in a way that ensures understanding and brings about collaborations among stakeholders.

In summary, the three frameworks complemented themselves and were useful analytical approaches in the research. How this can be used in the Niger Delta has been proposed in the concluding chapter of this thesis and in Figure 8-1.

8.3 Summary of findings

The rural Niger Delta people depend almost entirely on ecosystem benefits for their survival (see [section 4.3.1](#)); they have no access to crude oil, but only the forest goods and services. There are little or no alternative sources of employment or of income (see

[section 4.3.2](#)). The dependence of the rural dwellers on the forest for survival has not changed, as no alternative opportunities exist in those areas.

The people's knowledge of the range of ecosystem benefits is limited. They are mostly aware of such benefits that are directly related to their livelihoods ([see sections 5.3.1 and 5.4.1](#)).

The forest resources are in a constant state of decline; some are already extinct while some others are threatened already ([see section 4.3.3](#)).

Stakeholders are making efforts aimed at conserving the forest resources but are acting separately; there is no synergy ([see section 6.3.1](#)). In many of the cases, stakeholders are not aware of what the other is doing. The existing efforts aimed at conserving the forest resources are therefore not effective. The forest management approaches such as community traditional approaches ([see section 6.4.3](#)), are very effective where they exist, but limited in influence only to their communities. The government laws and policies of setting aside forest reserves, which is supposed to have influence over a larger geographic area, is largely ineffective ([see section 6.4.2](#)). The present forest management approach is top-down by the government.

Stakeholders that have high interest in the conservation of the Niger Delta forest resources have very limited influence-levels while those with potentially high influence have little or no interest in the conservation of forest ecosystems ([see section 7.3.7](#)).

The issue of the Land Use Act that has removed the right of land ownership from the communities and has vested it in the government is making it difficult to achieve effective forest resources legislation and management ([see section 6.3.2](#)).

All the key stakeholders (government, community and SPDC) are willing to collaborate for the purposes of sustainably managing the Niger Delta forest resources ([see section 7.4](#)). The rural dwellers' concern is whether their interests will be taken care of; they do not trust the government; in their words "*government can be treacherous*".

8.4 Discussion

Drawing from the summary of findings, it is necessary to make the Niger Delta forest, which is the source of survival of many rural people, sustainable. It is unfortunate that the agencies that are supposed to assist in this regard (the government, and to some extent the private sector) are largely not interested in conservation of the forest resources. The groups that have this interest do not have the necessary influence to make it happen. This situation will further make worse, the vulnerabilities of the rural dwellers and negatively impact on their survival strategies and wellbeing. Policies and institutions are capable of reducing the vulnerabilities of the rural dwellers, giving them alternatives and bringing about development (Mukherjee and Zhang, 2007; Ostrom *et al.*, 1993). But this has not happened, and this lack of alternatives will increase the present pressure on the Niger Delta ecosystem services, making the only source of livelihood of the rural people unsustainable.

8.5 Recommendations

The research recommends a collaborative forest management approach, which involves all identified stakeholders (Sudrajat *et al.*, 2012; Grimble and Wellard, 1997; Grimble and Quan, 1993; Grimble *et al.*, 1994; LENF, 1998; Graves *et al.*, 2009; Ezealor, 2006; MA, 2005; Bromley, 1991; Baltzer, 1998; Adger and Luttrell, 2000). It will be necessary to further discuss roles and responsibilities of each stakeholder in the partnership arrangement. This will allay the fears of the rural dwellers. *Alternatively, the rural communities, who are the immediate users of these resources, should form a coalition that will be able to draw necessary attention to the sustainable management of the forest resources.*

The present low level of interest of the government will need to be considered. This is important because government is central to all other stakeholders. They should act as the nucleus for the partnership arrangement, *although the SPDC's GMOU could be used as the starting point.* Also, it is necessary to determine how the interest level of the context setters can be increased. The foreign agencies could be helpful in this regard (*their presence helped the achievement of a successful PFM in Ethiopia*); they could

exert some pressure by invoking some of the several conventions to which Nigeria is a signatory in order to make them more involved in the conservation of the forest resources. The “subjects” should also form alliances, which will increase their influence level. Again, how powerful this alliance would be can only be ascertained when it becomes functional because funding could become a major issue; the financial power still remains the oil companies and the government. Perhaps a good starting point for this partnership arrangement could be the expansion of the SPDC’s GMoU. In this arrangement, the government, oil exploration company and the rural community are already included and it is functioning. The only challenge is that the community has not seen the need to prioritise forest resources conservation. In this regard, environmental education principles could be used.

Government should revisit and review existing forest policies as well as laws governing forest conservation areas; this may not be achieved except the rural dwellers and NGOs will form pressure groups to push for it. The SPDC should also devise a means of making their host communities to prioritise forest conservation in their GMoU projects; the present method of allowing the communities to decide how and what they will want to do with the GMoU money is not yielding the best results.

The Government has put the structures and policies in place but lacks the political will to implement these policies. There should be the sharing of royalties between host communities and the government; for example, the monies accruing as revenues to the government from the issuance of logging licences and concessions can be shared in a ratio with the local communities from whose forests these logs are extracted (Ezenwaka and Osang, 2010); the only drawback to this is the deep-seated corruption in the government system; this was an issue also in the Mozambiquan experience (see Box 2.1). Another step could be the encouragement of multiple land use system; this will encourage the production of variety of goods from the same piece of land (Obot, 2006; Mukherjee and Zhang, 2007; Ostrom *et al*, 1993); the Land Use Act and the distrust of community dwellers about government intentions may become obstacles to this point. An encouragement of regular stakeholder meetings and environmental education will help to re-orientate the rural dwellers especially concerning sustainable management of

the forest (Reid *et al*, 2006; Hauck *et al*, 2013; Urgenson *et al*, 2013); [the problem could be who to steer this meetings and make it functional](#). The weak policies should be reviewed to make them effective and relevant international laws should be domesticated in Nigeria; [again, to make this work, there would be the need to have a coalition for this purpose, to call the agencies to order](#). It is necessary for special conditions to be set for oil exploration companies operating in forest areas and also, oil exploration companies should develop a new technology for obtaining oil without damaging the ecosystem. [The large tax revenues they provide to government have made them hugely powerful and it is very difficult to legislate against them in order to restrict their activities or improve the way they operate. The Mozanbiquan case study is an example that illustrates how private sector operators have been able to use their financial power to manipulate the system in the their favour \(Box 2.1\).](#)

Policies are a major key in the livelihoods framework. The type of policies and their implementations have effects on livelihood strategies and outcomes of the forest-dependent rural dwellers (Carney, 1998). It determines what survival options are available to the people. Policies have the power to either reduce the people's vulnerabilities (by mitigating against the shocks and trends) or further expose the people to it. Policy therefore has the power to either make them achieve their livelihood outcomes or not. In this regard, the Land Use Act should be revisited.

Government should carry out a self-appraisal of its policies and that of the rural communities with a view to making the policies more effective. This process could: better equip and provide more funding to the forestry department; improve communication with the rural communities; carry out sensitizations and environmental education programmes; provide incentives or alternatives to the rural dwellers e.g. agro-forestry schemes, agro-enterprises and trainings in alternative skills for income generation. Government should also take into account traditional knowledge; traditional and cultural practices compatible with conservation and sustainable forest resource use should be adopted and improved upon; this recommendation is similar to that of [Newton *et al* \(2015\) in Nepal and Tanzania, where it was recommended that the design](#)

and implementation of the REDD+ should build on the experiences of community forest management.

It is important that the institutions of government should make the necessary changes so as to alleviate the vulnerabilities of the people and at the same time ensure the achievement of their livelihood outcomes. At the present, the livelihood strategy of the people is that of unsustainable harvesting of the ecosystem benefits, which has serious implications for future availability.

In summary:

- Government should review its forest policies / laws to make it participatory; provide alternatives to communities' dependence on forest resources; should consider royalty payment to communities; regulate oil exploration activities in forest areas; carry out environmental education initiatives; better equip and fund the forestry department
- Communities should form alliances or coalitions with local NGOs to increase their influence levels
- Oil exploration companies should become more environment-friendly and proactive
- International agencies should exert influence on the government and the oil exploration companies to make them more environment-friendly

To make the above effective, there would need to be an independent coalition of interested stakeholders to act as the drivers. From the outcome of this research, the SPDC's GMOU is already accepted in the communities. This could be an easy starting point. Corruption in government may not allow the government agencies to be effective but this coalition could begin to make change through engagement and action with the government agencies and oil exploration companies.

The summary of the findings and recommendations is shown pictorially in Figure 8-1. The timeline is divided into three: past, present and future; the past presents what policies were adopted before now, and the corresponding results. The 'present' shows what is being done at the moment, and the results so far; while the future shows what may happen in the future if the current methods are continued with. In the past, the

method adopted to achieve sustainable forest management was not collaborative; it was ‘top-down’. The result was unsustainable harvesting of forest resources. At present, the method adopted is still ‘top-down’ and not collaborative; the result is that more forest resources are being lost. For the future, the risk is that virtually all forest resources will be lost if there is no review and change in the current management method. The recommended approach to reversing this negative trend and to ensuring recovery and abundance of forest resources is a review of the current policies and strategies. This should be done in four steps:

- (i) stakeholder mapping and engagement;
- (ii) identification of roles and responsibilities for each stakeholder;
- (iii) stakeholder agreement and collaboration on terms, and;
- (iv) regular stakeholder meetings to review progress and make changes as is necessary.

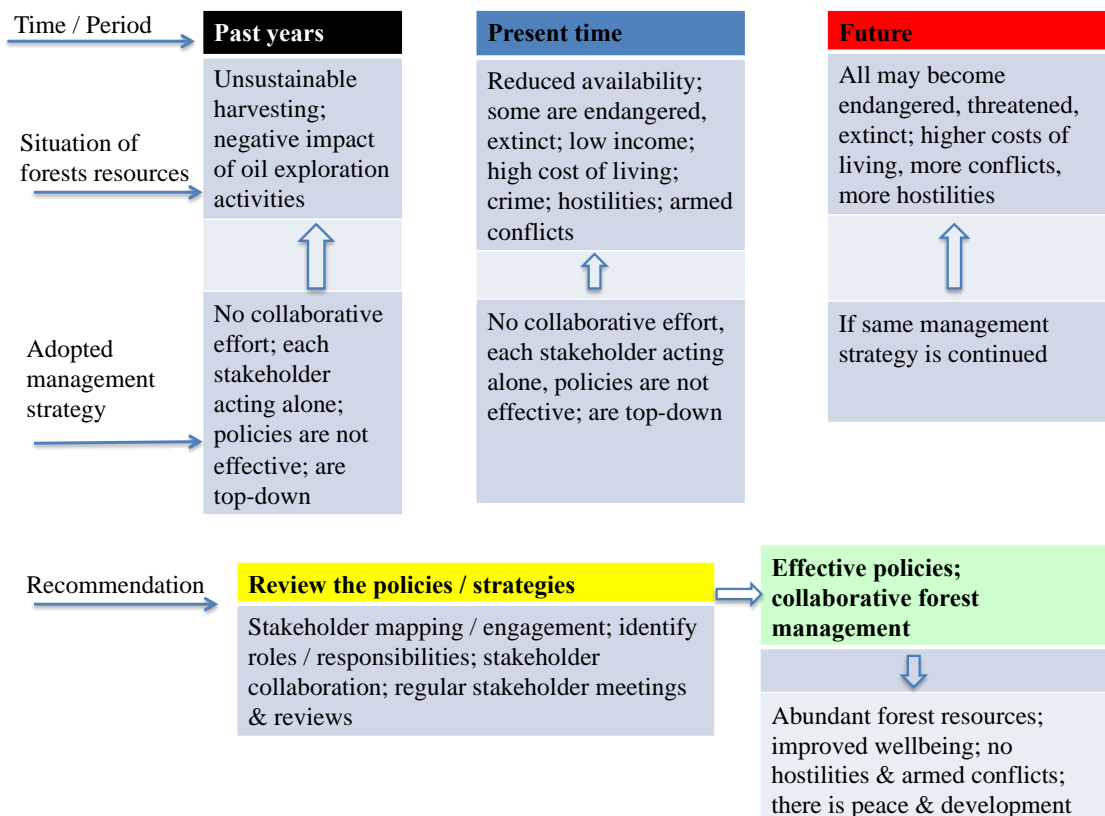


Figure 8-1: Historic timeline of forest management strategies and impacts in the Niger Delta, and two future scenarios.

9 CONCLUSION AND RECOMMENDATION

This section discusses the achievements of the research in comparison with the set objectives.

The main aim was to appraise local community dependency and involvement in forest resources management in the Niger Delta in order to help develop a framework for the sustainable management of the forest resources that includes local communities as a key stakeholder in the process. This was based on the fact that future of the Niger Delta forests and its benefits to local stakeholders depends on the continued delivery of forest's goods and services within a stable ecosystem which is at the moment threatened by many factors that are likely to become increasingly acute in the future, reducing the flow of NTFP benefits to local people. Also of note is that, as pressure on these resources increases and the delivery of ecosystem services decreases, there will be a resultant growth in resource conflict, deprivation, and hardship amongst the stakeholders in the Niger Delta. Therefore a clear management plan, which involves all key stakeholders in the region, will contribute to sustainable utilization of forest resources.

The specific objectives were to:

- (i) Identify the stakeholders in the utilization and management of the forests of the Niger Delta and analyze their interests
- (ii) Identify and classify the various ecosystem services provided by the Niger Delta environment
- (iii) Identify and appraise the current (existing) options for the sustainable management of the Niger Delta Forests
- (iv) Appraise the level of involvement of community in managing the (their) forests
- (v) Propose an approach / framework for the sustainable management of the Niger Delta Forests

The conclusions of this research on each of the above objectives are presented below.

9.1 Conclusions

9.1.1 Identification of forest stakeholders and analysis of their interests

The Niger Delta forest stakeholders were identified to include the rural dwellers, the government, the oil exploration companies, the academia and research institutions, the urban dwellers, local NGOs, wood based industries and international and foreign organisations such as the United Nations.

They were classified according to their levels of interests in and influence over the achievement of sustainable forest resources management as: subjects (the rural dwellers, local NGOs and the academia / research institutions); context setters (the government and the oil exploration companies); the crowd (urban dwellers and wood based industries); and the key players (international / foreign organisations such as the UN).

The research found that the rural dwellers whose livelihood is tied to the forest ecosystems have little or no influence over what happens to their source of livelihoods. On the other hand, the government, which is supposed to be the policy maker and implementer and therefore a source of relief from the livelihood vulnerabilities of the rural dwellers, are only context setters, with no real interest in forest resources sustainability. [See chapter 7.](#)

9.1.2 Identification / classification of Niger Delta forest ecosystem services

The Millennium Ecosystem Assessment framework was used to identify and classify the Niger Delta forest ecosystem services. The research found that the people benefitted from a wide range of provisioning, regulatory, cultural and supporting services of the forest ecosystem. The people, especially the rural dwellers, are 95% dependent on these services for their survival. However, these resources are declining in availability. Many are threatened while some others are now extinct. While the urban dwellers are knowledgeable on the wide range of ecosystem services provided by the Niger Delta forests, the rural dwellers that survive from these services are mostly aware only of the provisioning ecosystem services. All the respondents agreed to the importance of the forest ecosystem and the need to sustainably manage it; [see chapters 4 and 5.](#)

9.1.3 Identification / appraisal of current forest management methods

There are currently two forest management systems in the Niger Delta. The community has a variety of traditional forest resources management systems while the government has also come up with many policies aimed at managing the forests. The community does this by deifying some resources and such resources stands protected. They also set aside sanctuaries where no one can enter except at certain occasions. There are also controlled areas where harvesting is done at defined periods. All these are various ways in which the communities have helped to conserve / preserve their resources. The government's style is in policy formulations. There are various forest protection laws in place including setting aside of some forests as reserves where no one is supposed to go to harvest forest resources except by permission.

The research found that government efforts are not yielding anticipated results. The efforts are not known by the community dwellers. Only a few urban dwellers are aware of such policies. There is still poaching and illegal harvesting of timber in the reservation areas. Bureaucratic bottlenecks, insufficient funding and lack of equipment are part of the reasons for the poor performances. On the other hand, the community laws are very effective where they exist and have been able to preserve and conserve the intended resources. [See chapter 6.](#)

9.1.4 Identification of level of community involvement in forest management

At present, the communities are not involved in any forest resources management decisions by the government. The method of decision-making is top-down. The land use decree of 1978 further compounded this problem by removing land ownership rights from the communities and vesting it on the government. This gives the government absolute rights to possess any portion of land at any time for any purposes. The issue of land ownership and by extension, resources ownership, is a cause of many conflicts in the region. [See chapter 6.](#)

9.1.5 Possibilities for collaborative forest management in the region

All the stakeholders agreed that forest ecosystem benefits are declining. All stakeholders are also willing to cooperate and form partnerships for the purposes of

better management of the Niger Delta forests. Through the stakeholder forum which was organized for the purposes of stakeholders meeting to discuss their interests, the stakeholders were able to appreciate the fact that they all have a stake in the forest and as such will need to form alliances to properly manage it for the benefit of all. [See section 7.4.](#)

9.2 Recommendations

From the conclusions of this research, a participatory forest management approach is recommended ([Sudrajat *et al*, 2012](#); [Grimble and Wellard, 1997](#); [Grimble and Quan, 1993](#); [Grimble *et al*, 1994](#); [LENF, 1998](#); [Graves *et al.*, 2009](#); [Ezealor, 2006](#); [MA, 2005](#); [Bromley, 1991](#); [Baltzer, 1998](#); [Adger and Luttrell, 2000](#)). This will yield the much-anticipated results of conserving the Niger Delta forests.

The government, presently classified a context setter, will need to find the needed political will to formulate and implement result oriented policies. It is recommended that the government should review its existing policies and also learn from the community's conservation approaches ([Newton *et al*, 2015](#)). Although the community policies are effective, they are limited in the sense that they can only be applied in the community where they have been formulated. The government is able to draw lessons from the community laws and apply same principle over larger geographic areas. However, for this to happen, there would need to be a coalition of interested stakeholders to ensure that a demand is placed on the government to act in the interest of the Niger Delta environment. The deep-seated corruption in government will definitely be an issue to contend with (this was reported to be an hinderance in PFM in Mozambique and Tanzania, see [Box 2.1](#)).

The rural communities and local NGOs should form coalitions as is necessary in other to increase their influence levels. They could then become like a pressure group, able to make the government to become more responsive. [Funding may be an issue here. These non-government organizations hardly have any independent source of income; they rely almost entirely on grants from the government and oil exploration companies; funding](#)

support from a foreign organization was partly responsible for the success of PFM in Ethiopia, see Box 2.1).

The absence of alternatives is making rural dwellers harvest the forest resources at an unsustainable rate. The government and the private sector players should provide alternatives to the rural dwellers in the form of enterprise developments, vocational skills, agro-processing, domestication and education on sustainable forest management principles like agro-forestry. It will be necessary to first find a way not to politicize this action step. The politicization of this action step will render it non-effective.

Environmental awareness campaigns will also help to increase awareness of the benefits that human beings derive from the environment and the need for their proper management; who to fund this action could be an impediment to this action step.

9.3 Recommendations for future research

This work should be considered a baseline, as there is no other known work such as this in the Niger Delta. This work was limited in scope i.e. number of communities and people that could be sampled, largely due to costs constraints and security concerns during the fieldwork phase. It would be useful to carry out this work over a larger geographic area.

Because of security and safety concerns, no transect walk was done into the forests to get a primary observation and or recording of resource types and availability. Most of the fieldwork was done within and around the communities. It would be useful to obtain first hand information of resource types and availability by taking a transect walk into the forests.

The work did not delve into conflict issue in the Niger Delta although it is a major matter affecting resource use and management in the Niger Delta. Future work should try to incorporate this.

It will be good to see the result that the “theory of change” will give if applied to achieve the same objectives that this research was aimed at. The theory of change describes how and why a desired change is expected to happen in a given context; it analyses what is to be achieved as well as steps or actions to be taken in order to arrive at the desired destination. The strategy is to first identify the long-term goal (e.g. sustainable forest management) and then working backwards from this, to identifying what must be done in order for the long-term goal to be achieved. All these are mapped out in an outcomes framework or pathway; this will show all outcomes in a logical relationship to all others and in a chronological flow (Brest, 2010; Clark & Taplin, 2012).

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APPENDICES:

Appendix A : Report of the stakeholder workshop

Title: *Stakeholders in forest resources utilization and management; building partnerships for sustainable management of the Niger Delta forest resources*

Date: 04 December 2014

Venue: Conference Hall, Ayalla Hotels Ltd., Yenagoa, Bayelsa State, Nigeria

CONVENER:

Ezenwaka Jasper,
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1.0 Introduction

This workshop was held to make the identified forest stakeholders in the Niger Delta interact and discuss their interests, with a view to finding the way forward towards the sustainable management of the Niger Delta forest ecosystems. The stakeholders had been previously identified through discussions with key players in the sector and in the region.

The process of bringing the stakeholders together involved:

- the writing and dispatch of *Introduction / Invitation Letters*, which thoroughly explained the nature, and purpose of the workshop. These letters were used to solicit their kind participation.
- personal visits and telephone calls to each invitee; this was to further explain the purpose of the workshop and clarify any issues. The visits / telephone calls was used to secure commitment i.e. willingness to participate.

The workshop discussed issues of forest resources utilization and management in the Niger Region.

The entire workshop process was recorded using video. This report is a summary of main outcomes from this workshop. It is noteworthy to mention that this was the first time that forest stakeholders in the region was meeting to discuss their interests and issues surrounding forest resources management.

2.0 Attendance at the workshop

All invited stakeholder groups were represented at the workshop except for the oil exploration companies (but with apologies). There were a total of 19 people in attendance; this number was comprised of three people from the academia; three civil society organizations; six people from government; one person from the legislature, and

six people representing two rural communities. 32% of the attendees were females. Table 1 (below) shows details of the attendees' particulars. The original attendance sheet (with signatures) is attached as appendix 1.

Table 1: Attendance at the workshop

S/N	Name	Organization	Designation	Phone Number	Stakeholder Group
1	Dr. Ebimiewei Etebu	Niger Delta University	Professor	08066251407	Academic
2	Mrs. Gloria Tungbulu	Niger Delta University	PhD Research Student	08060527963	Academic
3	Mr. Amukali Ogochukwu	Shareholders Alliance for Corporate Accountability	PhD Research Attaché	08136152810	Academic
4	Mr. Abba Ayemi	Shareholders Alliance for Corporate Accountability	Director	08035005530	Civil Society
5	Ms. Jennifer Mohammed	Self Help & Rural Development Association	Community Mobilizer	08033924619	Civil Society
6	Ms. Ekeke Uloma	Anpez Centre for Environment & Development	Programme Officer	08030977262	Civil Society
7	Mr. Festus Egba	Ministry of Forestry & Environment	Deputy Director	08067141457	Government
8	Mr. Erefamote Gorsuch	Ministry of Forestry & Environment	Deputy Director	08068159514	Government
9	Mr. Timitimi Ebiki	Ministry of Forestry & Environment	Forest Officer	08063280000	Government
10	Mr. George Amoru	Ministry of Forestry & Environment	Director (retired)	08037744106	Government

S/N	Name	Organization	Designation	Phone Number	Stakeholder Group
11	Mrs. Lilian Oboro-aye	Office of Secretary to Government		08064740436	Government
12	Hon. Victor Akenge	Office of Secretary to Government	Adviser	08034517116	Government
13	Hon. Gentle Emelah	Bayelsa State House of Assembly	House Member	08035856492	Legislature
14	Mr. Patrick Matthew	Akipelai Community	Youth Leader	08036582886	Community
15	Mrs. Itasobo Okon	Akipelai Community	Women Leader	08147481429	Community
16	Mr. Igbigi Dominic	Akipelai Community	Community Dev. Committee	08167531975	Community
17	Mr. Arowefi Godfrey	Akpide Community	Youth Leader	08165605012	Community
18	Mrs. Miriam Abusi	Akpide Community	Women Leader	07031313902	Community
19	Mr. Rogers Isowe	Akpide Community	Community Dev. Committee	08097877350	Community

3.0 Programme of activities

The table 2 below shows a summary of events / proceedings during the workshop.

Table 2: Activities during the workshop

S/N	Activity	Objective	Person Responsible	Time
1	Welcome and Opening session	Breaking the ice and setting the objectives for the meeting	Jasper	9.00am
2	Introduction of the PhD research details and results from field interviews	To raise main issues emanating from the field interviews which should form the basis for the forum discussions	Jasper	9.15am
3	Experience sharing	To hear experiences of other people	All	9.45am
Tea-Break				10.15am
4	Plenary discussion of issues arising from the presentation(s)	To take decisions and strategize on way(s) forward	Jasper	10.40am
Lunch Break				12.40pm
5	Communiqué	To summarize the agreements reached in this workshop	Rapporteurs	1.40pm
6	Appreciation / Closing		Jasper	2.00pm

4.0 Outcome

4.1 Welcome / opening session

The purpose of this session was to welcome the participants; make them comfortable with each other and also to introduce the purpose for the workshop.

The participants were made to introduce themselves one at a time, in plenary. The objective of the meeting as well as the activities for the day was then explained. The objective of the forum was to discuss the issues of forest ecosystem benefits and its sustainable management.

4.2 Introduction of the PhD Research details and Results from field interviews

The purpose of this session was to present the objectives of the PhD research; explain the methods adopted to achieve the objectives; and mention main issues emanating from the field interviews (which should become a guide for the forum's discussions). This session was also an opportunity for the stakeholders to listen and react to the methods adopted as well as main findings from the field interviews i.e. if it represents the true state of issues in the Niger Delta.

At the end of the presentation, which was made, the forum was asked to react to the main issues highlighted as well as adequacy of the methods. The forum agreed that the issues were well represented and that the method was adequate. The forum wished that there were data to show changes in forest cover in the region over time.

Issues raised during this presentation were used to guide the discussion session that took place after the tea break.

4.3 Experience sharing

The aim of this session was to learn from the experiences of other people. A few people shared their experiences; the main points are provided below:

Ministry of Forestry and Environment:

- The ministry carries out awareness campaigns.

- Awareness campaign is a duty of all.
- Forests prevent flooding.
- Awareness creation activities should be extended to the rural areas

Amoru (Retired Director of Forestry):

- He had carried out sensitization activities with host communities of the forest reserve areas when he was still in the service of the government.
- He wondered why the people are still not aware of the fact that their forest was part of a government forest reserve.
- His sensitization work was not so effective because he only invited delegates to the city and did not carry out the sensitization activities inside the communities.

Shareholders Alliance for Corporate Accountability:

- There is a conflict of interest between people's source of livelihood and exploration for crude oil: while the people depend on their forest for survival, the government wants the money that accrues from crude oil exploration
- Oil exploration companies are given licenses to operate even within forest reservation areas not minding the attendant pollution and loss of biodiversity
- Government needs to set special operating rules for the oil exploration companies if they must be allowed to operate within designated forest reservation areas
- The effect of environmental pollution could last for several years

Etebu (Niger Delta University):

- He raised the issue of lack of data; no baseline data to work with in the Niger Delta; no data on forest degradation / use
- He suggested that this research (my PhD) could be considered a baseline on which future works could rely on
- Government is not interested in sustainability of forest resources

- Policies are not being implemented
- He raised the need for environmental education (he recalled that he once suggested on Facebook that wildlife needs to be protected in the Niger Delta but the response he got was ‘how can someone be suggesting that wildlife be conserved / protected when people are still hungry?’).

4.4 Plenary discussion of issues arising from the presentation(s)

From the presentations, the following were the themes that emerged for further discussions. The issues were discussed in plenary; the themes and conclusions are summarized in Table 3 below.

Tables 3b and 3c were also outcomes from the plenary discussions; while Table 3b shows stakeholder interests / influence on forest management issues in the Niger Delta, Table 3c shows interactions or communications amongst stakeholders.

Table 3: Themes for plenary discussions and Forum's conclusions

S/N	Themes	Forum's Conclusions
1	<p>Ecosystem Services & Dis-services</p> <ul style="list-style-type: none"> • Importance of the forest to the economy and livelihood of the community people • Other services not already enumerated in the MA's framework • Dis-services 	<ul style="list-style-type: none"> • The forest is important to the livelihoods of the people of the Niger Delta • Other services (in addition to the ones enumerated in the MA's framework) include: habitat function, breeding ground for wildlife, medicinal value, bio-fuel, wind break • Dis-services include: breeding ground for mosquitoes, snakes, hiding place for kidnappers and militants, criminalities
2	<p>Policy issues on forest conservation</p> <ul style="list-style-type: none"> • Effective community laws • In-effective government laws 	<ul style="list-style-type: none"> • Agreed that community laws are generally effective (where they exist) but that government laws have been ineffective • Government has put the structures and policies in place but lacks political will to implement • Some reason were given for ineffective government policies: <ul style="list-style-type: none"> ○ No working tools ○ As a result of poverty, people do not respect the laws that govern the conservation areas ○ Lack of alternatives to the use of forest resources ○ Lack of enlightenment ○ Inadequate / ineffective legislations to regulate oil companies activities ○ Lack of continuity in policy implementation due to changes of officers • Suggestions on ways forward were given:

S/N	Themes	Forum's Conclusions
		<ul style="list-style-type: none"> ○ There should be the sharing of royalties between host communities and the government ○ Encouragement of multiple land use system ○ Regular stakeholder meetings and environmental education should be done ○ Policies should be reviewed to make them effective ○ Relevant international laws should be domesticated in Nigeria ○ Special conditions should be set for oil exploration companies operating in forest areas ○ Oil exploration companies should develop a new technology for getting the oil without damaging the ecosystem
3	<p>Identifying stakeholders in forest management</p> <ul style="list-style-type: none"> ● Who are the stakeholders? ● What roles should they play? ● Stakeholder interests / influence ● Stakeholder communication 	<ul style="list-style-type: none"> ● The list of forest stakeholders (previously identified) were ratified; no additions or eliminations ● Roles: <ul style="list-style-type: none"> ○ Oil exploration companies have technical knowledge of the impacts of their activities; they should live up to their social responsibilities ○ The environmental management component of the GMoU should be strengthened ○ Communities should as well begin to plant trees ○ Government should review policies to make them effective ● The output for stakeholder interest / influence and communications are shown in Tables 3b and 3c respectively

Table 3b: Stakeholder level of interest and influence on forest management

Key question: Who has interest in and influence over forest ecosystem services? The scoring is between 1 – 10 (Low – High)					
S/N	Stakeholder	Level of “Interest”	Level of “Influence”	Justification for level of interest	Justification for level of Influence
1	Oil Exploration Companies	1	9	Main focus is on profits from oil explorations	Large financial resources
2	Government	2	9.5	Although has created many policies to protect forests and signed up to many international conventions; this is just a show off; some of them are due to pressures from foreign governments; Very limited ability to implement policy, lack of political will, corruption, more concerned about profits from oil exploration activities	Government has all the machineries needed to make the difference if there can be a political will
3	Local Environmental NGOs	9	4	Have been funding conservation efforts and been building capacity of local people on conservation	Influence is limited to advocacy; can't make any national policy changes, influence is on a small scale (usually local and not national); influence hardly continues after the exit of the NGO
4	Rural dwellers	10	1	Their survival is over 95% dependent on the environmental resources	They have no power to effect policy neither can they influence the oil companies that ravages their environment, destroying their natural capital; no financial power; no human and physical capitals; lacks strong external social network
5	Urban dwellers	5	1	Their awareness about global warming has increased their interest in forest conservation	They are not formed into any coalition; just lone voices; can't influence policy shift

Key question: Who has interest in and influence over forest ecosystem services? The scoring is between 1 – 10 (Low – High)					
6	Foreign International Organisations e.g. UN, USAID, DfID, EU, WorldBank	/ 9	9	Champions of environmental conservation	Have the power to influence policy of member or beneficiary countries and multinational oil exploration companies
7	Academia & Research Institutions	8	3	They are informed and appreciates the functions of the forest; educates people on best practices	May be able to influence individuals but not systems (policy) because of lack of political power; teachings ends up in the classrooms and research outputs / recommendations ends up not being implemented
8	Wood based industries	2	1	They are interested in their profits from the business and not conservation	Profit oriented

Table 3c: Stakeholder communications

S/N	From	To	Remarks / Content of communication	Strength
1	Oil Exploration Companies	Government	Oil Extraction, Policy & Economic issues	Weak
		Local Environmental NGOs	Consultancies to execute jobs	Weak
		Rural Dwellers	Negotiations for right of passage i.e. to enable them do exploration activities	Weak
		Academia & Research Institutions	Consultancies	Weak
2	Government	Oil Exploration Companies	Oil Extraction, Policy & Economic issues	Weak
		Local Environmental NGOs	Policy setting, Registration / Permission to operate	Weak
		Rural Dwellers	Policy, Development, Security	Weak
		Urban Dwellers	Policy, Development, Security	Weak
		Foreign / International Organisations e.g. UN, World Bank, EU, Dfid, USAID	International cooperation / bilateral agreements, International conventions	Strong

S/N	From	To	Remarks / Content of communication	Strength
3	Local Environmental NGOs	Academia & Research Institutions	Funding, Policy	Weak
		Wood based Industries	Policy, Tax, Regulation	Weak
		Oil Exploration Companies	Funding, Consultancies, Advocacy	Weak
		Government	Funding, Consultancies, Advocacy	Weak
		Rural Dwellers	Project implementation, Capacity Building, Community Development, Conflict mediation / Resolution	Strong
		Urban Dwellers	Advocacy	Weak
		Foreign / International Organisations e.g. UN, World Bank, EU, DfID, USAID	Funding, capacity building	Medium
4	Rural Dwellers	Academia & Research Institutions	Consultancies	Weak
		Oil Exploration Companies	Compensations, Agitation for rights / Benefits, Community Development	Weak

S/N	From	To	Remarks / Content of communication	Strength
5	Urban Dwellers	Government	Community Development, Chieftaincy issues, Land Boundary issues, Intra & Inter Community Peace / Conflict issues	Weak
		Local Environmental NGOs	Assistance for community development, mentorship, capacity building, disputes resolution	Weak
		Urban Dwellers	Access to information, guidance in decision making, funding, links to external agencies	Weak
		Wood based Industries	Granting of permission to operate within the local forest, collection of royalties	Weak
		Government	Advocacy	Weak
		Rural Dwellers	Information dissemination, education / enlightenment	Weak
		Foreign / International Organisations e.g. UN, World Bank, EU, DfID, USAID	Advocacy, funding	Weak
		Academia & Research Institutions	Access to information	Weak

S/N	From	To	Remarks / Content of communication	Strength
6	Foreign / International Organisations e.g. UN, World Bank, EU, DfID, USAID	Government	Funding, bilateral cooperation, international conventions	Strong
		Local Environmental NGOs	Consultancies, community development, advocacy, capacity building	Medium
		Academia & Research Institutions	Consultancies, Information	Medium
7	Academia & Research Institutions	Oil Exploration Companies	Research, funding, consultancies, advocacy	Weak
		Government	Funding, advocacy	Medium
		Rural Dwellers	Information extraction for research	Weak
		Urban Dwellers	Information extraction for research	Weak
		Foreign / International Organisations e.g. UN, World Bank, EU, DfID, USAID	Funding, consultancies	Weak
		Wood based Industries	Information extraction for research	Weak
8	Wood based	Government	Registration for license, tax payments	Weak

S/N	From	To	Remarks / Content of communication	Strength
	Industries	Rural Dwellers	Negotiation for right of passage i.e. to extract timber from the local forest	Weak

5.0 Communiqué

The aim of this session was to summarize the agreements reached during the forum and for the forum participants to agree, disagree or make amendments.

The outcome of the discussions was carefully outlined and was agreed to by the participants.

6.0 Evaluation

The aim of this evaluation was to get a feedback from the stakeholders about this PhD research. An evaluation sheet was therefore prepared and given to participants to anonymously fill out. 15 participants (out of the 19) were able to fill it and submit; others were not able to fill the form, probably because of inability to read or write.

A score of 1 – 5 was to be given to each scoring criteria depending on what the respondent feels (1 being the lowest and 5 being the highest). With this, the highest obtainable score per criteria will be 75 i.e. 5 marks multiplied by 15 respondents. A summary of the outcome is shown in Table 4 below.

Table 4: Outcome of the evaluations of the PhD research by forum participants

S/N	Criteria	Scores obtainable	Scores obtained	Percentage
1	Relevance of the study	75	70	93.3
2	Adequacy of the adopted method	75	64	85.3
3	Coverage of essential and relevant areas of the topic	75	61	81.3
4	Appropriateness of the recommendations proffered	75	67	89.3

From the above (Table 4), the general average score is 87.3%. This core shows that this research work is highly valued by the Niger Delta forest stakeholders.

7.0 Appreciation / Closing

The participants were appreciated for their time. Appreciation was also extended to the Shell Petroleum Development Company (SPDC) of Nigeria that provided the venue and refreshments. Although no staff of SPDC could attend the meeting, they were very cooperative during my interview with them. They also facilitated my meeting with some notable Civil Society Organizations and individuals that made very useful contributions to my work.

8.0 Some Photographs:



Photo 1: A government official speaking during the meeting



Photo 2: The researcher making his presentation

Appendix B : Interview transcripts (Communities)

Place: Akpide-Biseni	Participant: 1
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you have other source(s) of employment or income? • So, like what percentage of your household income comes from the forest? • What will you say is the average level of dependence of your community people on the forest resources? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • What are the benefits you can mention? • Do you have any alternative sources for these benefits? • Is the Akpide (Biseni) forest part of a government forest reserve? • So, you are able to enter any part of your forest at any time and harvest or 	<ul style="list-style-type: none"> • I am a farmer and fisherman (Community Chief; Retired Teacher) • No • I will put it at about 95% • We are basically farmers and fishermen in this community. I will say we depend almost entirely on our forest for survival. About 90%. • Food. We get our food from the forest. • These days, all the forest resources are seriously declining. They are even threatened. • I think the population is increasing and there is no employment; many more people are depending on the forest for survival. Oil pollution is also destroying our lands. Our crops do not yield as much again. • Food, medicines, firewood, ropes, fruits, timber, bush meat, snails • No. No any alternative source. • No, it is not. • Yes, we enter any part of our forest; we collect any resource that we like. Only

Place: Akpide-Biseni	Participant: 1
Question	Response
<p>collect anything you want?</p> <ul style="list-style-type: none"> • Can anybody enter any part of your forest and harvest anything as they want? • Do women own lands here? • But are there any community or native laws that protect certain environmental goods or services? • Can you name some of those lakes that are protected by native laws? • How effective is this native law? 	<p>that if you take timber outside the community towards the city, the Forest Guards may stop you and charge you for felling of timbers. We do not also hunt elephants because of government prohibition.</p> <ul style="list-style-type: none"> • No. There is fragmentation of lands here. The community land is divided into family units and further divided to individuals in the family. You are free to hunt, pick snails, leaves and other non timber forest products from any part of the entire forest but cannot fell timber on another man's land or cultivate on it. • No. But they can farm on their husband's land and has access to the forest resources. • Yes. We have native laws that protect our lakes. We do not fish in those lakes that our laws protect until after three years (three years rotational harvesting period). But these young ones of these days are impatient, they are modifying the laws every time, they now fish in those lakes every two years. This is affecting the size of catch; the fishes are becoming smaller. We also forbid the killing of crocodiles in this community. • Yes, Lake Esiribi, Ayuu, Eremini, Puro, Mowei, Asemini, Kilapuro • These laws are very effective, any contravention attracts serious sanctions so the people obey and live by the rules

Place: Akpide-Biseni	Participant: 1
Question	Response
<ul style="list-style-type: none"> • Are you aware of any government effort aimed at conserving this forest? • But will this community be willing to collaborate with other stakeholders for the purposes of managing your forest resources? • Do you sell lands to non-natives? 	<ul style="list-style-type: none"> • No • Yes, so far that it will be to our benefit; but government can be treacherous, that is the problem. • Yes, but it is by the family and not by individuals.

Place: Akpide-Biseni	Participant: 2
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you have other source(s) of employment or income? • What percentage of your household income comes from the forest? • What will you say is the average level of dependence of your community people on the forest resources? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still 	<ul style="list-style-type: none"> • I am a farmer and also Chairman of the Akpide Community Development Committee. • Apart from farming? No. But I do fishing and collection of snails and Ogbono fruits when it is its season. • My family depends mainly on what we get from our farms, forests and fishing activities. My wife does some trading (still on farm produce and non timber forest products). Over 90%. • This is difficult to say; but we do not have access to government or private sector employment here so I will say that we depend almost entirely on our environmental resources. • Ogbono (<i>Irvingea gabonensis</i>) and snails; they fetch a lot of income and also serve as food for the family. • They are all reducing.

Place: Akpide-Biseni	Participant: 2
Question	Response
<p>abundant, declining or threatened?</p> <ul style="list-style-type: none"> • Any reasons for this? • What are the benefits you can mention? • Do you have any alternative sources for these benefits? • Is the Akpide (Biseni) forest part of a government forest reserve? • What is the name of the Reserve? • But are you restricted from harvesting the forest resources by any government laws or agents? • Can anybody enter any part of your forest and harvest anything as they want? • Do women own lands here? • What about for farming and collection of forest products? • Are there any community or native laws that protect certain environmental goods or services? 	<ul style="list-style-type: none"> • Our youth are unemployed. Many more people are getting involved in harvesting these resources (as it is the only available source of income). Oil pollution and gas flaring. • Firewood, timber, ropes, meat, medicines, income • No • Yes • I am not sure. I do not know the name. • No. We are free to harvest any resources we want from the forest • As a native, yes. But non-natives will have to seek the permission of the community before doing so. • No • They are allowed to farm on the lands but cannot own the land. They are free as the men to collect forest products. • Our lakes are protected by laws, we fish in them every three years but this is changing now (the years are being reduced to two years cycle). Some families forbid certain things but that does not pertain to the community as a whole.

Place: Akpide-Biseni	Participant: 2
Question	Response
<ul style="list-style-type: none"> • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? • But will this community be willing to collaborate with other stakeholders for the purposes of managing your forest resources? • Do you sell lands to non-natives? • Can an individual decide to sell portions of his land? • Is Akpide benefiting from the SPDC's GMoU? 	<ul style="list-style-type: none"> • These laws are well observed; consequences are grievous. If you kill a crocodile, the law stipulates that you bury it as you would a human being (the ceremony that goes with it). • No • Yes. We have been collaborating very well with external agencies (NGOs, Oil Companies, European Union) • Yes. • No. It is the family that sells lands and this is to non indigenes. • No. Shell has not done any project for us and has been operating in our land since 1972. At the moment, we have short down their oil well until they come to negotiate with us.

Place: Akpide-Biseni	Participant: 3
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What type of crops do you farm in this community? • What type of trading do you do? • If you are to separate your income, what percentage will you say comes from your farming activities and sales of items that come from the forest as against other income sources? • Why is it so? • What will you say is the dependence rate of the women on forest resources? • Why? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • What are the benefits you can mention? • Do you have any alternative sources for 	<ul style="list-style-type: none"> • I am the women leader. I do farming and trading. • We farm cassava, plantain, yam, maize, okra, cocoyam • It is petty trading (this has to do with some basic everyday household needs, farm and forest products; total capital involved a times is less than £400) • Over 70% is from the farm and forest products • Most of what I sell are still from the farm or forest e.g. Ogbono, snails, cassava • It is almost 100% • The majority of the women depend entirely on what they can get from their farm and collection of forest products • Ogbono (<i>Irvingea gabonensis</i>) • They are reducing in quality, quantity and size. We do not get them as we used to get them a few years ago • I cannot really say but my guess is that oil pollution is the cause • We get Ogbono, snail, firewood, leaves, vegetables, nuts • No

Place: Akpide-Biseni	Participant: 3
Question	Response
<p>these benefits?</p> <ul style="list-style-type: none"> • Is the Akpide (Biseni) forest part of a government forest reserve? • So, no government laws prevent people from collecting forest products including timber? • Can anybody enter any part of your forest and harvest anything as they want? • Do women own lands here? • What about for farming and collection of forest products? • Are there any community or native laws that protect certain environmental goods or services? • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? • Supposing an external agency is coming to partner with the community to manage your forests, what will be your response? 	<ul style="list-style-type: none"> • No • I do not know of any such government laws • Only natives (non natives has to seek approval of the Chiefs or family heads) • No • We farm on our husband's lands but we are free to collect forest products from any part of the community forest • Yes. Our lakes have laws. • People dread to contravene these laws. Even as a non-native, ignorance is not an excuse. • No • It will be a welcome idea. We will agree.

Place: Akpide-Biseni	Participant: 4
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you have other source(s) of employment or income? • What percentage of your household income comes from the forest? • What will you say is the average level of dependence of your community people on the forest resources? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • What are the benefits you can mention? • Do you have any alternative sources for these benefits? • Is the Akpide (Biseni) forest part of a government forest reserve? • So, people are not restricted from harvesting the forest resources by any government laws or agents? 	<ul style="list-style-type: none"> • I am a fisherman. • I do some farming and I pick some (non timber forest products) products from the forest for food and sales. • I depend solely on my fishing and farming. The money I get comes from these activities. • More than 95% • Timber • The sizes of the fishes are becoming smaller and the quantity is becoming smaller as well. All the forest resources are declining. • More people are depending on the forest. Technology is another reason (the use of sawing machine has made it easier to harvest timber). This makes the cutting down of the forest to be easier and faster. • Timber, firewood, snails, bushmeat, wine (palm/raffia wine) • No • No • Yes

Place: Akpide-Biseni	Participant: 4
Question	Response
<ul style="list-style-type: none"> • Can anybody enter any part of your forest and harvest anything as they want? • What about for non-natives? • Do women own lands here? • What about for farming and collection of forest products? • Are there any community or native laws that protect certain environmental goods or services? • Is it for the forests? • How effective is this native law? • Has there been any case of default that you know of? • Are you aware of any government effort aimed at conserving this forest? • Do you sell lands to non-natives? • Can an individual decide to sell portions of his land? 	<ul style="list-style-type: none"> • Yes, but you cannot fell timber on another person's land • Non-natives are restricted. They need permission to operate in our forests. • No • Yes • Yes • No, it is for the lakes. We forbid the killing of crocodiles. • They are strictly enforced • No. People generally obey these laws. We grow up to know of it (it is handed down) • No • Yes, but not common. These days people consider selling lands because of money • No. It will be the family.

Place: Akpide-Biseni	Participant: 5
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you have other source(s) of employment or income? • What percentage of your household income comes from these activities? • Do you own this house? • You are married and these are your children? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • What are other benefits you can mention? • Do you have any alternative sources for these benefits? • Is the Akpide (Biseni) forest part of a government forest reserve? • So, you are able to enter any part of your forest at any time and harvest or 	<ul style="list-style-type: none"> • I am a Hunter • I farm as well • 100% • Yes • Yes • Bushmeat (wildlife) • They are no longer as before (diminishing) • Flooding is destroying everything • Firewood, timber, ogbono, wine • No • No • Yes

Place: Akpide-Biseni	Participant: 5
Question	Response
<p>collect anything you want?</p> <ul style="list-style-type: none"> • Are there some types of animals you no longer have in your forest? • Is it due to hunting activities? • Can non-natives also hunt in your forests? • Why is this so? • But are there any community or native laws that protect certain environmental goods or services? • What about animals? • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? • If there are to be government laws, how do you think the people will react to that? Do you think they will respect it as they do the native laws? 	<ul style="list-style-type: none"> • We used to have elephants but they are no more. • No. I think it is as a result of development and noise (motor vehicles, roads construction passing through the forests, increasing oil exploration activities and expanding urban settlements) • Yes, but with permission from the chiefs (you have to introduce yourself and be welcomed by the leadership before venturing into our forest) • It is for security reasons (you cannot allow any person whom you do not know to be exploring your resources; it is also not safe for the indigenes). It is necessary to first ascertain their people before letting them have access. • Yes, like the lakes, they are protected by laws • We do not kill crocodiles • Very effective • No • I do not think so. Our native laws are part of our custom and tradition; it is part of us, we grow up to know them. By the way, why will government make laws for our own forest?

Place: Akpide-Biseni	Participant: 6
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Where do you get your raw materials? • From which forest? • Is the rattan still in abundance? • Why do you think so? • How far into the forest do you go in order to get the rattan? • Do you do any other work in addition to this? 	<ul style="list-style-type: none"> • I am a craftsman. I make these things (cane furniture) • I get it from the forest • I get it from this (Biseni) forest • Yes, it is still plenty in the forest • I use it and I know that it is still plenty. Not so many people use it because it is hard to bring out and also because not many people do this work (weaving craft) in this village. • I go very deep (far) into the forest to get it • No. This is the only work I do. I make tables, Chairs, Beds as well with the rattan

<ul style="list-style-type: none"> • So this is where you get money to keep your family? • How much do you sell this type of shelf that you have made? • Do you get buyers also from outside this village? • Are you a native of this community? • How come you are able to settle down (enter the forest and get materials for your work without any harassment)? 	<ul style="list-style-type: none"> • Yes • N4, 000 (£16) • Buyers come from within and outside this community • No • I got the approvals of the community leadership before I started. They are friendly with me. Also, no natives are involved in what I am doing.
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Place: Akpide-Biseni	Participant: 7
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you have other source(s) of employment or income? • Like what other things? • So, which other activities do you as a 	<ul style="list-style-type: none"> • I am a farmer. • Basically, we are all farmers in this community although we do some other things in addition. • Apart from farming, some people engage in fishing, hunting, collection of some forest products, weaving of fishing traps, baskets, etc. • We have lakes. I join to fish in the lakes

Place: Akpide-Biseni	Participant: 7
Question	Response
<p>person engage in apart from farming?</p> <ul style="list-style-type: none"> • How do you mean ‘season’? How does season determine what you do? • Going by what you have said, what percentage of your household income comes from the forest or farming or fishing activities? • What will you say is the average level of dependence of your community people on the forest resources? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • Do you think that some of your actions like farming, hunting, bush burning, cutting down the forest, etc can also be some possible reasons? • Will you support any effort aimed at improving your forest productivity? 	<p>when it is time for it. I also set traps for fish and bushmeat. I collect Ogbono. In short, what we do is determined by the season.</p> <ul style="list-style-type: none"> • We do not farm during the floods; we fish. Ogbono fruits does not fall all year round; it is seasonal. So, when the floodwaters have receded, we do active farming. When it is time to fish in our lakes, you will hardly find so many people around; most of us will be in the fishing camps (for weeks). • I depend entirely on them for survival; no other source; 100% • 90% of our people depend on the environment (if not more) • Food (meat, vegetables, fruits) • Everything is declining • I think population growth. Oil pollution. Gas flaring. • I do not know. So, will we not eat? We depend entirely on these things for our survival and they are not yielding as much as before again. • Yes

Place: Akpide-Biseni	Participant: 7
Question	Response
<ul style="list-style-type: none"> • Is the Akpide (Biseni) forest part of a government forest reserve? • Can anybody enter any part of your forest and harvest anything as they want? • Do women own lands here? • What about for farming and collection of forest products? • Are there any community or native laws that protect certain environmental goods or services? • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • No • Only natives • No • They are free • Yes, the lakes and crocodiles (we do not kill crocodiles here) • We do not toy with it; we take it very seriously (even a newborn baby knows the laws) • No

Place: Akpide-Biseni	Participant: 8
Question	Response

Place: Akpide-Biseni	Participant: 8
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Apart from fishing, do you do any other work? • I thought that most people here are farmers • By what you have said, does it mean that people do not take up paid employment (white collar jobs) here? • In that case, what percentage of family income of this community people come from the environment? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • Do you have any alternative sources for these benefits? • Is the Akpide (Biseni) forest part of a government forest reserve? • What makes your community or native laws (that protect certain environmental 	<ul style="list-style-type: none"> • I am a fisherman (also a Chief) • Yes, depending on the season • Well, everybody does a combination of things but basically farming and fishing • Some people serve as liaison officers for some companies operating around our communities, but how many are they? May be one or two. Even at that, they still engage heavily in farming and fishing activities. • I will put it at about 95% • Timber • Everything is changed now; they are all declining • Oil pollution and population growth. There is no alternative source of employment so everybody resort to what they can get from the environment (pressure on the resources as a result of more people having to depend on these resources) • No • No. I think there was a plan to make it a reserve but it is not. • Those native laws you are referring to are already part of our customs and

Place: Akpide-Biseni	Participant: 8
Question	Response
<p>goods or services) very effective?</p> <ul style="list-style-type: none"> • Are you aware of any government effort aimed at conserving this forest? • But will this community be willing to collaborate with other stakeholders for the purposes of managing your forest resources? 	<p>tradition. People do not go against such (customs and tradition). It is such that even the very young ones knows that you should not harm a crocodile or that you are not supposed to fish in a lake until a certain period. The opening of the lakes for harvesting is always heralded by festivals and people look forward to it.</p> <ul style="list-style-type: none"> • No • Yes

Place: Akpide-Biseni	Participant: 9
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • But do you engage in some activities that fetch you money? • In that case, your source of income is from activities that relate with the environment • Have you noticed any changes in forest resources (resources declining, or increasing)? • Any reasons for this? • When you pick the snails, do you leave the immature ones? • Why is that? • What are the benefits you derive from the forest? • Is the Akpide (Biseni) forest part of a government forest reserve? • Are there any community or native laws that protect certain environmental goods 	<ul style="list-style-type: none"> • I am unemployed (a youth) • Yes. I work in people's farms; I do fishing; I pick and sell snails, Ogbono, etc. • Yes • They are declining • I think we are over harvesting the resources. There are no employment opportunities here so we all depend on these resources. • No • If you leave it, others will pick them • I get money from there (it is my source of employment) • No • Yes

Place: Akpide-Biseni	Participant: 9
Question	Response
<p>or services?</p> <ul style="list-style-type: none"> • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? • Will you support any effort aimed at effectively managing your forest resources? • Do you think the youth will support such? • Why do you think so? 	<ul style="list-style-type: none"> • The laws are obeyed by everybody • No • Yes • Yes • I think so because it will be to our benefit

Place: Akpide-Biseni	Participant: 10
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What type of crops do you farm? • What is the percentage of youth in this community? • What type of jobs do they do? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest 	<ul style="list-style-type: none"> • I am a farmer (Youth Leader) • Plantain (mostly) • About 50% • Most of them are not having paid employment; they do hunting, collection of products from the forest, fishing and sales of items collected from the environment. Some are farmers and fishermen. • Food (ogbono, bushmeat, timber) • They have declined

<p>resources, will you say they are still abundant, declining or threatened?</p> <ul style="list-style-type: none"> • Any reasons for this? • How do you mean? • Is the Akpide (Biseni) forest part of a government forest reserve? • Why are your native laws so powerful? • Will this community be willing to collaborate with other stakeholders for the purposes of managing your forest resources? 	<ul style="list-style-type: none"> • More people are depending on the forest resources more than before • We now sell these forest items to get money (before now, we only harvest for home consumption). So this has helped to increase the rate of harvest and cutting down of the forests. • No • We grow up knowing them and no one challenges them. They are tied to deities. • Yes
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Place: Akpide Biseni	Participant: 11
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • But do you engage in some activities that fetch you money? • What are the activities? • In that case, your source of income is from activities that relate with the environment • Have you noticed any changes in forest resources (resources declining, or increasing)? • Any reasons for this? 	<ul style="list-style-type: none"> • I am not employed (a youth) • Yes. • I pick and sell snails and Ogbono, I do weaving of baskets. • Yes • They are declining • Almost everybody is involved in picking snails and ogbono. Flood

<ul style="list-style-type: none"> • When you pick the snails, do you pick the immature ones as well? • Why is that? Will anyone buy such? • What are the benefits you derive from the forest? • Is the Akpide (Biseni) forest part of a government forest reserve? • Are there any community or native laws that protect certain environmental goods or services? • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? • Will you support any effort aimed at effectively managing your forest resources? • Do you think the youth will support such? • Why do you think so? 	<ul style="list-style-type: none"> • Yes • It adds to my collection. I can eat those ones if I cannot sell them. Others will pick them • At the moment, it is my source of income • No • Yes • The laws are very effective • No • Yes • Yes • It will be to our benefit
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Place: Akpide Biseni	Participant: 12
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What type of crops do you farm in this community? • What type of trading do you do? • If you are to separate your income, what percentage will you say comes from farming? • What will you say is the dependence rate of the women on forest resources? 	<ul style="list-style-type: none"> • I do farming and trading. • Cassava, plantain, yam, maize, okra, cocoyam • I sell produce from the farm and I also buy fish to sell • About 80% • Over 90%

Place: Akpide Biseni	Participant: 12
Question	Response
<ul style="list-style-type: none"> • Why? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • Do you have any alternative sources for these benefits? • Is the Akpide (Biseni) forest part of a government forest reserve? • So, no government laws prevent people from collecting forest products including timber? • Can anybody enter any part of your forest and harvest anything as they want? • Including non-natives? • Do women own lands here? • What about for farming and collection of forest products? • Are there any community or native laws that protect certain environmental goods or services? • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • That is the only source of income • Ogbono (<i>Irvingea gabonensis</i>) • They are reducing • Oil pollution, flooding, population growth • No • No • Yes • Yes • No • No • Yes • Our lakes have laws. • It is very effective • No

Place: Akpide Biseni	Participant: 13
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Which of the two occupies more of your time? • What types of trees are available? • Are there many loggers in this community? • Why is it so? • Do you get more of your income from logging? • What will you say is the average level of dependence of your community people on the forest resources? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • Do you think that some of your actions like farming, hunting, bush burning, cutting down the forest, etc can also be some possible reasons? • Will you support any effort aimed at improving your forest productivity? • Is the Akpide (Biseni) forest part of a government forest reserve? 	<ul style="list-style-type: none"> • I am a farmer but I also do logging of timber • Farming. The logging business is some how seasonal. • There are hardwood and softwood timbers. Iroko, Obeche, Mahogany. • No. It is not a major occupation. • It is not an easy job to do. No roads. You have to saw the timber on site and still find a way of moving them to the roads or waterways. • No. I said it is a seasonal thing. • 100%. There is no person here that does not take something from the forest either for sale or for home consumption. • Timber. • Everything is declining. Nothing is as it used to be anymore. • There are no alternative jobs. Everybody (more people) depends on the forest. • Yes • Yes • No

Place: Akpide Biseni	Participant: 13
Question	Response
<ul style="list-style-type: none"> • Can anybody enter any part of your forest and harvest anything as they want? • Are there any community or native laws that protect certain environmental goods or services? • How effective is this native law? • Are you aware of any government effort aimed at conserving this forest? • Do you think that this community will welcome any idea aimed at effectively managing the forests (including partnering with external stakeholders)? 	<ul style="list-style-type: none"> • No. Only natives can. • Yes • These laws are well respected • No • Yes

Place: Akpide Biseni	Participant: 14
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What will you say is the occupation of most of your people? • What about the collection of products from the forest? • What are the common ones? • What will you say is the average level of dependence of your community people on the forest resources? • Which of the benefits from the forest do you consider the best to you? • In respect of availability of the forest resources, will you say they are still abundant, declining or threatened? • Any reasons for this? • Will you support any effort aimed at improving your forest productivity? • Is the Akpide (Biseni) forest part of a government forest reserve? • Can anybody enter any part of your forest and harvest anything as they want? • Are you aware of any government effort 	<ul style="list-style-type: none"> • I am a farmer and fisherman • Farming and fishing • Yes. We all do it too. • Snails, ogbono, timber, fruits, leaves, medicines • It's difficult to tell because almost everything we do depends somehow on the forest • Ogbono, snails, timber • They are threatened • We all depend on it and it is not growing back in the same way as we are collecting them • Yes. • No • No. • No

Place: Akpide Biseni	Participant: 14
Question	Response
aimed at conserving this forest? • Do you think that this community will welcome any idea aimed at effectively managing the forests (including partnering with external stakeholders)?	• Yes

Place: Akpide Biseni	Participant: 15
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What type of crops do you farm? • What articles do you sell? • Will you say that the forest is important? • Why? • Are these products still abundant? • Why do you say so? • Are there any alternative sources for these benefits? • Do women own lands here? • What about for farming and collection of forest products? • Has there been any time when someone violated the laws governing the lakes and crocodiles? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Farming and trading. • Mostly cassava • Gari (made from cassava), ogbono, snails, fish • Yes • We get many things from the forest (ogbono, wood, firewood, ropes, leaves, medicine, snails) • No • They are becoming more scarce but then, we get more money because their prices are also going up • No • No • Yes, we can • I do not know of any • No

Place: Akpide Biseni	Participant: 16
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What is the occupation of most women in this community? • What about collection of products from the forest? • What are the articles? • What about cane rope (rattan) and hunting? • Is the forest very important? • Are these products you mentioned still abundant? • Why do you say so? • You mean to say that one of the reasons is that more people are now involved in the collection of these products? • Are there local plans aimed at conserving these products e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? • Will the women support a partnership initiative aimed at sustainably managing your forest? 	<ul style="list-style-type: none"> • Farming and trading. • Farming, trading, some engage in fishing as well (but not as the men) • Everybody is involved in that • Ogbono, snails, firewood, leaves, fruits • Not many people are into that here. There are visitors that engage in that. • Yes • No • Even a child knows that they have all reduced. We have to walk far into the forest before we can get some of them; it was not so before now. Before now, men do not use to pick ogbono but they now do • Yes • No • No • Yes

Place: Akpide Biseni	Participant: 17
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What about collection of products from the forest? • What are the articles? • How important will you say the forest is? • Are these products you mentioned still abundant? • Why do you say so? • Why have they declined? • Are there local plans aimed at conserving these products e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? • Will the women support such? 	<ul style="list-style-type: none"> • Farming and trading. • Yes, I do that also • Ogbono, snails, firewood, leaves, fruits, ropes • It is very important • No • We put in more effort to get a sizeable quantity (compared with time past) • Many people are involved now; no other job • No • No Yes

Place: Akpide Biseni	Participant: 18
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What is the occupation of most women in this community? • What about collection of products from the forest, weaving, fishing? • What constitute the articles of trade in most cases? • This means that most of what the women are involved in (economically) has to do with the forest • Are these forest products you mentioned still abundant? • Why do you say so? • Are women allowed to own land here? • What about for farming? • Are there any part of the forest that women are forbidden from entering? • Are there local plans aimed at 	<ul style="list-style-type: none"> • Farming and trading (also a member of the CDC) • Farming and trading • Yes, women are involved as well. Fishing is not very common among the women. Some women do weaving of baskets and fishing traps. • Gari, fish, ogbono, fishing traps, brooms, baskets • Yes • No • They are scarce • No • Yes, we can farm on the family lands • No • No

Place: Akpide Biseni	Participant: 18
Question	Response
<p>conserving these products e.g. not collecting immature snails, etc?</p> <ul style="list-style-type: none"> • Are you aware of any government effort aimed at conserving this forest? • Will the women support such? 	<ul style="list-style-type: none"> • No • Yes

Place: Akpide Biseni	Participant: 19
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Will you say that all of your household income comes from the environment (Rivers, forests)? • How is the timber trade? • How many people are involved in this logging business? • Upon the fact that you complain about absence of equipment, the forest is still in constant decline, do you agree? 	<ul style="list-style-type: none"> • I do fishing and logging • Yes • It is profitable but its much hard work. We do not have modern equipment apart from this type of small motorized saws. • Not many people • Yes

Place: Akpide Biseni	Participant: 19
Question	Response
<ul style="list-style-type: none"> • Why is this so? • What about collection of other products from the forest? • So can I say that the forest is 100% important to your community? • Will you support a situation whereby the forest is properly managed, even if other stakeholders will be involved? • Are you aware of any government effort aimed at conserving this forest? • How is the fishing aspect? Is it also in decline? • So the laws that govern the lakes are good 	<ul style="list-style-type: none"> • Well, they (government, companies) are constructing roads; people are building houses, population is increasing. We cut down the timbers because we need them. The lack of equipment makes it difficult for us. • People collect many other things apart from timber from the forest (Ogbono, snails, firewood, leaves, fruits) • Yes. It is our source of survival. • Yes • No • Yes. The sizes of the fishes are becoming smaller. We only get good catch from our lakes. We always look forward to the lakes being opened for fishing. • Yes. If not for the laws, we will not have fish anymore anywhere

Place: Akpide Biseni	Participant: 20
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Its like most people in this community are farmers and fishermen • But people engage in the collection of products from the forest • Can you mention a few of the products 	<ul style="list-style-type: none"> • Farming and fishing. • Yes. It is our source of income. • Yes. Almost everybody is involved in that • Ogbono, snails, firewood, fruits,

Place: Akpide Biseni	Participant: 20
Question	Response
<p>they collect?</p> <ul style="list-style-type: none"> • So the forest is very important • Do you agree that all resources from this your environment are declining? • But it is your source of income, are there alternatives? • Are you aware of any government effort aimed at conserving this forest? • Will this community welcome an initiative aimed at helping to conserve these resources? • Why? 	<p>bushmeat, medicinal herbs</p> <ul style="list-style-type: none"> • Yes • Yes • No • No • Yes • It will be to our benefit

Place: Akpide Biseni	Participant: 21
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Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What is the occupation of most women in this community? • What about collection of products from the forest? • Are these products you collect still abundant? • Are there alternatives? • Are they becoming more expensive in the market? • Will a management plan be a good idea? • What if other stakeholders will be involved? • How is your farming output? Good, not so good? • Why? • Do you think that cutting down of the forest is also part of the reasons? • Are you aware that your forest is within a government forest reserve? 	<ul style="list-style-type: none"> • Farming and trading. • Farming and trading • Yes, we also collect • No • We now resort to buying some of them from the market. Some are so scarce. • Yes • Yes • So far that it will be to our benefit • The harvest is not as good as it used to be • Oil pollution and gas flaring • I do not know • No

Place: Akpide Biseni	Participant: 22
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Is hunting a major occupation in this community? • What other things do you do? • About hunting, are there so many animals still in this forest? • What about elephants, monkeys, tigers? • Are these animals still abundant? • When do you get more animals? • Why are they now scarce? • Will an initiative to properly conserve these resources be welcomed by the youths? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • I do hunting (Unemployed youth). • No • I collect snails and ogbono. I join to fish as well. • No. Just common animals like grasscutter, african giant rats, antelopes, porcupines • We have chimpanzees in our forest. We used to have elephants too. But I only hunt the common animals (I set traps) • No • When there is flood and the forest floor are covered with water. The animals gather in the remaining few high / dry lands. It becomes easier to hunt them. • Deforestation. Noise (from motor vehicles) is pushing them far into the forest. Also oil exploration activities. • Yes • No

Place: Akpide Biseni	Participant: 23
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What do you do to get income? • So all your income is from the forest? • Do you agree that all the forest resources are declining? • Why are there no native laws protecting the forest resources just like the lakes? • If you are to advise, will you encourage the community to find ways of protecting the forest resources? • What if the method will involve other external stakeholders? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • I am not employed • I farm (assist my mother). I collect ogbono and snails for sale. • Yes • Yes • I do not know. May be because the forests belong to different families. • Yes • It will not matter • No

Place: Akpide Biseni	Participant: 24
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other thing in addition? • What about collection of products from the forest? • Are you of the opinion that all the forest resources are in a decline? • What percentage of your community people depends on the forest? • Are there local plans aimed at conserving these products e.g. not collecting immature snails, etc? • Could this be because the forests belong to different families? • So if there is coordination, will it work? • What if this coordination is coming from outside the community? • • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Fishing • I farm but just for domestic consumption. • Well, materials for weaving fishing traps, firewood, medicinal plants, fruits, bushmeat • Not just in a decline, they are all almost gone. It is becoming increasingly difficult to get them • Almost everybody. Everybody. • None at the moment • I think it is the absence of coordination • I think so • It is still to our advantage. There are projects (water project) in this community that were spearheaded by outside agencies and are doing well • No

Place: Akpide Biseni	Participant: 25
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you benefit from the forest in any other way? • Are these resources still abundant? • Why do you say so? • Why? • Will it be a good plan to conserve these remaining resources? • What do you think might be a hindrance to its success? • Are there local plans aimed at conserving these products e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Farming and fishing. • Apart from farming and fishing, our every other activity is in the forest; we collect firewood, get bushmeat, medicines, etc • No • They have become so scarce • Everybody depends on them for survival. No other source of employment. Oil spillage. • Yes • Cooperation from everybody involved; this will be an important factor • No • No

Place: Akipelai-Ogbia	Participant: 26
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from farming? • What do you benefit from the forest? • What type of things do you get from the forest? • Are they still abundant? • Why do you say so? • What is responsible for this decline in production? 	<ul style="list-style-type: none"> • Farming (member of the CDC) • I do fishing but not much • Food; our food comes from the forest • Meat, snails, ogbono, palm wine, palm fruits (for oil), medicines, many things. All we use comes from the forest • They have declined in quantity and size • We put in so much effort now to get a sizeable quantity for the family • Oil exploration activities

Place: Akipelai-Ogbia	Participant: 26
Question	Response
<ul style="list-style-type: none"> • What percentage of your sustenance comes from forest? • What about the community, how much do they depend on the forest? • Are there alternatives to these declining resources? • Will it be a good plan to conserve these remaining resources? • Are you aware of any government effort aimed at conserving this forest? • Is the Akipelai forest part of a government forest reserve? • What is the name of the forest reserve? • Are there government rules preventing you from entering the forest to take forest products? • Are there native laws protecting forest resources? • Do women own lands here? • But can they farm and collect forest products? • Will this community welcome an initiative to help conserve the forest resources? 	<ul style="list-style-type: none"> • Almost 100%. 100% • All of our activities are dependent on the forest (materials for building, canoe carving, food, etc; all comes from the forest) • No. We keep struggling to make ends meet. Life is becoming more difficult because of these changes (low productivity of environmental goods) • Yes • No • Yes • I don't know • No • Yes. There are laws regarding felling of wood and hunting. Natives are allowed free entry and collection; but the laws apply more to non-natives. • No • Yes • Yes

Place: Akipelai-Ogbia	Participant: 27
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from hunting? • What do you benefit from the forest? • Are they still abundant? • Any alternatives? • Are you aware that this forest is part of 	<ul style="list-style-type: none"> • Hunter (member of the CDC) • I collect snails • Snails • Seriously decreasing • No • No

Place: Akipelai-Ogbia	Participant: 27
Question	Response
<p>a government forest reserve?</p> <ul style="list-style-type: none"> • What percentage of the community depends on the forest for survival? • Why do you say the resources are declining? • Why have they declined? • How is land and forest resources owned here? • Are there any forests that are protected by community laws? • How is it called? • What are the laws? • How well do people obey these laws? • Has there been any incidence of breaking of these laws? • Will it be a good plan to conserve these remaining resources? • Why will you be interested in conserving the forest resources? • How important is the river to the 	<ul style="list-style-type: none"> • 100% • The sizes are smaller and we now go further into the forest to get snails • Pollution • Families own it. It is the family that sells land. Anybody can enter any part of the forest to collect forest products (but not non natives). You cannot fell timber on another person's land but you can hunt in any part of the community's forest. • Yes. They are sacred forests and people are forbidden from entering there to do certain things. • <i>Eledum</i> (forbidden forest) • No one cuts trees or farm in these areas. But you can hunt. There are also creeks where we do not fish until certain periods (3-4 years). It is called <i>Obatubo</i> creek. The priest is called <i>Aduein</i>. In the <i>Obatubo</i> creek, you can fell trees but cannot fish. A ritual must be performed before fishing is allowed. Even if a fish jumps into your canoe, you have to throw it back into the creek. • Very well • No • Yes • We depend on it for survival • We do fishing there; it is also our source

Place: Akipelai-Ogbia	Participant: 27
Question	Response
<p>people?</p> <ul style="list-style-type: none"> • I saw that it is also a means of transportation (lots of canoes and speed boats) 	<p>of water for domestic use</p> <ul style="list-style-type: none"> • Yes, you are correct. There is no household that does not own at least, one canoe. This is used to go to farm, fishing, local travels to other communities. The speedboats are for commercial purposes.

Place: Akipelai-Ogbia	Participant: 28
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from fishing? • What do you benefit from the forest? • Are they still abundant? • Why do you say so? • Does this community depend entirely on the environment for survival? What percentage will you give to this? • What do you think might be responsible for the declining timber and other farm produce? • Is there any government law restricting the community from taking products from the forest? • So the Akipelai forest is not part of any government forest reserve? • Will it be a good plan to conserve the forest resources? • Are you aware of any government effort aimed at conserving this forest? • How is land owned here? 	<ul style="list-style-type: none"> • Fishing (Youth leader) • No • Palm fruits and timber (iroko tree) • Palm trees are still abundant but the timber has reduced • People do not cut down palm trees here because of its importance. Palm oil production is very important here. Other timber trees can be cut down but palm trees are not cut down. People also protect the germinating ones so that they grow unto maturity. • Yes. 99%. • Oil pollution. Acid rain. Increased population. More people getting involved (in harvesting forest produce). • No • No, it is not • Yes • No • It is owned by families (different portions of the community's land is owned by different families).

Place: Akipelai-Ogbia	Participant: 28
Question	Response
<ul style="list-style-type: none"> • Do women own lands here? • But they are able to farm on family lands, enter the forest freely and collect forest products • Is Akipelai a part of the Shell GMoU? • Does Shell operate here? • Are they doing well in terms of projects? Any conflict issues with Agip? 	<ul style="list-style-type: none"> • No • Yes • No. • No. Its mainly Agip (Nigerian Agip Oil Company, NAOC) • Yes. They have provided us with some projects (Health centre, water, school building, internal roads) • No

Place: Akipelai-Ogbia	Participant: 29
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from fishing? • What do you benefit from the forest? • Are they still abundant? • Why do you say so? • What caused this? • What has replaced <i>Amasi</i>? • What do you think about your wildlife, do you think they are still abundant? • Why? • What percentage of the income of the Akipelai people come from the forest? • Will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a 	<ul style="list-style-type: none"> • Fishing (Youth leader) • I farm • The food we eat comes from the forest • They are reducing • Some of our foods are not producing well anymore. <i>Amasi</i> is now extinct (a variety of cocoyam and a staple food of the people). It became extinct in the year 2011. Plantain (another economic crop) is also reducing very much in production. • Pollution and chemicals in the atmosphere (so we heard) • A red variety of cocoyam is now grown. Yam does not grow here • No. They have reduced. • The hunting has increased. The hunters have increased. • 95%. We depend entirely on the forest for survival. • Yes • Yes

Place: Akipelai-Ogbia	Participant: 29
Question	Response
<p>conservation plan?</p> <ul style="list-style-type: none"> • What if external stakeholders will be involved? • Why do you think so? • Are there local plans aimed at conserving these forest resources e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? • How effective are your native laws concerning some forest resources? 	<ul style="list-style-type: none"> • It will still be okay • The dwindling resource is affecting everybody. We no longer get as much as we used to get from our environment. Any effort that helps to resolve this will be welcomed. • None at the moment • No • They are very effective

Place: Akipelai-Ogbia	Participant: 30
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What do you farm? • What has happened to <i>amasi</i>? • What has replaced it? • Do you miss it? • What do you think was responsible for this? • Do people engage in collection of forest products here? • Can you mention some? • Do you think these items are still abundant? 	<ul style="list-style-type: none"> • I am a trader and a farmer (Women leader) • Cassava, maize, okra, pumpkin • It no longer grows here • In its place, we now have another variety of cocoyam, the red one • <i>Amasi</i> was a delicacy here (we eat and sell it) • Oil spillage. Pollution. • Yes • Ogbono, leaves, snails, medicines, meat, palm fruits, materials for roofing and building • No. They are not abundant anymore.

Place: Akipelai-Ogbia	Participant: 30
Question	Response
<ul style="list-style-type: none"> • Why do you say they have declined? • How has this affected the price of these products? • Does this mean more income to you? • So living in the village is no longer as cheap as it used to be? • But what percentage of your income will you say comes from these environmental activities? • What do you sell? • What is the dependence level of people of this community on the forest resources? • How effective is the law that guards the <i>eledum</i> forest and <i>Obatubo</i> creek? • Has there been any known case of someone defaulting? • Are there any government laws preventing the Akipelai people from entering any part of your forest and to collect products? • Will it be good to plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • How do you think the people will perceive the involvement of external stakeholders? • I observe that the canoe is a major means of transportation here 	<ul style="list-style-type: none"> • The quantity we see is not much anymore compared to the effort we put in. Their sizes have also reduced. • They have become more expensive in the market. • Well, yes. But you still have to spend the money on other items. It goes round in a cycle. The cost of living has increased. • Yes • I do not have any other source. 100% • Ogbono, fish, cassava, maize, snails, etc • Over 90% • They are very effective. No one goes against it. • No • No • Yes • Yes • Will it not be for our good? • Yes. We do not have vehicles. We rely on our canoes to go everywhere (farm, neighboring villages, etc)

Place: Akipelai-Ogbia	Participant: 30
Question	Response
<ul style="list-style-type: none"> • There are motorized boats as well 	<ul style="list-style-type: none"> • Yes. Those are commercial ones. Some of them are used to go for fishing as well.

Place: Akipelai-Ogbia	Participant: 31
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What is the main occupation of the women here? • So most of your occupation has to do with the forest and the rivers 	<ul style="list-style-type: none"> • Farming and trading • Farming, trading, weaving, collection of snails, periwinkles, etc • Yes

Place: Akipelai-Ogbia	Participant: 31
Question	Response
<ul style="list-style-type: none"> • How important is the forest to this community? • But has the government not made this your forest into a reserve? • How do you see the laws guarding the <i>Eledum</i> forest and the <i>Obatubo</i> creek? Do you think it is depriving people of needed resources? • So it is beneficial • Why? • Why are the laws so very much obeyed? • From what you have said, it means that the resources have greatly declined in other areas not protected by these native laws? • If conservation plans are to be made for all the forest areas, do you think people will agree to it? • Why do you say so? • Why has some crops gone extinct? 	<ul style="list-style-type: none"> • It is very important. We depend on it. • No. It is not a government forest. • No. It is in our favour. We still do things (fish, harvest products) there but just that the laws stipulates when and how to collect things from there. • Yes • As at present, those are the only places we get very good harvest (whenever it is opened for exploitation). We look forward to it. • It has become a way of life here; we do not struggle to obey it. It is tied to our tradition. We grow up to meet it and we transfer it to our children. No one questions it. • Yes • Yes • We want better availability of the products. If that plan will guarantee it, then it will be welcomed • Oil pollution. Acid rain.

Place: Akipelai-Ogbia	Participant: 32
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What do you sell? • So, what percentage of your income will you say comes from the forest? • Now that some crops are extinct and the productivity of others has declined, what impact does it have on your livelihood? • What may have caused this decline and extinction? • Do you think over-exploitation of the resources can be a reason? • Why do you have better harvest in the <i>Eledum</i> forest and <i>Obatubo</i> creek? • Do you think the people will welcome a conservation plan? • Are there local plans aimed at conserving these forest resources e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Farming and trading • Different things. It depends on the season. Ogbono, snails, leaves, baskets, fishing gears, farm produce • 99% • It has made life more difficult. Diseases are increasing. Things have become more expensive. You have to do so much to get the little that keeps you going. • Pollution. Oil spills. • We have to exploit it. It is our source of income. We are exploiting it so much because it is how much you exploit that translate to how much money you have. • It's because we do not go there every day. But if we convert all of our forests and creeks into forbidden places, where do we get our daily food? • Yes. So far as it will not stop our daily bread. • No • No

Place: Akipelai-Ogbia	Participant: 33
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from hunting? • What do you benefit from the forest? • Are they still abundant? • How do you know this? • What may have caused this? • What are the common animals that you hunt? • Does all your income come from hunting and farming? • Is this forest part of a government forest reserve? • Are there some local laws preventing you from hunting in some parts of your forest? • Will it be a good plan to conserve these forest resources? • Do you think the people will welcome a conservation plan? • What are the major occupations of people in this community? 	<ul style="list-style-type: none"> • Hunting • Farming • Bushmeat, wine (palm wine), medicines, building materials, wood, firewood • No • I am a hunter and the bushmeat has become so scarce to get unlike before. • There are more people entering into the forest. Roads construction has caused so much of noise and has chased the animals far into the thicker forests. • Grasscutter, porcupines, antelopes, monkeys • Yes • No • No. The laws control the felling of trees and fishing. • Yes • Yes • Farming, fishing, palm oil production

Place: Akipelai-Ogbia	Participant: 34
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you benefit anything from the forest? • Can you mention some of them? • Are they still abundant? • What about your fishing, is the catch still good? • What caused this decline? • What percentage of the income of the Akipelai people come from the forest? • Will it be a good thing to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • What if external stakeholders will be involved? • Are you aware of any government effort aimed at conserving this forest? • Do you fish in the <i>Obatubo</i> creek? • Anytime you want to? • Do people really keep to this rule? • What happened to the person that broke this rule? 	<ul style="list-style-type: none"> • Fishing • Yes. Every other thing I use comes from the forest • Materials used in doing some of my fishing gears come from the forest, wood, palm oil, horney, bushmeat • No • No • Population increase, oil exploration activities • 95% • Yes • Yes • It will not be a problem if they are not taking our forests away from us. • No • Yes • No. We fish there only after four years (cycle of four years) • Yes. It is part of our tradition. Nobody goes there to fish unless the priest has performed the necessary sacrifices to open the creek for fishing. • I do not know of any; we do not break this rule; even visitors are made to be aware as soon as they settle in the community

Place: Akipelai-Ogbia	Participant: 35
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from this? • Is the timber still abundant? • What has happened? Why is this so? • Do you think that a management plan for the forest will be beneficial? • Why do people obey the traditional laws guarding the <i>Eledum</i> forest and the <i>Obatubo</i> creek? • Is there any government law controlling access to any forest resources that you know of? • Why do people harvest everything they are able to harvest from the forest without planning for the future needs? • But the manner in which the resources are harvested is affecting the availability of the resources and might be becoming worse • So if there are laws that everybody respects, will it help? • Are there many people involved in lumbering work here? • Is the income not much? • What percentage of your income comes from the forest? 	<ul style="list-style-type: none"> • Lumbering • Yes. I farm and fish (depending on the season) • No • The demand for wood is increasing; building of houses, carving of canoes and other items such as mortars, pestle, masks, drums, etc • Yes • It is part of us. We do not struggle to obey it. We believe it is for our good. • No • We need to survive today before we think of tomorrow • Yes. But if you leave any one behind, the other person will harvest it • Yes • No • The income is good but the work is difficult. Not many people will want to do it. • 100%

Place: Akipelai-Ogbia	Participant: 36
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you also farm and fish? • Why then did you say that you are a logger? • Apart from timber, what other benefits do you get from the forest? • Are they still abundant? • Why? • Will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • What if external stakeholders will be involved? • Are visitors allowed to enter into your forest to harvest forest products? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Logging • Yes • I do farming and fishing to get my daily food but it is logging that gives me money • Palm fruits, medicines, palm wine, bushmeat, firewood, leaves, snails, ogbono • No • Everybody depends on these resources and population has increased. Also, because of oil exploration activities. • Yes • Yes • Well, if we are the ones to benefit, I do not see any problem with that • Yes, but such a visitor must seek the approval of the Chiefs. • No

Place: Akipelai-Ogbia	Participant: 37
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What do you trade on? • How do you get them? • How has their prices been over the years? • Why? • Why will the prices of commodities collected from inside your own forest be increasing? Were they not collected free? • So these commodities from the forest have become scarce? • Will you also say that as a result of their scarceness, their values have increased? • Will you say that your survival is dependent on the forest? • Do you have any other alternatives? • Will it be a good plan to conserve these forest resources? • Are you aware of any government effort aimed at conserving this forest? • Why are your native laws well respected? 	<ul style="list-style-type: none"> • I am a trader • Fish, ogbono, leaves, palm oil, snails, bushmeat • I buy from people and also collect some from the forest • They are no longer as cheap as they used to be • The price of everything has gone up. Inflation. • The quantities that are available are decreasing and they are becoming more difficult to get. Sometimes, we have to pay in advance before the products are supplied. • Yes • Yes • Yes • No • Yes • No • It is a taboo to go against them. It is a part of our upbringing.

Place: Akipelai-Ogbia	Participant: 38
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Apart from trading, do you do any other work? • Is the forest important to you? • Why do you say so? • What do you think about their availability? Are they still abundant? • What do you think may have caused this? • What percentage of the income of the Akipelai people come from the forest? • Do you think the people will welcome a conservation plan that involves other stakeholders? • Are there local plans aimed at conserving these forest resources? • Are you aware of any government effort aimed at conserving this forest? • How effective are your native laws? 	<ul style="list-style-type: none"> • Trading • Depending on the season, yes. We all farm, fish, etc. We do little little of every other thing. • Yes • All we survive by comes from the forest • No. • Population. Oil pollution. • We all depend on the forest. There are no other sources of employment here. • Yes • No • No • They are well obeyed

Place: Akipelai-Ogbia	Participant: 39
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do just this all year round? • Are the palm trees still abundant? • Why are they still abundant when other resources are declining? • Does it mean that there is much income from palm oil business? • What percentage of the people are palm fruit cutters? • So will you say that your economy depends on the forest? • Are there some other benefits you derive from the forest? • Why are these ones declining in availability? • Will it be a good plan to conserve these declining forest resources? • Do you think the people will welcome a conservation plan? • What if external stakeholders will be involved? • Are you aware of any government effort 	<ul style="list-style-type: none"> • I am a palm cutter (Palm oil production) • It is a tasking job but there are peak and off-peak seasons. I engage in fishing during the off-peak period. • Yes • The palm tree is a highly valued tree in this community. People do not cut down palm trees except it is no longer bearing fruits. People protect the ones on their farms. We guard the sprouting ones. We are also engaging in planting of palms. • Yes • Almost every able-bodied adult male harvests palm fruits in this community. The women engage in selling the final products. The kernel and chaff are also sold. 70% • Yes, the palm grows in the forest • Yes. Ogbono, snails, bushmeat, timber • Unlike the palm trees, once these ones are collected, it is not replaced. Pollution. • Yes • Yes • No problem • No

Place: Akipelai-Ogbia	Participant: 39
Question	Response
<p>aimed at conserving this forest?</p> <ul style="list-style-type: none"> • But your native laws are well obeyed • Why is this so? 	<ul style="list-style-type: none"> • Yes • They are tied to our customs, traditions and deities.

Place: Akipelai-Ogbia	Participant: 40
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from this? • Do you benefit from the forest? • What are other benefits? • Do you think they are still abundant? • Why? • What percentage of the income of the Akipelai people come from the forest? • Do you think the people will welcome a conservation plan? • What if external stakeholders will be involved? • Are there any local plans aimed at conserving these forest resources e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Palm fruit cutting • I farm • Yes. I am a palm fruit cutter • Palm wine, snails, bushmeat, medicines, building materials, timber • They have reduced. • The collection is on the increase and they are not being cultivated • 95% • Yes • It will still be okay. We are used to having external agencies coming to do things here • No • No

Place: Akipelai-Ogbia	Participant: 41
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What is the importance of this mangrove forest to you? • Do you know about its importance in making fishes available? • Is the mangrove still abundant? • Why is it so? • So do you depend entirely on your natural environment for survival? • Are there laws that control fishing here? • What about the <i>Obatubo</i> creek? • What is the benefit from this practice? • So fishing in other creeks does not bring 	<ul style="list-style-type: none"> • Fishing • We use it as firewood (drying our fish and cooking). It is a major source of domestic fuel • Yes. That is where we fish. We fish along the creeks and the creeks are lined with the mangroves. • Yes • It is plenty (extensive). It is not exploited for commercial purposes but for domestic use. • Yes • Chemicals are not allowed here although people still hide to use it. • We only fish there every four years. It is forbidden to fish there except the necessary sacrifices have been offered. • We get good catch from there when we fish. We all look forward to it. • No, it does not

Place: Akipelai-Ogbia	Participant: 41
Question	Response
<p>as much?</p> <ul style="list-style-type: none"> • Why? • What do you think may have caused the decline of fishes in the rivers? • Will you welcome a conservation plan? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • It is difficult to get a good catch. The fishes are no longer there. Before now, we do not buy iced fish in this community. But selling of iced fish is now a business here because of the lack of fish in the rivers. • Over-fishing. The use of chemicals. Oil pollution. Oil exploration activities. • Yes • No

Place: Akipelai-Ogbia	Participant: 42
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • How is the selling of iced fish here? Do people prefer it to the fresh fish from the rivers? • So do you sell iced fish? • What do you sell? • Do you miss <i>amasi</i>? • Why? • Is the forest very important to you? • How important is it? • Can you mention a few benefits? • How are these resources? Are they still abundant? • What do you think may happen if this declining trend is allowed to continue? • In that case, will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Trading and Farming • It has become a good business here just because the fishermen no longer get enough from the rivers. We still prefer the fresh fish from the rivers. It is the absence of the fresh river fish that has made us to resort to eating iced fish. • No. There are traders that go to the city to buy and then come here to sell. • Ogbono, fish (river fish), palm oil, snails (depending on the season) • Yes. It no longer grows here • I do not know. May be oil pollution. • Yes • Our survival is dependent on the forest • Food, medicines, money (from the sales of forest items) • No. Not as it used to be. • We may not have anything to live on • Yes • Yes • No

Place: Akipelai-Ogbia	Participant: 43
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you sell iced fish? • Does it compare favourably with the fish from your rivers (demand, taste, income)? • Why has the fishes declined in availability? • But people also use chemicals to fish and this destroys the fish population • Do you agree that chemicals also contribute to destroy the fish population? • Do people use chemicals in the <i>Obatubo</i> creek? • What other benefits do you derive from the forest? • Are they still abundant? • Will the people allow a conservation plan? • What percentage of your income comes from the forest and river? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Trading and farming • Yes • It was not a part of our meals here before now. It's because of the scarcity of fish from the rivers (the catch is no longer enough for family and for sales). We now prefer to sell the catch from the river (it brings more money). The iced fish is cheaper for domestic consumption. • It is oil pollution. • The use of chemicals is recent and it's because we can no longer get enough by our normal native methods. The chemical helps to get more catch • Yes. But there is law against fishing with chemicals. People only do it secretly. • No. • Firewood. Timber. Leaves. Medicines. Bushmeat. Chewing stick. Palm wine. Palm oil. • No. They have all reduced in availability. • Yes • About 80% • No

Place: Akipelai-Ogbia	Participant: 44
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you do any other work apart from trading? • What do you benefit from the forest? • Are they still abundant? • Why do you say so? • What caused this? • How has this affected food availability in the community? • What percentage of the income of the Akipelai people come from the forest? • Will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • Are there local plans aimed at conserving these forest resources e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Trading • Depending on the season, yes • Ogbono, snails, palm oil, leaves, building materials, timber, firewood • No • The quantities have declined. We pay more for less quantity now • It is oil pollution (activities of oil exploration companies) • The price of food has increased. Poverty is increasing. Disease is more frequent. • Almost 100% • Yes • Yes • No • No

Place: Akipelai-Ogbia	Participant: 45
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Do you plant <i>amasi</i>? • What do you benefit from the forest? • Are they still abundant? • Why do you say so? • What may have caused this? • What percentage of the income of the Akipelai people come from the forest? • Will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • Will it be a problem if external stakeholders will be involved? • Why do you think so? 	<ul style="list-style-type: none"> • Farming • It no longer grows here but it was a chief farm produce of the women • Food, bushmeat, ogbono, medicines, palm oil, firewood, timber, chewing stick • They are reducing • We no longer get them as they used to be before now • Pollution and chemicals in the atmosphere • 95% • Yes • Yes • No • We are the ones to benefit (it is our forest)

Place: Akipelai-Ogbia	Participant: 45
Question	Response
<ul style="list-style-type: none"> • Are there local plans aimed at conserving these forest resources e.g. not collecting immature snails, etc? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • No • No

Place: Akipelai-Ogbia	Participant: 46
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Was <i>amasi</i> an important crop here? • What happened? Why did it go extinct? • Are there benefits you derive from the forest? • Are they still abundant? • How has this affected the Akipelai people? 	<ul style="list-style-type: none"> • Farming • Yes but we no longer have it • It started to reduce in yield until it finally stopped to grow. We think it has to do with oil exploration issues. Other farm produce are also reducing drastically in yield. • Yes. Ogbono, leaves, chewing stick, firewood, timber, snails, bushmeat, wine (palm wine), palm oil • No • It has affected us so negatively. The cost of everything has gone up so much. Things are expensive now (more than

Place: Akipelai-Ogbia	Participant: 46
Question	Response
<ul style="list-style-type: none"> • Are there no alternatives? • What about the iced fish and the red cocoyam? • Will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • Will it be a problem if external stakeholders will be involved? • Are you aware of any government effort aimed at conserving this forest? 	<p>before)</p> <ul style="list-style-type: none"> • No • They are not what we were used to having; we are beginning to adapt to the changes • Yes • Yes • No • No

Place: Akipelai-Ogbia	Participant: 47
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Is that all you do? • What do you benefit from the forest? • Are they still abundant? • Why do you say so? • What may have caused this? • Are there many hunters here? • Why is it so? • Do you hunt in the <i>eledum</i> forest? • Why is it so dreaded? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Hunting • I do fishing. I farm plantain as well. • Money (realised from the sales of the bushmeat). Medicines. Timber. Firewood. • No • They were more abundant when I was younger • Population growth. Oil pollution • No • Hunting is not a major occupation here. We are more of palm fruit cutters, farmers and fishermen • It is a forbidden forest although you are allowed to hunt in it (but not to cut down trees). I do not go there to hunt. The forest is dreaded. • It is tied to our deities • No

Place: Akipelai-Ogbia	Participant: 48
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What types of products do you produce? • How much income does this fetch you? • So you do not do any other work? • The wood you use, are they still abundant in the forest? • Will you support a conservation plan? • Do you think the people will welcome a conservation plan? • Will it be a problem if external stakeholders will be involved? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Wood worker (carving) • Canoe, mortar, pestle, paddles • I keep my family with the income I get from this trade • No. The work is tasking. Demand is high. Not many people do this work. • The right types of wood are becoming scarce. I now resort to other types of wood which are more readily available (not the first choice timber) • Yes • Yes • No • No

Place: Akipelai-Ogbia	Participant: 49
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • Where do you sell your timber? • So, it depends on who is making the orders? • Do you do any other work? • Are the forest resources still abundant? • Why is this so? • Do you think the forest is very important to the people in this community? • Do you think the people will welcome a conservation plan? • Will it be a problem if external stakeholders will be involved? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Logger • People make orders before I go to look for the timber • Yes • I collect forest products when I am out for logging (bushmeat, snails, leaves, firewood) • No • Population increase • Yes, very important • Yes • No • No

Place: Akipelai-Ogbia	Participant: 50
Question	Response
<ul style="list-style-type: none"> • What is your occupation? • What are some of the big animals in your forest? • Are these animals still there? • Why have they become scarce? • How has this affected your income? • But are your other activities related to the environment? • Will it be a good plan to conserve these remaining resources? • Do you think the people will welcome a conservation plan? • Will it be a problem if external stakeholders will be involved? • Are you aware of any government effort aimed at conserving this forest? 	<ul style="list-style-type: none"> • Hunting • Chimpanzees, Gorilla, Elephants, monkeys, leopard • We still see signs of their presence but hardly can you get them • Noise (from urbanisation; vehicles, roads, speed boats; sawing machines, oil exploration activities) • It makes everyone to look for additional things to do in order to get extra income • Yes. There are no other sources of income here in the village • Yes • Yes • No • No

Appendix C : Interview transcripts (Government agency: forestry department)

Place: Yenagoa	Participant: 51 (Forestry Dept.)
Question	Response
<ul style="list-style-type: none"> • What types of lands or forests are constituted into a forest reserve? • What is the procedure? 	<ul style="list-style-type: none"> • Lands that can be constituted as forest reserves are lands at the disposal of the government and lands of which the forest growth are threatened • The procedure include: <ol style="list-style-type: none"> a. Visit by Forestry officials to the Forest reserve host communities to enlighten them of the need to constitute Forest reserve b. At least three (3) times meeting of government officials and the Forest reserve host communities c. Publication in the gazette a notice; <ul style="list-style-type: none"> ✓ Specifying the situation and the limits of the lands ✓ Declaring that it is intended to constitute the lands as forest reserves, either for the general purposes of the government, or for a particular use and benefit ✓ Appointing an officer, “Reserve Settlement Officer” to inquire into and determine the existence, nature and extent of any rights, claimed by or alleged to exist in favour of any people or community d. Upon the completion of the inquiry, the Reserve Settlement Officer shall submit to the Director of forestry for the consideration of the commissioner, his findings, describing the limits of the laws specified in the publication and setting forth, with all such particulars as may be necessary to define their nature, duration, incidence and extent, all claims and alleged rights preferred or brought to his knowledge in respect of the lands and admitting or

Place: Yenagoa	Participant: 51 (Forestry Dept.)
Question	Response
	<p>rejecting the same wholly or in part.</p> <p>e. The Commissioner may extinguish any such rights or claims and shall either give monetary compensation or grant in exchange for similar right on any similarly situated land either within or without the final boundaries of the forest reserve if such right would stultify the objects of the proposed forest reserve.</p> <p>f. The Commissioner shall, thereupon, publish a notice in the gazette specifying;</p> <ul style="list-style-type: none"> ✓ The lands which it is finally intended to constitute a forest reserve ✓ The rights which may be exercised within the proposed forest reserve
<ul style="list-style-type: none"> • What laws govern the conservation areas? 	<ul style="list-style-type: none"> • Harvesting of forest produce is prohibited except with the authority in writing of a Forest officer, not below the rank of Forest Officer II. • Other prohibitions include: <ul style="list-style-type: none"> ✓ Uproots, burns, strips off the bark, or leaves from, or otherwise damages, any tree in a Forest reserve is an offence ✓ Sets fire, to any grass or herbage without taking due precaution to prevent its spreading ✓ Pastures cattle ✓ Digs, cuts or cultivate the soil or makes a farm or plantation ✓ Trespasses in any part of a forest reserve ✓ Resides or erects any building ✓ Hunts or fishes without the authority in writing, of a forest officer ✓ Damages, in any way, or destroys any forest property in a forest reserve
<ul style="list-style-type: none"> • What provisions are there for the host communities? • Has there been any kind 	<ul style="list-style-type: none"> • Right of free permit to farm, fish, hunt, collection of minor forest produce, fuelwood, and harvesting of timber for community project • Communal conflicts; Land boundaries; Restriction on

Place: Yenagoa	Participant: 51 (Forestry Dept.)
Question	Response
<p>of conflicts and what have been the main causes?</p> <ul style="list-style-type: none"> • Any lessons learnt? 	<p>illegal exploitation of undersized timber trees and endangered wildlife species</p> <ul style="list-style-type: none"> ✓ Yes. Non-payment of monetary compensation to land owners has always jeopardised constitution of Forest reserves

Place: Yenagoa	Participant: 52 (Forestry Dept.)
Question	Response
<ul style="list-style-type: none"> • What informed the constitution of the Taylor Creek and Edumanom forests as reserves? 	<ul style="list-style-type: none"> • The biodiversity value of Edumanom and Taylor Creek Forest reserves are universally recognised because of the Niger Delta Red Colobus (<i>Procolobos epieni</i>) monkey which is classified by IUCN as critically endangered and is currently 25th most endangered primates. • The Taylor Creek and Edumanom Forest reserves also stock some valuable economic timber tree species such as: <i>Miletia excelsa</i> (Iroko), <i>Khaya spp</i> (Mahogany), <i>Nauclea diderrichii</i> (Opepe), <i>Azelia spp</i> (Apa), <i>Terminalia ivorensis</i> (Black afara), <i>Mitragyna ciliata</i> (Abura), and <i>Lovoa trichiloides</i> (walnut) • Other objectives of managing the two forest reserves are: <ul style="list-style-type: none"> ✓ To ensure effective conservation of endangered and endemic fauna and flora species e.g. Elephants, Hippopotamus, Crocodiles, Chimpanzees and <i>M. excelsia</i>, <i>K. ivorensis</i>, <i>M. ciliate</i> etc.

Place: Yenagoa	Participant: 52 (Forestry Dept.)
Question	Response
	<ul style="list-style-type: none"> ✓ Cane (rattan) production ✓ Fish production ✓ Fruits and vegetable production ✓ To offer employment opportunities to the host communities ✓ To provide opportunities for community development, recreation and tourism ✓ To ensure full multiple use of forest on a sound environmental basis
<ul style="list-style-type: none"> • What have been the major challenges in managing these reserves? • What is the benefit of the recent upgrade of these reserves into the status of a National Park? • Do you think that a participatory management approach will yield better results? I mean a process whereby host communities and other relevant stakeholders are involved. 	<ul style="list-style-type: none"> • Inadequate funding. Poaching. Illegal exploitation of the forests. Farming activities • Upgrading of the two forest reserves to national park has become necessary in order to increase funding. The two forest reserves have remained forlorn hence there is urgent need for the Federal government to take proper management of these reserves for sustainable development. • I think so. Yes

Appendix D : Interview transcripts with key informant stakeholders

Place: Yenagoa	Participant: 53 (Shell Petroleum Development Company of Nigeria)
Question	Response
<ul style="list-style-type: none"> • I am interested in knowing: <ul style="list-style-type: none"> ✓ SPDC’s efforts aimed at conserving the natural environment ✓ Approach for handling communities’ requests ✓ Impact of exploration activities on the livelihoods of the host communities • How is this managed? I mean is there a structure? • Will you say this has yielded results? 	<ul style="list-style-type: none"> • Well, SPDC has recently developed the Global Memorandum of Understanding (GMoU) through which all such issues are now handled. The model is an approach to social investment designed to allow Clusters of Communities take ownership of their own development. The GMoU is a comprehensive agreement that governs the relationship between the communities within a Cluster and SPDC over a 5-year period. When effectively implemented, this process will assist every GMoU Cluster and its constituent communities, to develop the capacity to own and manage their own development programs. The delivery of the GMoU is guided by fundamental principles of sustainable development and good governance. • There are Community Trusts (CTs) and Cluster Development Boards (CDBs) set up to manage the entire process; SPDC provides bulk funds to them to manage but the clusters come up with their priorities for the 5year period. They are free to implement what they consider most important to the community. Some NGOs are engaged by SPDC to act as mentors to these clusters. • Yes. The communities are happier with

Place: Yenagoa	Participant: 53 (Shell Petroleum Development Company of Nigeria)
Question	Response
<p>Reduced conflict situations?</p> <ul style="list-style-type: none"> • What about the natural environment, is it taken care of under this arrangement? • Are you able to know if this is considered as a priority by the clusters? • How inclusive is this GMoU? I mean how much are people carried along in decision-making and implementation? 	<p>this approach. They are in control of their development processes.</p> <ul style="list-style-type: none"> • Yes. It is one of the core principles of the GMoU; the 6th principle talks about environmental sustainability and conservation. • Well, the prioritisation is in their hands but it is inculcated already into the ideas of the GMoU • Every human being has the right to participate in decision-making and implementation of development decisions that affect his or her wellbeing. The implementation of the GMoU promotes inclusiveness at all levels of the society, specifically through: <ul style="list-style-type: none"> ✓ Ensuring the involvement of women, youth and the poorest in all decision-making, planning and project implementation activities. Each project or activity has to take into account the needs of the various segments of the community. ✓ Engaging women, youth, non-indigenes, the elderly and other minority and vulnerable groups in the community in the community development process. To ensure appropriate representation of women in the CTs, CDBs and project committees, women occupies at least one of 3 key positions in the CT; Chairman, Secretary or Treasurer. ✓ Ensuring the right of every member

Place: Yenagoa	Participant: 53 (Shell Petroleum Development Company of Nigeria)
Question	Response
<ul style="list-style-type: none"> • Can the CTs and CDBs partner with other stakeholders for purposes of bringing improvements to the livelihoods of the people? 	<p>of the community to be represented by his / her peers in the decision-making and GMoU implementation structures of the community. The CTs and CDBs ensures that all segments and groups in the community / cluster are represented in the decision-making process.</p> <ul style="list-style-type: none"> ✓ Involving existing community interest groups through all steps of the participatory planning cycle as a means of encouraging ownership by the communities, and making them take pride in their accomplishments and self-reliance. ✓ CTs and CDBs works with the existing, recognized and respected traditional structures to mobilize, inform and invite the different segments of the community (women, youth, fishermen groups, etc.) <ul style="list-style-type: none"> • Yes. Partnering and cooperation with other development stakeholders is a key driver and can be used as a tool to maximise resources and establish mutually beneficial interventions where feasible.

Place: Yenagoa	Participant: 54 (Self Help and Rural Development Association, SHERDA)
Question	Response
<ul style="list-style-type: none"> • You are one of the Mentoring NGOs for the Shell GMoU • Will you say that this model has been a success? • The 6th principle of the GMoU talks about environmental sustainability and conservation, have community people been able to include their natural environment in any of their plans? I mean, to plan for the conservation of natural resources e.g. forests? • So communities have not consciously planned for the conservation of the forests but more on needed infrastructures 	<ul style="list-style-type: none"> • Yes • Yes. It is a big success story. There is more peace between the communities and Shell; communities are now fully in charge of their own development; there is now a healthy rivalry between the host communities as each wants to be seen to be doing well (better than their neighbours) • Well this principle only ensures that whatever project is being planned or executed by the communities does not in any way impact negatively on the natural environment. It does not remedy past damages and was not intended to remedy past damages. • Yes

Place: Yenagoa	Participant: 55 (Anpez Centre for Environment and Development)
Question	Response
<ul style="list-style-type: none"> • You are a Mentor NGO in the Shell GMoU • Why has the communities not been including the natural assets e.g. forests in their projects planning? • Do you think that this situation can change or will change with time? • Can you provide me with a little background to this GMoU thing? 	<ul style="list-style-type: none"> • Yes • Most of these communities lack critical infrastructures. This is the reason why they are focusing so much on this aspect of their needs. They want to be seen to have upgraded in terms of infrastructures. Some of them also believe that they are going past the age when they have to rely on farming for survival but unfortunately, this should not be so because that is actually their source of survival. • I think it will change when they must have satisfied their infrastructural needs; the GMoU thing started in 2005 (with implementation in 2006) so the first cycle ended in 2011; we are now in the second cycle. So as you can see, it is just starting. I believe that forest and natural resources conservation may become key sometime in the future • In 2003, the management of SPDC in Nigeria began to explore a new approach in her community development activities. Prior to this time the SPDC Community development activities or intervention was limited to periods when they have any activities to carry out in the community or have major interest or activities to protect. The approach saw periodic and one-off activities in communities. Most of the projects carried out during the time were either finished and abandoned or not completed at all. Only few sections of the community participated in the activities. Also, factors such as sustainability and maintenance were never factored into the projects. The new initiative (GMoU) brings together

Place: Yenagoa	Participant: 55 (Anpez Centre for Environment and Development)
Question	Response
<ul style="list-style-type: none"> • Any gains? • What of on the part of SPDC? • How well has it done on 	<p>communities, clans or kingdoms and classifies them into Clusters and with focus on SPDC interests and activities; SPDC negotiates with the clusters and agrees to provide a minimum amount of money for the Cluster to carry out development projects and activities in the cluster. The amount agreed with the cluster and the process of managing the fund is thereafter captured in a document referred to as GMoU (Global Memorandum of Understanding). One thing that is peculiar about the GMoU is that SPDC now has a single common way and process of relating with her communities in whatever state or matter. The GMoU became operational in 2006 with Rivers and Bayelsa States leading the operation. SPDC has now signed over 40 GMoUs with about 25 being in operation. The initiative has seen SPDC disbursing Billions of Naira to various clusters since 2006.</p> <ul style="list-style-type: none"> • Several good things that have emerged from the GMoU is that communities were given the opportunity to implement programmes and projects that addresses their crucial needs. Every member of the community is given the opportunity to participate in the decision making for the community projects. Income activities in the communities has improved; most of the infrastructural activities in the communities are carried out by contractors from the clusters • On the part of SPDC, interruption to SPDC activities has reduced significantly, hostility against the personnel has also reduced, and the company is now viewed more as a partner than an oppressor or thief. The GMoU presents a very good prospect for the unprecedented development of Niger Delta communities as it encourages partnership. • Presently the concept is partnering with the various

Place: Yenagoa	Participant: 55 (Anpez Centre for Environment and Development)
Question	Response
partnerships? Any challenges?	state and local governments and is reaching out to other development stakeholders such as NDDC and donor agencies. • The major challenge to the initiative presently is the desire of the community members to use the money from the initiative to develop trophy infrastructures such as halls and palaces; little emphasis is paid to environmental management and resource recovery to expand the community economic base.

Appendix E : Published paper on sustainable management of the Niger Delta forests

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Towards the Sustainable Management of the Niger Delta Forests, Nigeria

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Abstract:

This paper considers the issues of forest resources utilization and conservation in the Niger Delta, Nigeria. It appraises the livelihoods of the people and effectiveness of forest management options that have been used in the region. It is based on a review of relevant literature and field interviews with 93 respondents in Bayelsa State, Niger Delta, Nigeria. All respondents (100%) agreed that the forests were important to the livelihoods of the people and 69% of the sample agreed that forest resources are threatened. Government policies have not been effective but community conservation initiatives were stated to be effective where they exist. It is suggested that government, being the policy formulator and implementer, should review and adopt a more result-oriented approach, which will achieve the aim of sustainable forest resources conservation; this could involve a review of strategies adopted to date (self-assessment), better equip and provide more funding to the forestry department, improve communication with the rural communities, carry out sensitizations and environmental education programmes, and provision of incentives or alternatives to the rural dwellers (agro-forestry schemes, agro-enterprises, trainings in alternative skills for income generation).

Key words: Forest management, Conservation, Niger Delta, Livelihoods

1. Introduction:

The Millennium Ecosystem Assessment Report, MA (2005) stated that “nearly two thirds of the services provided by nature to humankind are found to be in decline worldwide” and according to DEFRA (2007), “the benefits reaped from our engineering of the planet have been achieved by running down natural capital assets”.

The forests of the Niger Delta have supported the livelihoods of local communities for many generations. However, many factors, including unsustainable harvesting of forest resources, primarily for timber, and crude oil extraction, are reducing and degrading the Niger Delta forests. As a result, the forest ecosystems, and the services they provide, have been under increasing pressure, and this is threatening the forests’ ability to support local livelihoods (LENF 1998, NDES 1997).

When forests are logged, destroyed, or converted to other uses, local communities, and particular women, suffer from the loss of non-timber forest products (Isoun 2006). In the Niger Delta, local communities depend almost entirely on these raw materials, and the products derived from them, for everyday income and survival. Some of these raw materials include wood (for building, fuel, carving of various items including canoes, paddles, drums); rattan (cane rope) which is used in making furniture; wine which is tapped from the raphia and oil palm trees are sold either as fresh palm and raphia wines or are distilled into local gins; the palm fronds are used in making brooms; twines and lianas are used as ropes and making of sponges; wildlife (including snails) are sources of protein and also commercial commodities; various plant parts are extracted for

medicines; various fruits are collected for domestic consumption and for commercial purposes e.g. ogbono (*Irvingea gabonensis*). These materials and products are vital in local economies of Niger Delta communities.

In recognition of this, certain conservation and preservation measures have been implemented by the Nigerian government, including measures for setting aside forest reserves through the enactment of laws. But these efforts are not yielding the expected results, as illegal and unsustainable hunting and collection of forest resources are still resulting in forest and biodiversity loss and degradation (LENF 1998, Amoru 2000).

There appears to be a high preference for current consumption of forest resources, so that future benefit flows are highly discounted. The ability of forests to regenerate at a rate capable of meeting demand has been exceeded in many parts of the Niger Delta, with the result that many of the forest stocks producing those resources are in terminal decline. Associated with these issues is a range of other environmental problems such as erosion, infertile agricultural lands, and decline in forest and water resources.

This paper considers the issues of forest resources utilization and conservation in the Niger Delta, Nigeria, in particular, appraising the livelihoods of the people, and how they are dependent on forest resources, and the effectiveness of forest management options that are used in the region.

2. Method

The research in this paper proceeded in two main data collection phases.

In the first phase, a review of literature and policy was used to develop an analytical framework for identifying key challenges and providing possible solutions to the management of Niger Delta forest resources. A key feature of this framework was the application of the *Sustainable Livelihoods Framework* (DfID 1998, 2002) and the

Ecosystem Framework (MA, 2005). These were also used to identify how forest resources benefitted local communities.

In the second phase, field surveys were conducted in Bayelsa State, Nigeria, using both qualitative and quantitative social science methods to obtain data from forest community residents and local experts. Three key informant respondents from the Bayelsa State Forestry Department were interviewed regarding issues linked to forest policy and institutions. Then 50 respondents from two rural communities (Akpide-Biseni and Akipelai-Ogbia), and 40 respondents from an urban area (Yenagoa) were interviewed. The results from these interviews provided the main source of primary data.

While Akpide is in a freshwater swamp forest belt, Akipelai is a mangrove forest community. Yenagoa, although an urban centre, is in a freshwater swamp forest zone. All three communities have pockets of rainforest ecosystems.

Whilst a semi-structured interview method was felt to be more appropriate in the rural communities, a structured questionnaire was used in the urban centre. This provided a mix of qualitative and some quantitative data.

3. The Livelihood Framework:

The challenges facing resource poor people in rural areas are complex and multi-dimensional. Understanding such challenges therefore requires an integrated analysis. The sustainable livelihood framework (Figure 1) has emerged as a means of understanding how the lives of rural dwellers are vulnerable to shocks and drivers of change (Ezenwaka 2002).

The framework proposes that sustainable livelihoods are dependent on a number of livelihood assets, which include:

- vi. Natural assets e.g. naturally occurring assets like the forests

- vii. Physical assets e.g. infrastructure such as markets, road networks and social amenities
- viii. Human assets e.g. knowledge and skills
- ix. Financial assets e.g. income base of the people
- x. Social assets e.g. social networks or associations which people belong

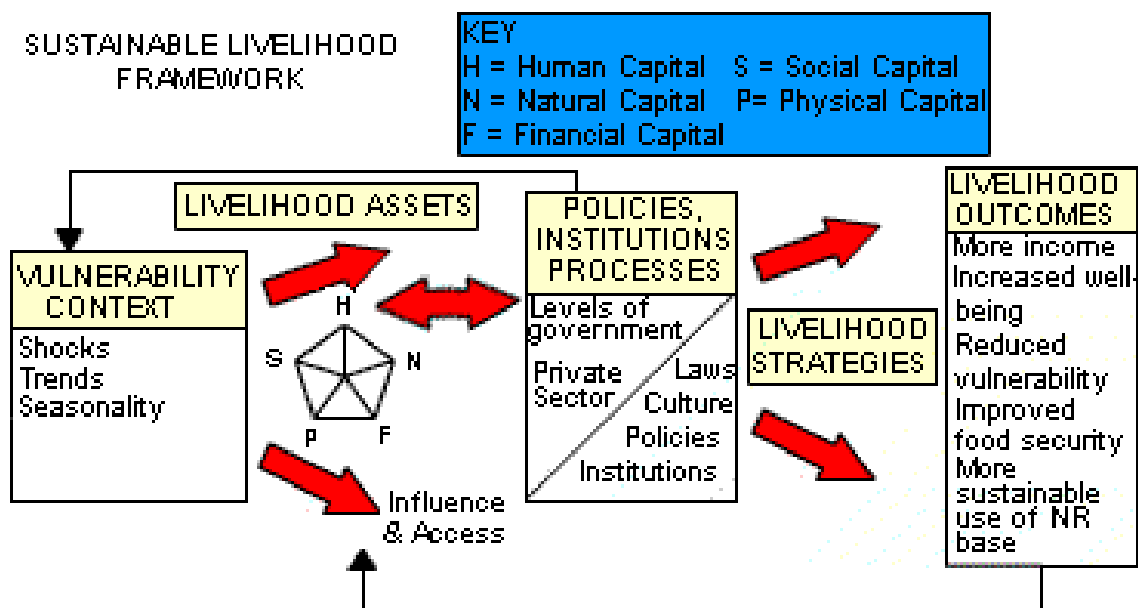


Figure 1: Livelihood Framework (DfID 1998, 2002)

All five assets are seen as crucial to an individual's livelihood and particularly in the long-term, effective access to these assets is important for that livelihood to remain sustainable. These assets are a form of *capital* to the people. Bourdieu (1986) described capital as, "an accumulated labour that can be appropriated by individuals or groups for their exclusive use to further their interests and increase their capital holdings or chances of survival". From this perspective, the sustainable management of forests as natural capital is an important component in securing the livelihoods of the people for the future, particularly as forests also support the provision of other forms of capitals. For example, the forest products are harvested and sold (producing money; financial capital); the money is used to create physical infrastructures such as markets and roads (physical capital); the various forest based associations such as farmers group, palm

tappers group, hunters group, are forms of social capitals; the various skills adapted as related to the extraction and use of the forest resources are forms of human capital. The entire life of the Niger Delta rural dweller revolves around the forest resources.

There are many factors that influence how individuals use natural capital (DfID 1998, 2002). These include:

- Natural events that make people vulnerable, such as shock events (e.g. storms, floods), trends (e.g. climate change), and seasons (e.g dry seasons characterized by lack of access to water).
- Presence of alternative sources of livelihood assets (e.g. whether and what other resource use options are available. In this aspect, government policies become very important, at least in the provision of alternatives for the people).
- Certain institutional and governance factors such as government policy, private sector policy, culture, institutions, and property rights.

These factors influence the livelihood strategies of rural people, shaping the options and survival strategies that are available to them. The success or otherwise of the livelihood strategy, affects the livelihood outcome. Successful interventions increases livelihood sustainability and wellbeing, building resilience to shocks, trends and seasonality, so that vulnerability is reduced.

The Niger Delta Environmental Survey, (NDES 1997) identified a number of threats to the sustainable provision of forest ecosystem services in the Niger Delta. These threats were categorized into three major groups as follows:

- Natural / Environmental: including coastal and riverbank erosion, flooding, subsidence, sedimentation, and siltation.
- Developmental / Human: including urbanization, land degradation, soil fertility loss, agricultural decline, loss of vegetation (especially non-timber forest products) and habitat for wildlife, biodiversity depletion especially fisheries decline, and pollution from industrial activities.

- Socio-economic: including poverty, unemployment, and communal conflict resulting in loss of lives and property, displacement of people, and loss of sources of livelihood.

Of key importance in reducing the resilience and sustainability of local community livelihoods in the Niger Delta is the degradation of the Niger Delta forests because these play a key role in rural livelihoods in the area. The consequences of this degradation have been:

- i. Biodiversity loss: biodiversity is being depleted rapidly by hunting, uncontrolled logging, poorly conceived construction / developmental projects (Photos 1 & 2), oil and gas exploitation and urbanization (LENF 1998). Furthermore, federal, state and local governments and their agencies have limited capacity and support to conserve biodiversity in designated protected areas and other priority sites for conservation. It is a source of great concern that some parts of the Nigerian tropical rainforest have been degraded to savannah-like vegetation (here referred to as man-made or derived savannah) and in some other places, to a dominant vegetation of palm bushes and trees (Photo 3) because most other trees of economic value have been harvested without being replaced (Ezenwaka 2010).
- ii. Declining fisheries resources: Depletion of fish stocks as a result of over-fishing and pollution is a major constraint facing water resource. Fishing is a critical activity for local communities of riverine Nigeria (Ezenwaka 2002, LENF 1998). Many rural dwellers in the riverine areas depend on fishing as a means of livelihood (Photo 4). Fish is a major source of income in the riverine communities (Allison-Oguru 2006).
- iii. Invasive species: Invasive species threaten local biodiversity, on which people depend. A good example is the Nypa palm (*Nypa fruticans*), an introduced exotic species). This is one of the biggest threats to biodiversity in the Niger Delta. Together with water hyacinth (*Eichornia* spp.) (Photo 5),

another invasive plant, *Nypa* palm blocks waterways, making fishing and transportation activities very difficult in rural communities (LENF 1998).



Photo 1: Bad road-engineering work and poor planning resulting in ponding of water on one side of the road. Water-flows have been interrupted by this roadwork, so that down-stream areas are starved of water while up-stream water has been impounded. With time, this situation will result in changes in the ecological composition of the up-stream and down-stream sides of this road. These changes could have effects on the livelihoods of local people. (Photo by Jasper Ezenwaka, 2014)



Photo 2: Plants dying as a result of the ponding of water caused by road engineering works. (Photo by Jasper Ezenwaka, 2014)



Photo 3: Palm bushes; all other trees of economic value have been extracted as timber
(Photo by Jasper Ezenwaka, 2014)



Photo 4: Fish is important as a source of protein and income in rural livelihoods of the Niger Delta (Photo by Jasper Ezenwaka, 2014)



Photo 5: Water hyacinth covering part of this river. This makes fishing and transportation difficult (Photo by Jasper Ezenwaka, 2014)

4. Appraisal of Various policies aimed at forests management

Policies are a major key in the livelihoods framework. The type of policies and their implementations have effects on livelihood strategies and outcomes of the forest dependent rural dwellers. It determines what survival options are available to the people. Policies have the power to either reduce the people's vulnerabilities (by mitigating against the shocks and trends) or further expose the people to it. Policy therefore has the power to either make them achieve their livelihood outcomes or not.

In the Nigerian Constitution (1999), legislative and administrative powers are divided amongst three tiers of government, that is, the federal, state and local governments. Under this arrangement, the Federal Government exercises exclusive legislative and administrative powers in matters listed in the *Exclusive Legislative List* (Nigerian Constitution, 1999). Included in the *Exclusive Legislative List* are matters related to

forest use and management. Under the constitution, the local government councils and the state governments are required to jointly participate in the development of agriculture and forests in their states. The implication of this is that the three tiers of government are, at least in theory, appropriately involved in the administration or management of forests in the country. They therefore are responsible for maintaining the administrative structures that are relevant to the attainment of goals set for the conservation and sustainable use of forests (Nigerian Constitution 1999; ND-HERO 2006).

Thus, forest administration is managed through federal and state agencies and departments, such as the Federal Ministry of Environment and state ministries responsible for agriculture, water resources, and the environment (Amoru 2000; ND-HERO 2006). The Federal Ministry of Environment is required to formulate and supervise the implementation of all national policies and programmes concerning the conservation of forests. The federal and state ministries of agriculture and environment are responsible for the establishment and maintenance of national and state forest reserves, zoological gardens, and wildlife parks, and for *in-situ* and *ex-situ* biodiversity, soil and other environmental conservation activities.

However, whilst theoretically, the administration of forests should be carried out mainly within the administrative structure provided by the various government ministries and agencies, in practice, most of these structures have not functioned effectively in implementing government conservation policies and programmes. This is largely due to bureaucratic bottlenecks, corruption, inadequate funding, under-staffing, lack of appropriate knowledge, and insufficient commitment to service on the part of public servants (Amoru 2000; ND-HERO 2006). A further and important defect of the administrative system is the exclusion of local government councils, local communities, and non-governmental organisations. This has led to the alienation of these institutions, preventing them from any involvement in the conservation and management of Nigeria's forests (Amoru 2000; ND-HERO 2006; Ezenwaka & Abere 2010).

In the pre-colonial period (before the early 19th century), communal life was primarily rural and the people lived their lives as fishermen, hunters, or craftsmen (Alagoa 2002). There were no direct policies regarding forests conservation, but local people had strong ties with their forestlands, and developed various traditional practices based on taboos, tenure systems, and customary rules that regulated the exploitation and use of forests (LENF 1998; ND-HERO 2006). Thus, embedded in these traditional lifestyles, rules, regulations and practices were underlying policy objectives that indirectly ensured a relatively sustainable exploitation and use of forests.

During the colonial era (early 19th century upwards), the nation's policies on forests conservation centred mainly on the setting aside of portions of community forest lands as reserved and protected forests under the control of colonial forests departments. This did not consider the interests of the community stakeholders (Amoru 2000). The aim of the colonial forest reservation policies was not to achieve sustainable management but to secure supplies of timber for colonial infrastructure and export (Amoru 2000; ND-HERO 2006). While restrictions were tightened in and around the few reserved and protected forests, denying local people any right of use, access, or ownership, the vast majority of unprotected forestlands were left open to uncontrolled exploitation.

After independence (1960), the country had no significant policy on management of forests until 1989 when the National Policy on the Environment was adopted (ND-HERO 2006). The policy recognised and advocated the need to balance development with sustainable production of the forest resources. It accordingly prescribed the adoption of strategies such as, the regulation of forest activities, the protection of biodiversity (which aimed particularly to protect endangered flora and fauna), establishment of more forest reserves, national parks, and game and wildlife reserves, in order to achieve conservation and sustainable use of forests.

Since adoption of national policy on environment, successive governments at both the federal and state levels have attempted to implement various regulatory and administrative measures, and programmes, that have, without tangible success, aimed to enhance conservation and sustainable use of forests in the country (Amoru 2000; ND-HERO 2006). Such measures included the introduction of a new policy on land use and management systems as well as the establishment of a number of national parks (e.g. Yankari National Park, Kainji Lake National Park, and Old Oyo National Park), annual nation-wide reforestation and tree planting campaigns, and the enactment of various laws against environmental pollution and trading in endangered species.

Some of these various efforts include:

(A) At the Federal Government Level

The federal government has made several policies in this regard but those relevant to natural resources conservation include:

- vi. *“The Natural Resources Conservation Act 1989”*
- vii. *“Federal Environmental Protection Agency Act (Chapter 131, Laws of the Federation, 1990)”*
- viii. *“The Environmental Impact Assessment Act (no 86 of 1992)”*
- ix. *“Endangered Species (Control of International Trade and Traffic) Act 11 of 1985”*
- x. *“The National Parks Decree (Decree No 36 of 1991)”*

(B) At the State Government Level:

The laws and policies that are set at the federal government level are domesticated at the state government level. By this, each of the 36 states (and the Federal Capital Territory, Abuja) that make up the Nigerian Federation have laws similar to that of the federal government to regulate natural resources issues at their respective states. For example, among the efforts of the Bayelsa state government in this regard, is the establishment of six forest reservation areas: the Taylor Creek forest reserve; the Edumanon forest reserve; the Nun River forest reserve; the Apoi Creek forest reserve; the Igbedi Creek

forest reserve; and the Ikibiri Creek forest reserve (Abere S.A & Ezenwaka Jasper 2011).

(C) At the Local Government Councils Level:

This tier of government is the closest to the rural dwellers and should have been more relevant in policy issues regarding conservation of forest resources. But unfortunately, they are not efficient (Amoru 2000; Axel Stremplat, Ezenwaka *et al* 2004; ND-HERO 2006)

(D) At the Community Level:

The community / rural dwellers are the main utilizers of the forest resources; their livelihoods depend greatly on the forests. It is interesting to note that, policies aimed at conserving forest resources exist also at the community level. Ezenwaka & Abere (2010) stated that the rural dwellers have strong attachment to their forestlands. As a result of this, they have developed ingenious forest use solutions, based on extensive local knowledge and ways of conserving forest resources. ND-HERO (2006) listed some example of these traditional / customary forest conservation practices as:

- vi. “the dedication of certain resources to deities which then insulates such resources from human exploitation”. Example of this were found in Akpide where crocodiles are deified. As a result of this practice in Akpide, this species stands protected to the extent that if it is killed, it must be buried with the same burial rights as for humans, in that community. Nwosu *et al* (2013) and Anwana *et al* (2010) also confirmed this belief system in the Niger Delta.
- vii. “the restriction of exploitation of forest resources to specific days of the week or seasons of the year”. This example was found in Akpide and Akipelai communities during the field survey. In Akpide, fishing can only be done every three years in the following lakes: Esiribi, Ayuu, Eremini, Puro, Mowei, Asemini and Kilapuro (although the youth have modified this rule to two years presently). In Akipelai community, felling of trees and farming are prohibited in the *eledum* forests while fishing in the *obatubo* creek is restricted to every four years.

- viii. “the adoption of agricultural practices like shifting cultivation”
- ix. “the adoption and strict enforcement of customary rules concerning land rights and exploitation of forest resources”
- x. “the adoption of licensing regimes (payment of a stipulated amount) for non-natives who wished to engage in the exploitation of forest resources in the community”. Both Akipelai and Akpide communities confirmed this licensing system. The amount is not fixed; it changes from time to time and depends on current situations.

5. Discussion on Effectiveness of the various policies:

Government policies:

The result from key informant interviews undertaken during this research shows that government policies on forest resources conservation have failed to produce the desired result. Among the various challenges identified during interviews with the Forestry Department were funding and bureaucratic bottlenecks. Officers at the Forestry department were however optimistic that the recent upgrade of some of the Bayelsa State’s forest reserves to the status of national parks could mean better funding and management (this upgrade of the forest reserves to the status of a national park was done in 2014). Amoru (2000) suggested that other reasons for failure could be because the interests of the rural dwellers were not considered when the forests were constituted into a reserve. The non involvement of the rural dwellers in the processes of setting up the forest reserve is enough reason to cause illegal tree felling and poaching within the forest reserves because the forests have always been their source of livelihoods. Ezenwaka & Abere (2010) suggested that an inclusive process of setting up the reserve could yield better results.

The essence of the policies was to conserve the forest resources. Table 1 shows the perception of rural and urban dwellers on abundance or otherwise of the forest resources. On average, 69% of the respondents thought that forest resources were threatened and another 26% (average) thought the forest resources are simply declining.

On average, only 5% responded that the forest resources are still in abundance. Interestingly, the 10% of respondents that thought that the forest resources were still in abundance were urban dwellers. All the rural dwellers either felt the resources were declining (30%) or were already threatened (70%). This may be because the rural dwellers are the closest to the forests and survive by using forest resources. Thus, the rural dwellers have local knowledge of how the resources used to be, as compared to the present day situation. During the interviews with the respondents in Akipelai community, it was stated and confirmed by all respondents in that community that some local staple food crops such as *amasi* have become extinct.

Table 1: Status of the Niger Delta Forest:

Respondents	Abundant (%)	Declined (%)	Threatened (%)
Rural dwellers	0	30	70
Urban dwellers	10	23	68
Average	5	26	69

Also during the interviews, knowledge of the existence of the various efforts being undertaken for forest conservation was tested. Respondents were asked if they were aware of efforts / actions of government or of community aimed at conserving the forest resources. Table 2 shows this result. Only 50% of urban respondents acknowledged government efforts to conserve forest resources whilst no rural respondents knew of any government efforts to manage the forests. It is particularly surprising that no community respondent (0%) from either Akpide or Akipelai knew that their community forests were part of a government forest reserve (Akpide is situated in the Taylor Creek forest reserve and Akipelai is in the Edumanon Forest reserve). One reason for this difference in awareness between the rural and urban respondents may be because of the greater access to information, through radio, television and print media, enjoyed by urban respondents, whereas community people have relatively poor access to the media and therefore to information. The rural communities did not appear to know any of the government extension officers who are supposed to disseminate information to the rural areas.

On the other hand, relatively few urban dwellers (25%) were aware of the role of community institutions and rules in managing the forests, whilst unsurprisingly, all the rural dwellers (100%) were able to identify and describe how community institutions and policies could be used to regulate forest use. The community people were able to mention names of lakes and forests that are conserved through community laws and also consequences of failing to keep the laws. A quarter (25%) of the urban respondents were not aware of any efforts either by the government or the communities in conserving forest resources.

Table 2: Awareness of effort(s) at conserving the forest resources:

Respondents	Government effort (%)	Community effort (%)	None (%)
Rural dwellers	0	100	-
Urban dwellers	50	25	25

It was important to find out what the respondents thought about the importance of the forest and if it was necessary to carry out conservation measures. Table 3 shows this result. All respondents (100%), from the rural and urban centers agreed that the forests were important and should be sustainably managed. All respondents also agreed to a partnership / collaborative forest management strategy that would assist in this regard.

Table 3: Is the forest important and should be sustainably managed?

Respondents	Yes (%)	No (%)
Rural dwellers	100	0
Urban dwellers	100	0
Average	100	0

Traditional conservation institutions:

While government conservation initiatives have failed to achieve the intended results, community initiatives have been successful where they exist. Forest resources in traditionally preserved areas, such as sanctuaries, are protected. These sanctuaries are

also known as “evil forests” or “sacred forests” (Amoru 2000; LENF 1998; Nwosu *et al* 2013; Anwana *et al* 2010).

Akpide and Akipelai communities have well defined and respected community laws that protect certain environmental resources. For example, fishing is regulated in the Akpide lakes and timber harvesting is prohibited in some (*eledum*) forests in Akipelai. Fishing is regulated in the *Obatubo* creek in Akipelai. Crocodile is deified in Akpide. These community strategies have been successful in preserving the intended resources (LENF 1998).

The interviews with rural dwellers showed that local communities respected traditional laws and obeyed traditional rule, which governed the harvesting of forest and wildlife resources. In many respect, these were part of local custom. Community laws in this research were widely known and understood by community respondents; 100% of rural respondents and even 25% of urban respondents attested to knowing of the existence of such laws (Table 2).

Conservation organisations in many parts of the world have recognized that traditional community rules and practices can be highly effective (ND-HERO 2006). Although the community rules are location-specific, they have been found to be effective where they exist.

6. Conclusion

It is evident from the result of this research that a large number of both rural and urban respondents felt that forest resources were declining and in some cases, already threatened. However, the results also show that all the urban and rural respondents wanted forests and forest resources to be properly managed and conserved.

This work also suggested that community (native) laws have been more effective in conserving forest resources than government laws. A limitation however was that such

community laws could not be applied outside the communities where they were made. They therefore had little effect in conserving forest resources across a larger geographic area. The effectiveness in conserving forest resources could be enhanced if neighboring communities are to make similar laws.

The potential strength of a government law is in its applicability over larger geographic regions. Government laws could become effective if issues of funding, corruption, and bureaucratic bottlenecks were treated. Rural communities will need to be involved in this process, and their participation is needed to ensure success of the conservation measures.

7. Recommendation

It is recommended that government should carry out a self-appraisal of its policies and that of the rural communities with a view to making the policies more effective. This process could: better equip and provide more funding to the forestry department; improve communication with the rural communities; carry out sensitizations and environmental education programmes; provide incentives or alternatives to the rural dwellers e.g. agro-forestry schemes, agro-enterprises and trainings in alternative skills for income generation.

Government should also take into account traditional knowledge; traditional / cultural practices compatible with conservation and sustainable forest resource use should be adopted and improved upon.

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Appendix F : Published paper on Niger Delta forest ecosystem services

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ECOSYSTEM SERVICES OF THE NIGER DELTA FORESTS, NIGERIA

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ABSTRACT

This research aimed to appraise the Niger Delta forest ecosystem services. The Millennium Ecosystem Assessment framework was used to categorize the potential benefits from the Niger Delta forests. Data was collected from 90 respondents drawn from selected rural and urban communities. While the urban respondents were aware of all the range of services provided by the forest, the rural respondents had zero knowledge of many of the services. Despite the good knowledge of ecosystem services by the urban respondents, only 42.5% were aware of fresh water provisioning services and only 27.5% were aware of water purification services. Both the urban and rural respondents had preference for the “provisioning services”. Rural populations were particularly dependent on consumptive and extractive benefits for livelihoods and wellbeing. The results highlighted the dependency of local people on provisioning services for basic livelihood requirements and the asymmetric distribution of education and information regarding forest benefits between urban and rural populations. The

need for environmental awareness creation and improved access to information of the unseen and un-valued benefits of the Niger Delta forest ecosystem is emphasized.

Key words: Livelihoods, forest, ecosystem, services, Niger-Delta

INTRODUCTION

The Millennium Ecosystem (MA) Assessment (Assessment, 2005) described an ecosystem as “a dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit”. The benefits that people derive from their ecosystems are collectively referred to as *ecosystem services* (Assessment, 2005; DEFRA, 2007; Graves *et al.*, 2009). The importance of the ecosystem services (ES) concept is in how it shows the diversity of flows of benefits from the natural environment and as well provides a means for valuation and recognition of both “value in use and non-use” (Graves *et al.*, 2009). Since the Millennium Ecosystem Assessment (MA) framework highlighted the critical dependency of humankind on the environment, and the degradation that puts that dependency at risk, the ecosystem services concept has been used as a means of identifying, categorizing, and valuing the benefits that ecosystems provide, and the concept is now firmly established as an analytical tool in policy agenda (Gómez-Baggethun *et al.*, 2010; Fisher *et al.*, 2009).

Ecosystem services are very important to the wellbeing and survival of people. Society depends on the continuous provision of ecosystem services for wellbeing and especially in poor countries where ecosystem services are fundamental in many people’s livelihoods. These services according to the MA (Assessment, 2005), include:

Provisioning services such as food, fresh water, wood, fuel and fiber;

Regulating services that affect climate, flood, disease, and water purification;

Cultural services that provide recreational, educational, aesthetic, and spiritual benefits;

Supporting services such as soil formation, photosynthesis (primary production) and nutrient cycling.

The recognition and valuation for each of the above ecosystem services vary greatly depending on whether the impact is direct or indirect. Those services that have a direct impact on livelihoods (such as food, fiber, fuel wood, some cultural services and recreation) are more easily recognized and valued. Other services provided by the ecosystem (such as regulation of the climate, the purification of air and water, flood prevention, soil formation and nutrient cycling) are less recognized and valued, and therefore take the form of “non-market, public goods whose values are difficult to directly ascertain” (DEFRA, 2007; Graves *et al.*, 2009) and this also provides the reason why they are frequently omitted within decision-making and policy appraisals (Isoun, 2006; DEFRA, 2007; Graves *et al.*, 2009).

Forests are often referred to as natural capital and are considered as a stock of capital or assets of given quantities and qualities (Graves *et al.*, 2009). They are also identified as one of the livelihood assets (capitals) in the *Sustainable Livelihood Framework* (Carney, 1998; DfID, 1999). Natural capital supports a number of interrelated ecosystem functions such as “production, regulating, habitat, carrier, and information, to provide capacity to produce a variety of ecosystem goods and services that have value for humans” (De Groot *et al.*, 2002).

Nigeria is endowed with abundant natural resources, both renewable and non-renewable. The oil and gas which accounts for about 95% of Nigeria’s export earnings and about 80% of the total annual income (Darah, 2001) has over the years become a cause of many conflicts in the Niger Delta region of Nigeria. Apart from crude oil, the region is also rich in forest resources that are important in the livelihoods of local people. Whilst the forests are of little financial worth (to the government) relative to the export earnings of oil and gas, they are of significant importance to the livelihoods of local stakeholders

and have a range of beneficial market and non-market impacts, providing a source of income, fuel wood, medicine, food, leaves, and raw materials (Obot, 2006; Allison-Oguru, 2006).

The Niger Delta is made up of wetlands, which are considered amongst the most bio-diverse on earth (Obot, 2006) and within these wetlands, distinct vegetation types (the mangroves, freshwater swamp forests and lowland rain forests) are found.

The many islands, rivers, creeks, and other water bodies that are found in the Niger Delta impressed the early Europeans who took several centuries to discover the great natural beauty and economic potential of the area (Allison-Oguru, 2006). As a result of this, Kingsley (1897) stated *“the great swamp region of the Bight of Biafra is the greatest in the world and that in its immensity and gloom it has grandeur equal to that of the Himalayas”*. Leonard (1906) also said *“the country (the Niger Delta area) may be described as one in which Nature is at her worst. From the slime and ooze of the soil up to the devitalizing heat and humidity of the atmosphere, it leaves its mark on the people as an enervating and demoralizing influence.”*

Over 80% of the Niger Delta region is seasonally flooded during the wet season. As the dry season progresses, floodwaters recede, leaving permanent swamps and pools. The Niger Delta experiences strong tidal influences with seawater flowing as far inland as to the freshwater floodplains of the River Nun. These tidal flows create varied ecological niches that support complex and diverse life forms (Obot, 2006; LENF, 1998; SPDC, 2015).

The Niger Delta contains ecosystems that are locally and globally of ecologic and economic importance. Singh *et al* (1995) stated that *“the full significance of the Niger Delta's biodiversity still remains unknown because new ecological zones and species continue to be discovered and major groups, such as higher plants and birds, remain unstudied in large areas”*. Powell (1995) considered the Niger Delta a *“biological*

hotspot” with many locally and globally endangered species. Obot (2006) also described the diverseness and eco-importance of the Niger Delta ecosystem.

These highly varied and complex ecosystems offer a variety of important ecological services to local stakeholders. For example, they are a source of wood, meat, raw materials, fruits and medicines (LENF, 1998; Alagoa, 1999; SPDC, 2015; Obot, 2006). The traditional uses of the forests and waterways of the Niger Delta have supplied virtually all the needs of its people (Isoun, 2006).

A wide range of timber and non-timber-forest-products including aquatic resources are collected for food, medicines and utensils. The extent of use and the value of these resources are not valued in economic assessments and in planning for government and other interventions such as conservation actions (Isoun, 2006). The government’s conservation plans usually restricts access to these resources and thus have real potential for increasing poverty and conflict (Amoru, 2000; Isoun, 2006).

Water is another vital resource to the Niger Delta people. There are very few activities in the Niger Delta that are not directly or indirectly linked to water. Water in the Niger Delta is far more than a simple element of nature. According to Anderson and Peak (2002), in the Niger Delta “water is synonymous with life itself, with spiritual sustenance, with wealth and prosperity, and especially with communication and identity”.

Box 1: Some Benefits derived from the Niger Delta Ecosystem

- Wildlife (duikers, civets, monkeys, cane rats (grass-cutters), porcupines, pangolins *Manis* sp., giant rats *Cricetomys* sp., squirrels, bush pigs, monitor lizards *Varanus niloticus*, otters, water chevrotains); snails, giant snails *Achatina* sp., swamp and lake/pond fish, oysters crabs and periwinkles.
- Medicines: Animal parts and skins for traditional medicine and trophies
- Many fruits, leaves, roots, barks and nuts for medicine, food, and spices (e.g. “ogbono” or bushmangos *Irvingia* sp., “afang” leaves *Gnetum* sp., charcoal from *Rhizophora*, and kola nuts *Cola* sp.)
- Plant parts and extracts for cosmetics, dyes
- Rattan for canes, ropes, fish drying racks
- Honey
- Wine from *Raphia* palms
- Plant and animal parts for traditional cultural uses or arts/crafts.
- Shells and saplings for road and path surfacing
- Leaves for wrapping foods for preservation and steaming
- Saplings/vines for construction, fishing equipment and utensils, etc.

Ezenwaka *et al* (2004), Obute (2005) and Ogbe *et al* (2009) researched the medicinal benefits derived from the ecosystem by the Niger Delta people, and concluded that people derive many benefits from medicinal plants. Some were found to earn their livelihood from the sale of medicinal plants and the medicinal plant products. Traditional medicine men earn their living from the sales of these plants and a sizable percentage of the population depended on traditional medicines for their health needs, and for treatment or prevention of diseases (Gesler, 1984; Dauskardt, 1990) following traditions that go back centuries. Akerele *et al* (1991) confirmed the benefits derived from medicinal plants and called on the UN and its agencies to take action for the conservation of medicinal plants.

In view of the foregoing, this research aimed to identify how aware the Niger Delta people were of the various ecosystem services provided by the Niger Delta forests and to assess how important these services were to them. This study has become important because of the disproportionate emphasis placed on crude oil production in the region

(to the detriment of other resources) and the resultant unrest and conflict that has characterized the region since the 1990's to the present date.

METHODOLOGY

Niger Delta region and case study sites

The field study was carried out between October 2013 and May 2014 in Bayelsa State, Niger Delta, Nigeria. Respondents were drawn from two rural communities (Akpide-Biseni and Akipelai-Ogbia), and one urban centre (Yenagoa). The rural communities were chosen bearing in mind (i) the major forest covers in the Niger Delta, (ii) accessibility, (iii) major livelihood activities of the people (i.e. forest dependent), (iv) absence of inter / intra communal conflicts, and (v) population size (less than 3,000 inhabitants). Akpide-Biseni is in a freshwater swamp forest zone while Akipelai-Ogbia is in a mangrove forest zone; both rural communities have pockets of rainforests. Yenagoa, although an urban centre, is also located within freshwater swamp and rainforest ecosystems. Two of the three study communities are hosts to a government forest reserve (Akpide is in the Taylor Creek forest reserve and Akipelai is in the Edumanom forest reserve).

It is worthy to mention that politically, the Niger Delta is comprised of nine states, out of the 36 States and a Federal Capital Territory (FCT) that make up the Federal Republic of Nigeria (NDDC, 2000). The nine States of the Niger Delta (Figure 1) are crude oil producing; they include Ondo, Edo, Delta, Bayelsa, Rivers, Imo, Abia, Akwa-Ibom and Cross River.

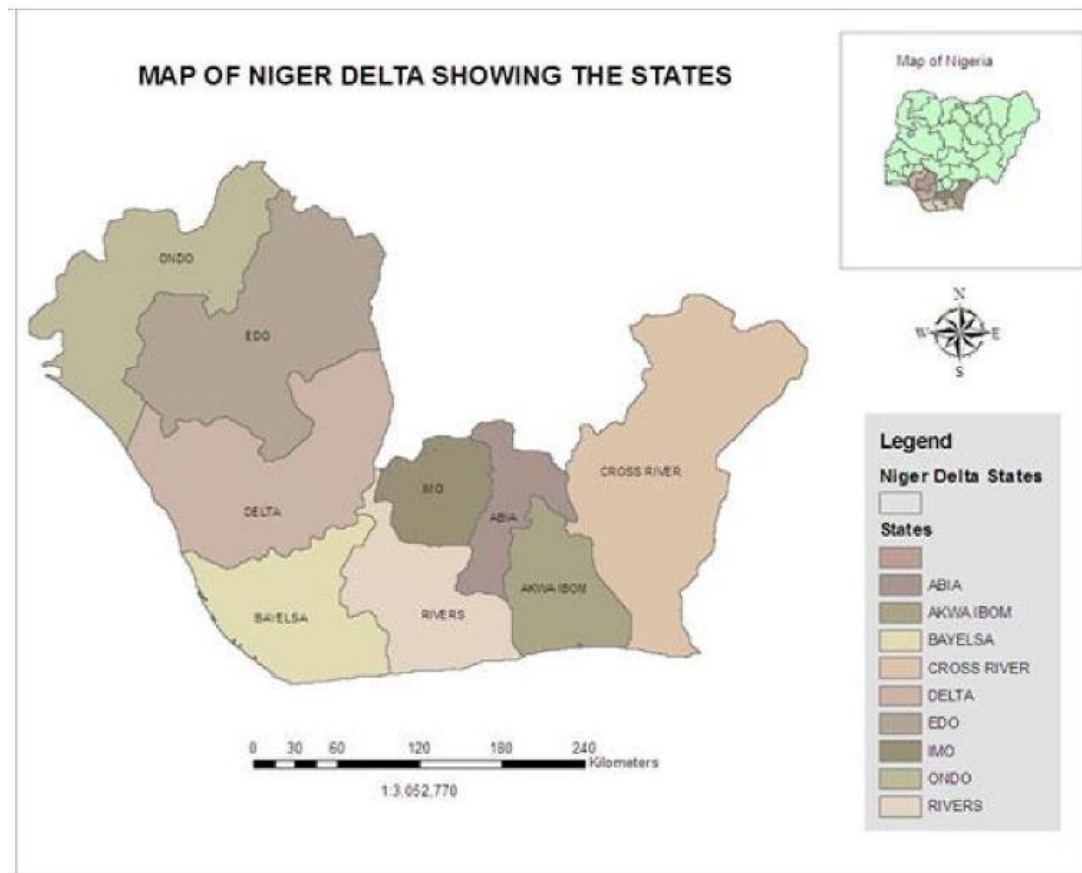


Figure 1: Niger Delta as defined by the NDDC Act (Nwankwo and Ogagarue, 2012)

The NDDC's definition has included the entire oil mineral producing States rather than the States, which are within the catchment of the Delta of the Niger River. In geographic terms, Anderson & Peek (2002) stated "the delta of the Niger River extends about 450km eastwards from Benin River estuary on the West and terminates at the mouth of the Imo River in the East". By this definition, the geographic (true) Niger Delta (Figure 2) is confined to only three States - Delta, Bayelsa and Rivers States. This area is estimated to be about 70,000km² "consisting of barrier islands, estuaries, mangroves, creeks and freshwater swamps" (Obot, 2006).

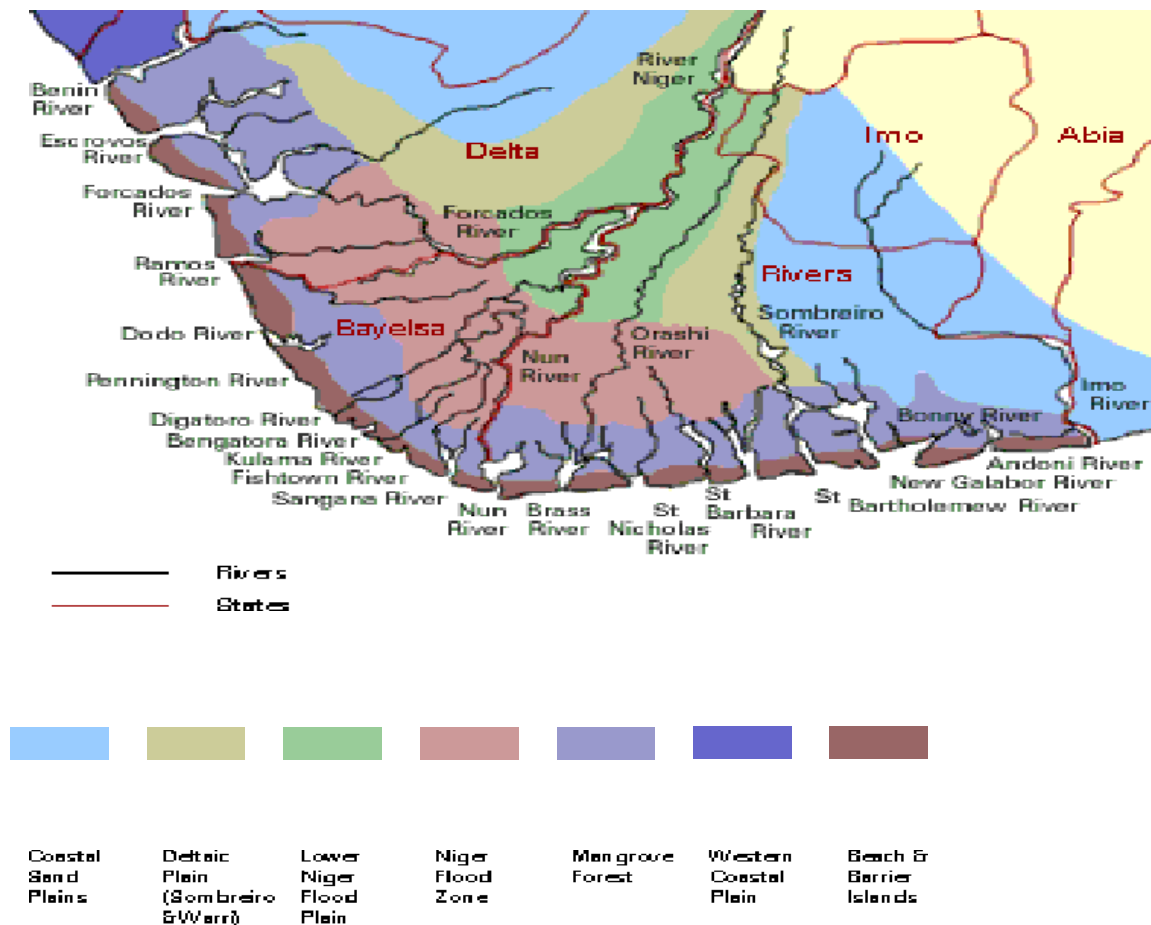


Figure 2: Geographic Niger-Delta (Ezenwaka, 2002)

According to the 1991 Nigerian census, the political Niger Delta is home to 20,386,303 people (NPC, 1991). In other words, almost 20% of the entire Nigerian population lives in the Niger Delta. The inhabitants of the Niger Delta are mostly fishers and farmers (Allison-Oguru, 2006). They engage in fishing in the creeks and rivers, as well as in the open seas. Non-Timber Forest Products (NTFPs), such as lianas, rattans, snails, leaves, roots, fuel wood, wildlife, fiber, fruit, gum, and honey, are a source of income to the people (LENF, 1998). The livelihood of the people is intricately tied to their immediate environment (Ezenwaka and Abere, 2009).

Development and use of ecosystem services questionnaire

The MA's ecosystem services framework (Figure 3) was adapted for use for the collection of field data. The questionnaire was used to collect category data on respondent's awareness of forest ecosystem services from both urban and rural respondents. Whilst in the urban areas, the questionnaire was self-administered, in the rural areas, the questionnaire was used as an interview schedule to guide discussion during the interview, as many could not read or write. The category data were collected directly on the questionnaire form whilst the narrative data were collected using written notes and a voice recorder, where possible.

Seventy-five questionnaires were randomly distributed within the Yenagoa metropolis. From this number, 52 were retrieved but only 40 were properly completed and usable. In each of the two rural communities, 25 persons were interviewed representing various community stakeholder groups e.g. council of chiefs, community development committees, farmers, fishermen, traders, hunters, artisans, women, youth, etc. In total therefore, there were 90 respondents. In the rural communities, a local facilitator was engaged to help interpret the questions into the native language. This was in addition to the researcher having to use the Pidgin English language (generally spoken within the region) to explain each of the services to the respondents. The entire concept was translated into locally relevant ideas that the rural dwellers could identify with. In order to improve accuracy, the same question was asked in different styles. Each interview lasted between 30-50 minutes.

The questionnaires were retrieved from the urban respondents and the results collated. In the rural areas, the response of the interviewees was noted against each question as the semi-structured interviews proceeded. The results were also then collated.

Data analysis and presentation

The data from the survey were collated in an Excel spreadsheet and were analysed to obtain basic statistical information that are presented in histograms. This was done because the main aim was to identify how many and to what extent, respondents were aware of forest ecosystem services in the Niger Delta Nigeria.

The narrative data were written down in a summary transcript and then coded using thematic content analysis (Corbin and Strauss, 2008; Taylor-Powell and Renner, 2003) to develop understanding of how urban and rural dwellers felt they benefitted from the forest.

RESULTS AND DISCUSSION

Awareness of ecosystem services

The general result shows that the urban dwellers are more aware of the various

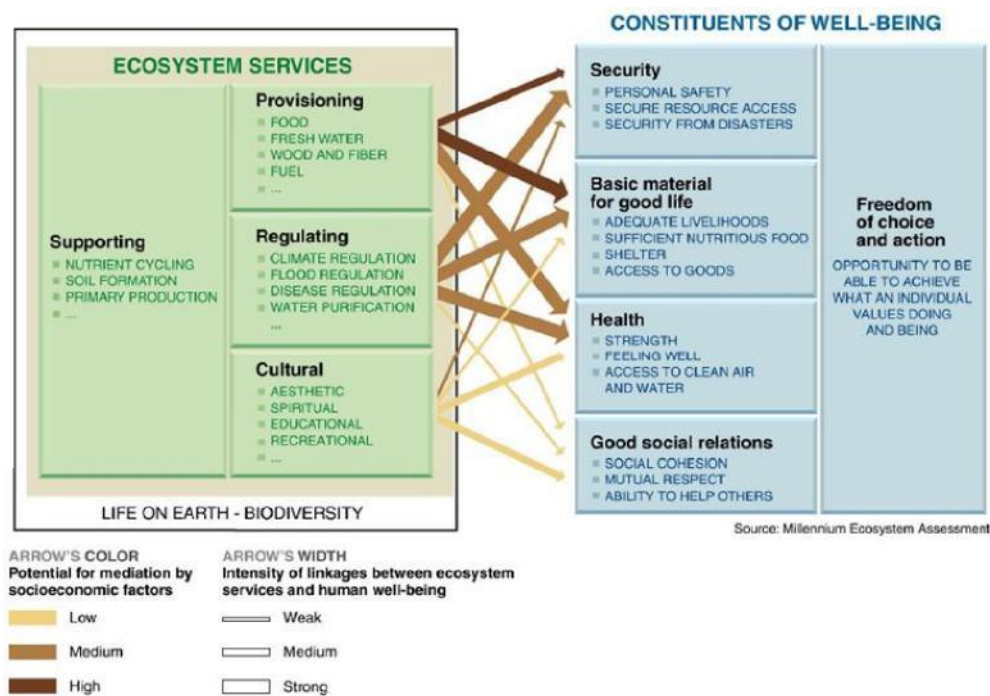


Figure 3: Ecosystem Services Framework (Assessment, 2005)

ecosystem services than the rural dwellers (Figure 4). While the urban dwellers have fairly good knowledge of all the services (though very few of them, 42.5%, had knowledge of fresh water provisioning and another 27.5% have knowledge of water purification services), the rural dwellers have no knowledge of fresh water and fibre provisioning, aesthetics and educational value, no knowledge of any regulating services and are not aware of primary production function (Figure 5).

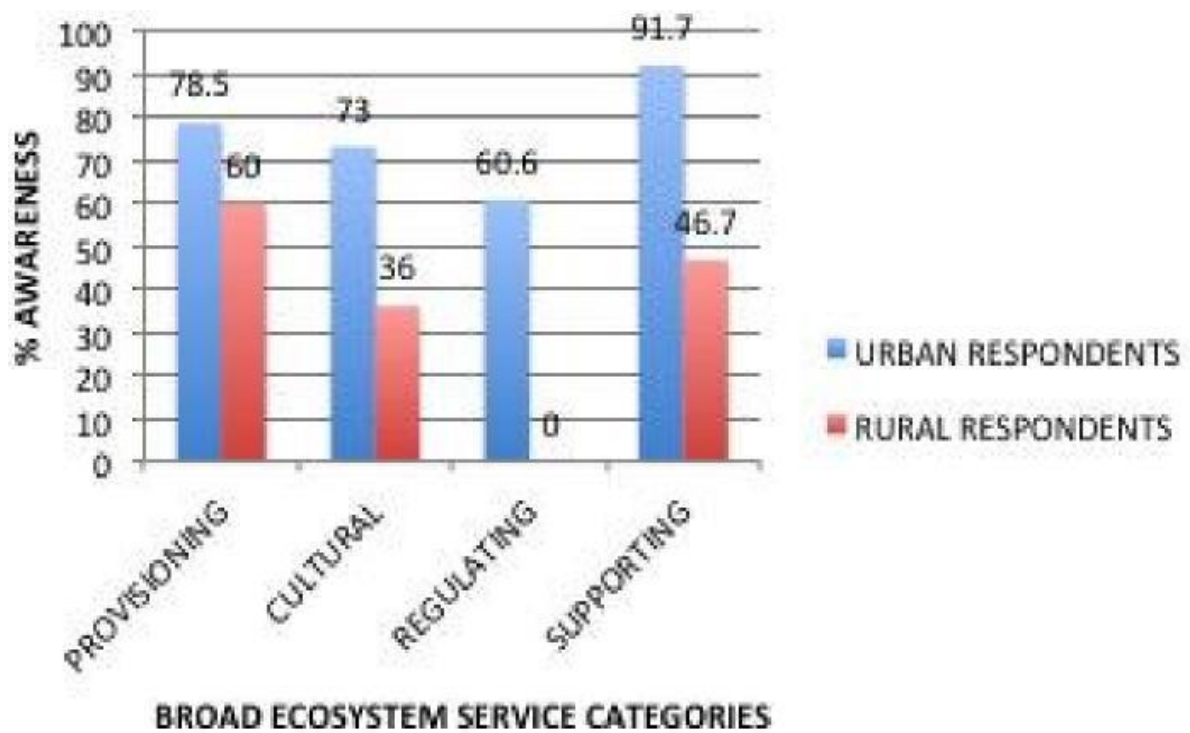


Figure 4: General Knowledge of ES by Urban and Rural Respondents

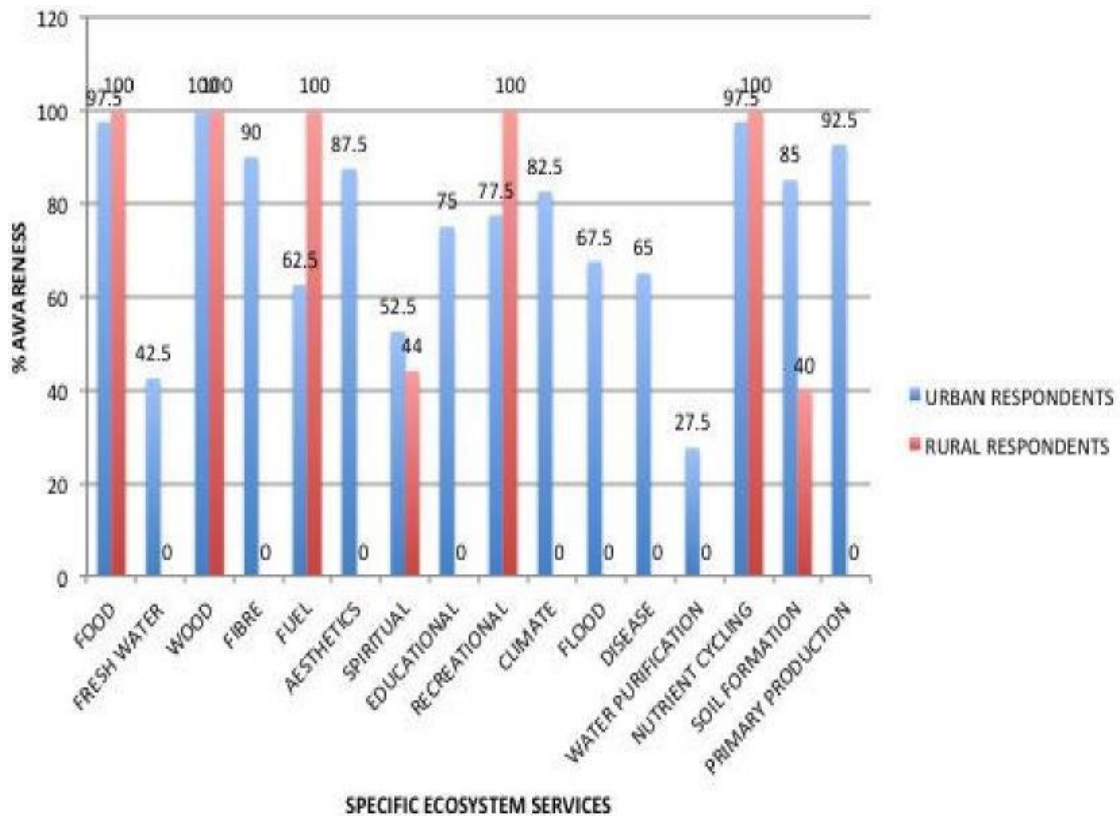


Figure 5: Knowledge of specific forest ES by urban and rural respondents

While it is encouraging that more than 50% of the urban respondents are aware of most of the ecosystem services, less than half of them are aware of services such as water provisioning and purification. Also, the rural respondents are only mostly aware of those benefits that relate to their daily livelihoods (as they lack knowledge of fresh water provisioning, fibre, aesthetics value, educational, climate regulation, flood, disease, water purification and primary production). These unknown services are vital to the wellbeing of these rural dwellers as much as the well-known services.

Awareness by the urban respondents

From Figure 4 and Figure 5, it is encouraging to see that the urban respondents are aware of all the ecosystem services as listed in the MA's framework (Assessment, 2005) although the percentage of those that are aware of specific ecosystem services differ. While all of the urban respondents (100%) are aware that the forest provides "wood", it

was 97.5% of them that knows of “food” and “nutrient cycling” services. 92.5% of the urban dwellers are aware of the “primary production” function of the ecosystem while 90% are aware of “fiber” provisioning. 87.5% of them agrees to the “Aesthetics” value of the ecosystem while only 85% appreciates the “soil formation” function. While 82.5% of them knows of the “climate” regulation function of the forest ecosystem, the percentage awareness drops to 77.5% for “Recreational” service, 75% awareness for “Educational” function, 67.5% for “Flood” regulation, 65% for “Disease” regulation, 62.5% for “Fuel” provisioning and 2.5% awareness for “Spiritual” services. The percentage awareness for “Freshwater” provisioning and “Water purification” services were the lowest where the awareness were just 42.5% and 27.5% respectively for the urban respondents.

This tells that the urban residents think of “wood” essentially when the word “forest” is mentioned. The exceptionally low awareness for “freshwater” provisioning and “water purification” service is worrisome.

When the average of the awareness scores is calculated under each broad ecosystem category, we see the highest average score of 91.7% for “Supporting” services, followed by 78.5% for “Provisioning”, 73% for “Cultural” and 60.6% for “Regulating” services. The exceptionally low score for “Freshwater” under the “provisioning services” has contributed to why the “Supporting services” had the highest average score; for instance, if the highest three scores are considered for the “Provisioning services”, the average score for this category would have been 95.8%.

Awareness by the rural respondents

It is a sharp contrast when compared with that from the urban dwellers. Figure 4 and Figure 5 shows that the rural dwellers are only aware of such ecosystem services as relate directly with their livelihood provisions. A 100% of them are aware of “food, wood and fuel” provisioning as well as “recreational and nutrient cycling” services. Only 44% of them are aware of “spiritual” services and just 40% are aware of “soil

formation” services. Beyond the above listed ecosystem services, no other ecosystem service is known to the rural dwellers. Although these other unknown (freshwater, fiber, aesthetics, educational, climate, flood, disease, water purification and primary production) services affect their lives as well on a daily basis, they seem not to be conscious of it. They simply are not aware of it.

The average scores for the broad ecosystem categories sees the “provisioning services” having the highest average awareness score of 60%. This score is this low because of the zero scores for “freshwater and fiber” provisioning services. The second highest average score is for the “supporting services” with an average awareness score of 46.7%. These people are farmers and are aware of the nutrient cycling function of the forests as they practice shifting cultivation as a system of farming. The third is “cultural services” with an average awareness score of 36%. The worst is “regulating services” where there was no score at all.

The low awareness by the rural dwellers of many ecosystem services is a thing of concern because these are the closest people to the forests and their daily activities impacts on the ecosystem service flows.

Preference for ecosystem services

With regards to general preference for the forest ecosystem services (Figure 6), 57.5% of the urban respondents preferred the provisioning services of the forest ecosystem while another 37.5% preferred the regulating services. The remaining 5% preferred the cultural services. No urban respondent wanted the supporting services. The rural respondents showed a big contrast with 100% of them preferring the provisioning services. On specific preferences for these services (Figure 7), 37.5% of the urban respondents preferred the food provisioning and climate regulating functions of the forest ecosystem while 96% of the rural respondents showed preference for food provisioning services.

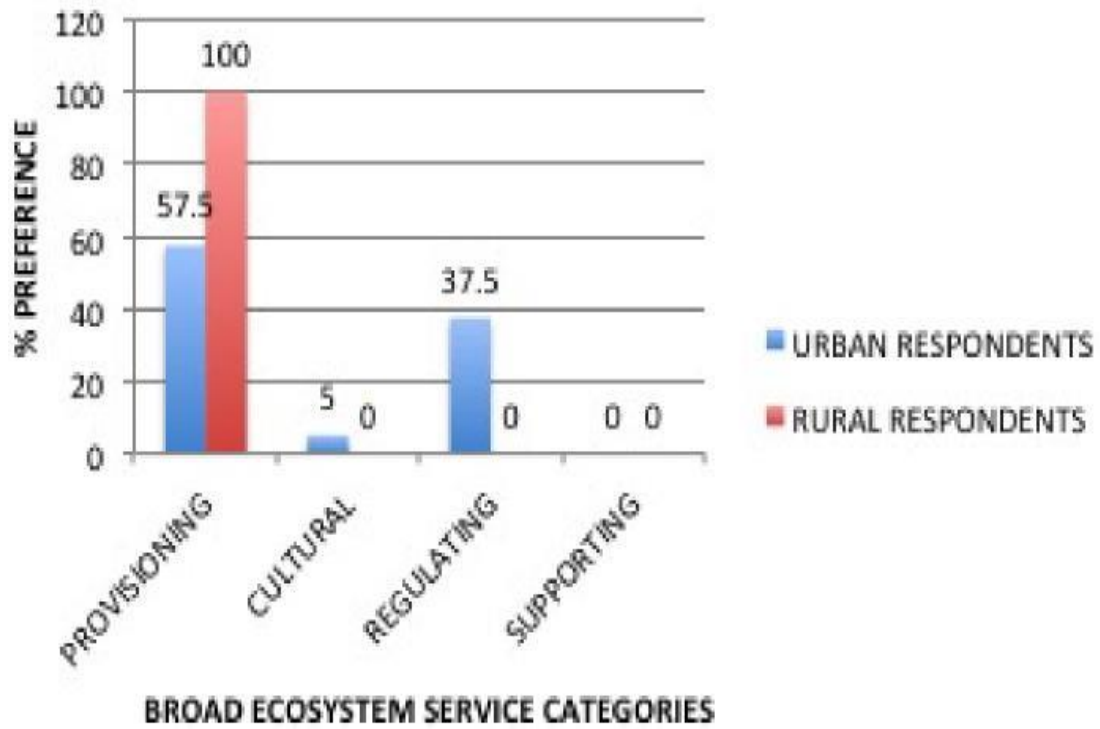


Figure 6: General preference for ES by urban and rural respondents

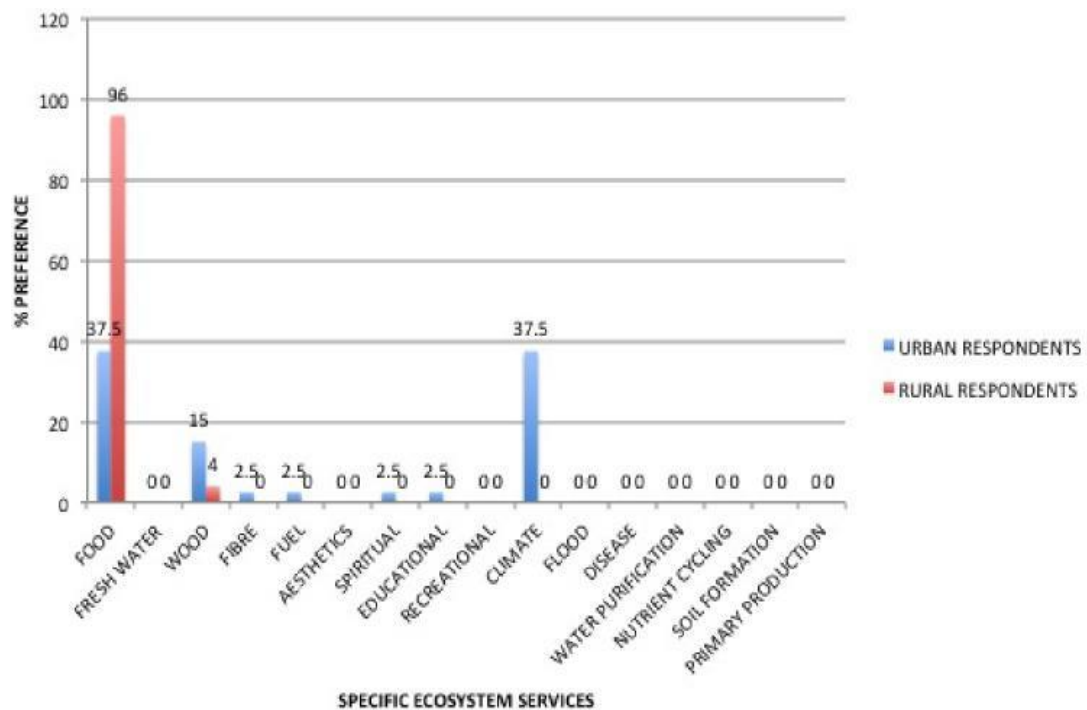


Figure 7: Preference for specific ES by urban and rural respondents

The “provisioning” ecosystem service was the most important ecosystem service to rural people. An equal number of urban respondents (37.5%) showed preference for food provisioning and climate regulating functions of the ecosystem.

Most important forest ecosystem service

The urban respondents felt that “food provision” (37.5%) and “climate regulation” (37.5%) were of greatest importance as forest ecosystem services and both were given equal importance (Figure 6 and Figure 7). The reasons for this were because the urban people knows that most food products are from the forest areas and are also equally aware of various environmental campaigns aimed at curtailing global warming and climate change. However, when the percentage scores of the specific services are added together under each broad ecosystem service categories, we have 57.5% of the urban respondents preferring the “provisioning” services. The score of 37.5% for the “regulating” services from the urban respondents shows their level of awareness to the importance of the forest in this regard. The score of a total of 5% for “cultural” services tells that a few urban residents still appreciate this service compared to a score of 0% for “supporting” services.

The above is a huge contrast to that of the rural respondents. The rural dwellers placed more value on “food” as 96% of them preferred “food” while the remaining 4% preferred “wood”. It is worth mentioning that the 4% that preferred “wood” are actually loggers; logging is their source of livelihood and therefore the most important service from the ecosystem to them, is “wood”. When the scores are added together, 100% of the rural dwellers chose “provisioning” services of the forest ecosystem above all other services. This is in line with the MA’s (Assessment, 2005) statement that the ecosystem services are very important to the livelihoods of especially, the poor. They have no other alternatives; to them, the ecosystem services, is life. The result of the interviews also shows a 100% of them depending on environmental resources for sustenance. They do not have any other source to earn a living.

The usability of the MA's ecosystem framework

The MA's ecosystem framework (Assessment, 2005) was useful during this field work. It covered most of the services people could identify with. There were other services provided by the Niger Delta environment that this framework did not classify. Transportation was found to be an important service for the riverine Niger Delta communities. Many of the communities in the Niger Delta cannot be accessed by road. They rely on the water networks for transportation of both humans and goods. It is these same river networks that take them to their farmlands and it is a sign of wellbeing to own a canoe in these communities. Other versions of the ecosystem framework (De Groot, 2006) listed transportation under "carrier" functions of the ecosystem. Fishing and table salt production are among other uses to which the water resource of the Niger Delta is put (LENF, 1998; Isoun, 2006).

Other very important provisions from the Niger Delta forests, which were not listed in the MA's framework, are medicines and raw materials; the rural respondents mentioned these as part of benefits from their forests. LENF (1998), Alagoa (1999), SPDC (2015), and Obot (2006) confirms the importance of the Niger Delta forests in providing medicines and raw materials for the people. DEFRA (2007) listed medicine under the "provisioning" services while De Groot (2006) listed medicine and raw materials under the "production" functions. De Groot (2006) listed mining, waste disposal and cultivation under the "carrier" functions. It was observed that these are true for the rural dwellers of the Niger Delta; sand mining and domestic waste disposals were observed at their streams.

Figures 8 and 9 shows the waters as a means of transportation and movement of goods in the Niger Delta.



Figure 8: Fiber boat, powered by an outboard engine is a means of commercial transportation in the Niger Delta. They are faster than the locally dug out wooden canoes.



Figure 9: Wooden canoe; a valuable transport asset to local people. It is more affordable than the fibre boat. It is a sign of wellbeing to own one in these communities

Figures 10 and 11 shows the forest as a source of raw materials. Rattan is a useful raw material harvested freely from the Akpide forest. It is used in making items including fishing gears and furniture. The man in Figure 10 earns his living from the harvesting and use of rattan.



Figure 10: Fishing gears (Non-return valve trap) made from Rattan



Figure 11: Production of furniture items from Rattan



Figure 12: Fuel wood for domestic cooking; Rural people do not have easy access to other means of domestic fuel for cooking; they rely on firewood, which are freely available in their forests.



Figure 13: Sand mining from perennial streams; a means of livelihood for some rural dwellers. It is their source of sand for building and other works. (Photos by Jasper Ezenwaka, 2014)

The forest is considered by the rural dwellers as a source of income and employment. The MA (Assessment, 2005) stated that the ecosystem services are vital to the livelihoods of especially, the poor. In Nigeria, the extent of use and the value of these resources are not valued in economic assessments and in planning for government and other interventions such as conservation actions (Isoun, 2006). The government's conservation plans usually restrict access to these resources and thus have real potential for increasing poverty and conflicts (Amoru, 2000; Isoun, 2006).

CONCLUSION AND RECOMMENDATIONS

It is concluded that the forest is valuable to both the urban and rural dwellers of the Niger Delta Region of Nigeria. It has also become evident that apart from crude oil, for which the region is known, the dwellers appreciate other services provided by their environment.

However, the low awareness level of some of the vital ecosystem services calls for immediate / urgent actions to be taken to make positive changes. The Niger Delta is a region where because of the difficult terrain; most of the forests (especially the mangroves) have not been lost to logging. Government and her development partners should invest in awareness creation as regards the benefits of conserving these forest resources.

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