THE GENDER-ENVIRONMENT-LIVELIHOODS NEXUS:WOMEN AS VICTIMS IN THE NIGER DELTA REGION OF NIGERIA

GIDEON E. D. OMUTA

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THE GENDER-ENVIRONMENT-LIVELIHOODS NEXUS:

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Professor Andrew G. Onokerhoraye
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PREFACE

This policy research monograph is part of the on-going research of the *Centre for Population and Environmental Development (CPED)* on the research theme titled "Growth and Equity in Nigeria" in the current strategic plan (2010-2014) of the Centre. Over the years, it has become clear that women are disadvantaged in accessing and controlling productive economic resources. These disadvantages have tended to have their consequences on various dimensions of the wider society, including the environment, environmental resources and the women, themselves. One of the very prominently topical among the issues affecting women, particularly in the developing countries, is the environment and environmental resources. It has been globally observed that men and women have different roles in our society, and that in order to fulfill these roles and responsibilities they necessarily use environmental resources differently. Strategies for the effective management and sustainability of the environment and its resources must, therefore, pay close attention to the impact of these differential roles and responsibilities, particularly on the women. This monograph focuses on the situation in the Niger Delta region of Nigeria.

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LIST OF ACRONYMS

AGC	Alliance for Global Conservation
ATRCW	African Training and Research Centre for Women
CC	Climate Change
CCC	Customs Cooperation Council
CCDI	Community Conservation and Development Initiatives
CO2	Carbon Dioxide
COMISUD	Community Initiative for Sustainable Development (Cameroun)
CPED	Centre for Population and Environment Development
CPR	Common Pool Resource
DAWN	Development Alternatives with Women for a New Era
DFID	Department for International Development
ECA	Economic Commission for Africa
EPA	Environmental Protection Agency (US)
ERML	Environmental Resources Management Limited
FAO	Food and Agriculture Organization
FHH	Female-Headed Household
FEPA	Federal Environmental Protection Agency
FGN	Federal Government of Nigeria
FLN	Laws of the Federation of Nigeria
FoEI	Friends of the Earth International
FoTE	Friends of the Environment
GBM	Green Belt Movement
GHG	Green House Gas
GTZ	*Duetsche Gesellschaft fur Technische Zusammenarbeit*
GWA	Gender and Water Alliance
HCDCS	Harmonized Community Description and Coding System
HDI	Human Development Index
ICCLED	International Convention on Civil Liability for Environmental Damage
ICF	Inner City Fund International
ICRW	International Centre for Research on Women
IDP	Internally Displaced Person
IDRC	International Development and Research Centre
IEA	International Energy Agency
IFAD	International Fund for Agriculture and Development
ILO	International Labour Organization
IPCC	Inter-Governmental Panel of Climate Change
IRP	International Resource Panel
ISDR	International Strategy for Disaster Reduction
IUCN	International Union for the Conservation of Nature
JFM	Joint Forest Management

JFMC	Joint Forest Management Committee
LEG	Least Developed Countries Expert Group
LGA	Local Government Area
LPG	Liquefied Petroleum Gas
MDG	Millennium Development Goal
MFP	Minor Forest Product
MNOC	Multi-National Oil Company
Mtoe	Million Tons of Oil Equivalent
NDDC	Niger Delta Development Commission
NDES	Niger Delta Environmental Survey
NDR	Niger Delta Region
NEMA	National Emergency Management Agency
NGO	Non-Governmental Organization
NIMET	Nigerian Meteorological Agency
NTFP	Non-Timber Forest Product
NWFP	Non-Wood Forest Product
O2	Oxygen
OAR	Open Access Resource
SLF	Sustainable Livelihoods Framework
SPDC	Shell Petroleum Development Company
SSA	Sub-SaharanAfrica
Tcf	Trillion Cubic Feet
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
WAC	World Agroforestry Centre
WEC	World Energy Council
WEO	World Energy Outlook
WWF	World Wildlife Fund

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1. INTRODUCTION

The strategic place of women has been recognized in the general development literature and theory since the 1950s and 1960s and particularly in the feminist theory since the 1970s (Snyder and Tadesse, 1995: 8). Through the years, it has become clear that women are disadvantaged in accessing and controlling productive economic resources. These disadvantages have tended to have their consequences on various dimensions of the wider society, including the environment, environmental resources and the women, themselves.

However, there has not been any consensus on the conceptual issues and approaches for dealing with these consequential challenges. Historically, among the conceptual approaches that have evolved in dealing with women-related issues in the general development literature are the following:

- ***The Welfare Approach***:
  Perceiving women's role in development as only reproductive (motherhood and childrearing) as against men's productive roles, the welfare approach sees women as passive recipients of development benefits. Programmes like family planning and activities of the United Nations Children's Fund (UNICEF) were, therefore, seen as addressing women's welfare needs, to the unfortunate neglect of their other equally essential and critical family and household roles and responsibilities (Snyder and Tadesse, 1995: 9).

- ***The Human Resource Development Approach***:
  In contradistinction to the welfare approach, the human resource development approach recognizes women as playing both reproductive and productive roles in development; and are, therefore, active participants in the economy (Snyder and Tadesse, 1995: 10).

  This is how Riby-Williams (1971) puts it:

  > Women's needs are intricately bound up with the priorities, needs and aspirations of the nation; and must necessarily be viewed as features of overall national development and the advancement of the total society.

Consequently, the human resources development approach emphasizes the point that, even at the highest level, development cannot be achieved without involving women. Leveraging on Riby-William's leadership, the Economic Commission for Africa (ECA) pioneered the human resource development approach in 1971, and raised their profile in development, by identifying women as veritable and core economic producers and community resources managers.

This was concretized with the creation of the ECA Women's Programme in 1972, and the African Training and Research Centre for Women (ATRCW) in 1975 (Snyder and Tadesse, 1995: 10). Women were no longer expected to passively wait for the dividends of development to trickle down to them. Rather, their direct access to development became an emerging issue and concern. Among the challenges that needed to be tackled pursuant to leveraging on, and maximizing their numerical strength of, either equaling, or even exceeding their male folks in the population of most nations were:

- ♠ lessening their burdens, and
- ♠ increasing their productivity, by providing or improving access to resources like land, credit, education, technology and income, among others.

- ♣ ***The Anti-Poverty Approach***:
  The emergence of the anti-poverty approach to women and development coincided with the shift to the 'basic needs' and 'absolute poverty' theories promulgated by the International Labour Organization (ILO) and the World Bank in the 1970's. Women became the central focus of the strategies to overcome the hunger and diseases that usually accompany poverty, because they and their dependent children dominated the poor groups (Snyder and Tadesse, 1995: 12). The arrowheads and anchor points of this approach were:
  - ✓ income-generating, and
  - ✓ entrepreneurship projects.

- ♣ ***The Empowerment Approach***:
  The champion of the empowerment approach was the Third World women's group called Development Alternatives with Women for a New Era (DAWN). DAWN's view of society was from the vintage point of disadvantaged, poor and oppressed women. Its emphasis was mobilization and consciousness raising, with particularly grassroots women groups and organizations as the source of empowerment. Like the human resources development approach, DAWN also stressed access to productive resources such as land, credit, education and training as catalysts. In this regard, however, Sen and Grown (1987) are of the opinion that empowerment cannot be achieved without granting 'personal autonomy' to women. By personal autonomy for women, they meant that women should be able to make their own choices and take their own decisions in the realms of politics, economics and society (*ibid:* 22).
- ♣ ***From 'Women and Development' to 'Gender'***:
  The concept of 'gender' became popular in the late 1980s as a replacement for 'women and development'. Snyder and Tadesse (1995: 14) have argued that it is a social construct that asserts that the expectations and responsibilities of men and women are not, and should not be, biologically determined. In several respects,

> gender is a second-generation concept of equity. Although information have traditionally been disaggregated or segregated by gender, current proponents of the gender concept argue that it is more robust and globally accommodating in handling issues that relate to race, class, ethnicity, and male-female power relationships (Ratheberger, 1991; Snyder and Tadesse, 1995).

Gender has become a cross-cutting, versatile concept, whose debate and interrogation are applicable at multiple levels and facets; ranging from the small household to the global economy. In between this wide spectrum of applications are a whole range of specific areas as diverse as agriculture, health, infrastructural development, politics, education, transport, as well as climate change. One of the very prominently topical among these issues, particularly in the developing countries, is the environment and environmental resources.

In this regard, and in the specific area of household livelihood assets and strategies, it has been globally observed that men and women have different roles in our society, and that in order to fulfill these roles and responsibilities, they necessarily use environmental resources differently. Strategies for the effective management and sustainability of the environment and its resources must, therefore, pay close attention to the impact of these differential roles and responsibilities, particularly on the women.

What this brief excursion reveals is that, among policy makers, reducing gender disparities has for long, been recognized as a pre-requisite for general economic development and poverty reduction. This realization is based on the facts that have emerged to the effect that the historical discrimination against women in various spheres of livelihood has inadvertently led to sub-optimal allocation or utilization of household resources (including time and energy)and that there is a clear gender bias in the expression of poverty (Udry, 1996; World Bank, 2007). Indeed, Ssewanyana and Kasirye (2010) have argued that although the third Millennium Development Goal (MDG3) directly targets the promotion of gender equality and empowering women, and that in spite of the emerging consensus that gender discrimination stifles socio-economic development, there is still an uncomfortable shortage of documented evidence on the mechanisms by which gender bias is manifested. This information gap is even wider in developing countries and even more so, among minority groups and or in marginal areas. The Niger Delta Region (NDR) of Nigeria is one of such marginal areas occupied by minority groups.

The purpose of this Report, therefore, is to enrich and enhance the documentation and literature on the subject and reduce the existing information gap by applying a gender analysis approach to the continuing debate on, and interrogation of, the gender-environment-livelihoods nexus,

using pinches of secondary evidence from the Niger Delta Region.

Idyorough (2005: 30) defines *gender analysis* as:

> "…. a close examination of a problem or situation in order to identify the gender issues related to it. It is a process through which the different aspects of gender issues in the development process are examined, unveiled, and made easily recognizable. In the examination, obstacles to progress and prospects for development are identified, the choice of intervention strategies is made and the programme to be implemented is also identified".

This is what this Report seeks to achieve within the context of the gender-environment-livelihood nexus in the Niger Delta Region. Pursuant to this objective, the rest of the Report is structured as follows.

- Materials and methods are presented;
- The concepts of gender, the environment and livelihoods and the nexus between and among them are briefly defined and discussed;
- A brief outline of the natural environmental resource base of the Niger Delta Region is presented;
- The relationships between and among women, the environment and some selected environmental resources are outlined;
- Some of the collateral damages to women arising from existing practices of gender roles pertaining to the exploitation of environmental resources are briefly discussed;
- Some perceived major policy issues and deficits are highlighted;
- A proposed agenda for mitigating some of the existing policy gaps and the burdens on women is outlined; and
- Concluding statements are made.

2. MATERIALS AND METHODS

The environment of the Niger Delta Region (NDR) of Nigeria is naturally fragile, vulnerable, delicate and very sensitive. The balance between man and nature is, therefore, so precarious that even a slight external interference or pressure could cause serious upsets, with equally grievous environmental consequences, which almost always rebound on man. However, its rich hydrocarbon bearing status has made it irresistible. Consequently, the natural, pristine innocence of the region has been progressively and massively invaded and violated. The region has now become home to unprecedented and very intense human activities, particularly with respect to the active exploration, exploitation and production of oil and gas, for over five decades. Among the major multi-national oil companies (MNOCs) operating in the area are: Shell Petroleum Development Company

Limited (SPDC), Chevron, Mobil, Elf, Agip and Texaco, which have been involved in various joint ventures with the Federal Government of Nigeria. Consequently, the population and human activities have caused the Region to be pushed to the brinks of the carrying capacities of its natural resources.

One major component of the Region's resources that has been the constant receptor of this unrelenting pressure and assault is the environment and environmental resources; particularly the forest and forest-based resources. As a result of the pervading and deepening poverty in the region, and in the absence of affordable and sustainable alternatives, the vast majority of the people, particularly in rural, but also in urban settlements, depend on natural resources for several aspects of their survival and livelihoods.

In the Niger Delta Region of Nigeria, as it is in most communities in developing countries, women make up the vast majority of the poor. Consequently women are the ones that are in the so-called ***firing line***. They are the ones in direct contact and relationship with the environment and environmental resources, because of their traditional and cultural roles as '***hewers of wood and fetchers of water***'. In their performance of these roles, women have had to resort to the environment for the collection of non-wood, non-forest and non-timber forest products (NTFPs), for their livelihoods, for the sustenance and survival of the household economy.

However, just as their traditional and cultural roles bring them into direct contact and relationship with the environment, so are women also, logically, the first to be exposed to, and the ones worst affected by any stresses and shocks experienced by the environment. This is to say that women invariably become the real scapegoats and victims of all environmental pressures and challenges.

The goal of the Report, therefore, is to ascertain whether or not, the perception that women are environmental victims and scapegoats can be sustained in the Niger Delta Region. Our operational postulation, therefore, is that **women are the victims of the environmental challenges in the Niger Delta Region of Nigeria.**

Pursuant to its goal, the Report seeks to achieve the following objectives, namely to:

- ♣ examine the traditional and cultural roles of women in the household economy,
- ♣ establish the various ways in which women depend on the environment and environmental resources for their livelihoods,
- ♣ establish some of the collateral damages of environmental pressures on women,
- ♣ outline the major policy issues, deficits and challenges, and

- ♣ propose an agenda for the way forward.

The relevant information on the Niger Delta Region are briefly outlined in the next section. However, preliminarily, we wish to quickly point out that for the purpose of this Report, the Niger Delta Region is defined for public policy expediency as the nine oil-producing states identified for the purpose of the operations of the Niger Delta Development Commission (NDDC).

The Report is executed through a very wide desk-top sourcing of information and an extensive review of materials from the following, among other sources:

- ➢ Niger Delta Development Commission (NDDC),
- ➢ Niger Delta Environmental Survey (NDES),
- ➢ United Nations Development Programme (UNDP) Annual Reports,
- ➢ UNDP Niger Delta Human Development Report (Achieving Growth with Equity),
- ➢ UNDP Human Development Report: Nigeria (Achieving Growth with Equity),
- ➢ Publications by researchers on the relevant aspects of the gender linkages with the environment and livelihoods of the area, and
- ➢ Socio-economic surveys by the member states.

The Report stands on a broad and very robust literature base of globally-established and widely-accepted linkages between and among gender, the environmental and livelihoods in developing countries, with particular reference to women's dependence on biomass energy consumption and the collection of non-timber forest products (NTFPs) in these countries, and the African continent, in general. Particular attention is paid to the studies of those countries which share similar socio-economic characteristics with Nigeria, in general, and the Niger Delta Region, in particular.

3. THE GENDER DISCOURSE

The ordinary English usage of the word 'gender' is for the classification of people into masculine (male) feminine (female) and sometimes neuter. However, in its present usage, gender refers to:

> "the widely shared expectations and norms within a society about appropriate male and female behavior, characteristics and roles. It is a social and cultural construct that differentiates women from men and defines the ways in which women and men interact with each other" (Gupta, 2000).

Gender matters are, therefore, not women matters *per se*, as it is often, but erroneously thought. However, the 'women' component of a gender matter can be isolated for consideration, analysis and emphasis; provided that such discussions are within the context of the social construction and the allocation of roles and expectations, as they pertain to the men and the women in a given society. This how Burley (2001; 65) puts it: "although these are more commonly to the detriment of females, gender should not be seen as solely a woman's problem but rather as a result of relations at political, social or administrative levels". In other words, as Idyorough (2005: 1) puts it, gender is culture specific.

In this context, ***gender roles*** are those functions that are culturally or traditionally allocated and assigned to individuals on the basis of their gender, but not necessarily related to their biological or sex functions. Therefore, in order to fully understand gender roles, they need to be differentiated from sex roles. Consequently***, sex roles*** are the functions that can be performed only by persons who have peculiar or certain unique biological characteristics (Idyorough (2005: 2). For instance, while carrying a pregnancy and breastfeeding a baby are biological or sex roles, the allocation of such household chores as washing of dishes, collection of biomass fuel (fire wood), fetching of water and cooking of meals to women are considered as gender roles. This is because while the first set can only be biologically performed by a woman with a womb and breasts, the second does not require these biological characteristics, and so could be done by both a man and a woman. In other words, while you must be a woman to carry a pregnancy, you do not have to be a woman to fetch fire wood or water or cook food.

Where and when a role is perceived as undesirable, unfair and unjust, and results in unsustainable inequality between men and women, and consequently, it is strongly felt that something should, and ought to be done to resolve it, then such a role becomes a ***gender issue***. In other words, gender issues arise from contentious gender roles. For instance, "the involvement of female children in fetching water (and fuel wood) and (doing) household chores after school, (which) denies them of useful time for studying at home and subsequently affects their school performance" is considered a gender issue (Idyorough, 2005: 3).

Subsumed under gender issues is ***gender discrimination***. Gender discrimination is said to exist when individuals are treated differently on the same matter, solely on the basis of their gender. Gender discrimination may be personally, systematically or structurally created (Idyorough, 2005: 4). In this context, Blackden and Morris-Hughes (1993), have argued that cultural norms(that is, what is and what is not allowed to be done by men and women) not only limit women's time available for productive activities, but also limit the type of economic activities that women can participate in. For instance, when the female farmer is

denied access to the farm land in deference to the male farmer, there is gender discrimination. Similarly, when the female farmer cannot be involved in decisions affecting the land on which she farms and the forest and other environmental resources that she collects for the sustenance of the entire family, there is perceived gender discrimination. Finally, when women are not allowed to cultivate some cash crops then they have been discriminated against by the system that instituted such a hindrance.

In developing countries, including Nigeria, in general, and the Niger Delta, in particular, gender discrimination and ***gender division of labour,*** deriving from gender roles, bring women more, even perpetually, in contact with the environment and environmental resources (***as hewers of wood and fetchers of water***), than men. For instance, since women are culturally assigned the role of cooking the food for the household, it is also culturally assumed that it is their implicit responsibility to source what is needed to do the cooking. For the majority of rural and poor urban households, it is biomass fuel that is used to cook family meals. Hence, culturally logically, it becomes the role and responsibility of women to collect the biomass.

4. THE ENVIRONMENT

Flowing from the foregoing brief exposition, is the clear and emphatic indication that man's relationship with the environment is gendered, to the extent that there is a strong linkage between livelihoods and some of the most fundamental household responsibilities of women, on the one hand, and environmental resources, on the other. In this section, we have further and more directly explored the concept of the environment and also further interrogated and tried to establish the relationship between the two.

Because of the fluid and diverse nature of its contents and their varied perceptions, a plethora of definitions of the concept of the environment exist in the literature, ranging from the sweeping and general, to the sophisticated and specific. Hence, Comim (2008: 6) posits that "controversies exist about the concept of environment" because it covers a wide range of ecological aspects. However, in colloquial usage, the environment is defined as our surroundings, especially the material and spiritual influences which affect the growth, development, functioning and the quality of the existence of a living being (***The Concise Oxford Dictionary, 1995***). This is in consonance with Wilkinson and Wyman's (1986) definition of the environment as: all the interacting factors and circumstances

that surround, influence and direct the growth and behavior of individual beings, groups, species and communities. Detwyler and Marcus (1972) had defined the environment as: the aggregate of the external conditions that influence the life of an individual or a population.

The environment is usually characterized and classified into two, namely: physical and cultural. The physical environment is the natural milieu, consisting of the biosphere, atmosphere, hydrosphere and lithosphere; and their inherent resources. The cultural environment, on the other hand, generally encompasses the way of life of the people of a particular geographic domain or location, including the settlements, cultural practices, historical and religious aspects of their human activities (Rau and Wooten, 1980). This dichotomy notwithstanding, the International Union for the Conservation of Nature (IUCN) has been cited as perceiving the environment, holistically, as the totality of nature and natural resources; which include the cultural heritage and the infrastructure essential for socio-economic activities (Amokaye, 2004: 24). In the same vein, Rau (1980) has defined the environment as "the whole complex of physical, social, cultural, economic and aesthetic factors which affect individuals and communities and ultimately determine their form, character, relationships and survival".
According to Amokaye (2004), the legal definition of the environment is extensive and integrative in nature and incorporates the natural, human and non-living inhabitants of the planet. Thus, in Nigeria, for instance, the Federal Environmental Protection Agency (FEPA) Act (FGN/FLN, 1990) defines the environment to include the water, air, land, and all plants and human beings or animals living therein and the relationship between and among them. Similarly, Amokaye (2004) has cited the International Convention on Civil Liability for Environmental Damage (ICCLED) as defining the environment to include both biotic and a biotic (non-living) resources.

Thus, the definition of the environment could be extended to include not only the natural environment but also the man-made environment which accommodates man-made landscapes, buildings, and objects which form part of man's cultural heritage. In the opinion of Kofi Anan, from whatever perspective we define the environment, it is the source of sustenance that humanity depends on; for food, fuel, medicines and materials (Amokaye, *ibid:* 5). A logical extension of these definitions is that since the mix of physical and man-made conditions almost always varies from place to place, the character and quality of the environment will correspondingly vary from place to place.

From the above sample of definitions, it is impossible to over emphasize the fact that we should and must be concerned about the environment, because within its definition are embedded the linkages with livelihood assets and livelihood

strategies, especially since the poor collect these from nature and natural resources. More explicitly, the environment is significant to survival, generally and livelihoods, in particular because:

- ♣ it is the life-support system for planet earth, including the livelihood assets of rural poor communities,
- ♣ it is the ecosystem within which all living organisms (including man who uses its resources for livelihood) interact with the physical elements (Oladipo, 2001: 340),
- ♣ as the global life-support system, it drives a number of ecological processes that control the climate, cleanse the air and water, regulate water flow, recycle essential elements, create and regulate soils and keep the earth perpetually fit for life and living (IUCN/UNEP/WWF,1991),
- ♣ as a dynamic life-support system, its capacity to sustain human life and support the development of human cultures depends on the extent to which the effects of human activities are kept, and remain, within safe bounds,
- ♣ uncontrolled effects of human activities (including the exploitation of natural environmental resources such as forest and non-timber forest products) can destroy the (biological) diversity, complexity and function of the global ecological life support system (Contanza, 1991),
- ♣ in his interaction with the natural environment, man faces a number of shocks, stresses, challenges and threats, which have been summarized in terms of some ecological laws. Sada (1988: 28, 29) has distilled the over twenty such ecological laws identified by Dausereau (1966) into four major ones, namely; that:

- ➢ "no species encounter in any given habitat, the optimum condition for all its function". This is otherwise known as the ***law of inoptimum,*** which suggests that because of man's original ineptitude, changes, challenges and adjustments are inevitable in man-environment interactions. Consequently, given the inherent limits of given environments, inadequacies and less-than-satisfactory options will always be with humanity,
- ➢ "on the average, organic evolution is slower than environmental change". This is the ***law of aphasy*** which implies that the rate at which human activities (including the dependence on biomass energy and non-timber forest products) degrade the environment is faster than the rate at which the environment regenerates and renews itself,
- ➢ "a specie is ecologically and geographically confined and limited by the extremes of the environmental adversities that it can withstand". This is the ***law of tolerance***, which suggests that there is an ultimate carrying capacity or limit to human (organic) survival, and

- "although living beings react holocenotically (to all factors of environment in their peculiar conjunction), there frequently occurs a discrepant factor that has controlling power through its excess or deficiency". This is the ***law of factorial control*****,** which stresses that uncontrolled concentrations of intruding, modifying or polluting agents and substances (such as environmental stresses and shocks caused by climate change, droughts and floods), on the one hand, and or the depletion of essential elements (such as biomass and non-timber forest product exploitation), on the other, could threaten the environment,

- humanity's development depends on it (the environment)in a number of ways. Among those identified by Morvaridi (1996), are that the environment is:
  - a source of food, income, raw materials , energy, among others,
  - aprovider of services for the maintenance of climatic systems and ecological cycles, including forests, non-wood, non-forest and non-timber forest products, agricultural lands, water, among others, and
  - a sink for the waste by-products of development.

In linking the three with particular regard to the household energy needs of the poor, Kozulj (2010: 65) has asserted that the dependence on biomass energy, through the use of fuel wood for cooking is almost invariably a clear indicator of the poverty that is associated with lack of access and ability to afford clean and modern sources of energy for such purposes. Consequently, and for such poor households, the only option left is to assault unprotected, vulnerable natural resources. The environment becomes the receptor of the pressure of the energy-poor.

If we accept the warning that unless there are new strong and responsive control policies, the number of people that will rely on biomass fuels to meet their energy need for cooking will increase to over 2.6 billion by 2015 and to 2.7 billion by 2030, due largely to population growth and stagnant or sluggishly responding per capita incomes (WEO, 2006: 431), then the poor would be expected to continue to put pressure on the environment in order to meet their basic household energy and indeed other needs.

The general consensus is that the sustainability of the utility of natural ecosystems is under severe threat, as their resources are currently being stressed and shocked by unprecedented pressures from the demand to meet man's needs. These pressures were adequately captured by Oladipo (2001: 341, 342) in his argument that "human activities are radically altering the ecological processes that make the planet (earth) fit for life (and living), through global pollution and the

destruction or degradation of the ecosystems". He concludes very perceptibly by warning that "within the development context, there is a general realization that if the present rate of human-induced resource depletion continues unchanged and unmitigated, the limits to growth on the earth could be reached in less than 100 years, irrespective of our faith in technology".

Since the late 1960s, African leaders have recognized the very significant importance of the environment and its diversity of resources to the development of their economies. Consequently, they have taken steps to protect and conserve their environments. Some of these steps include the adoption of:

- The African Convention on the Conservation of Nature and Natural Resources; the so-called ***Algiers Convention*** of 1968 (OAU, 1968);

- The 1991 ***Bamako Convention*** on the Ban of the Import into Africa and the Control of Trans-boundary Movement and Management of Dangerous Wastes within Africa (Amechi, 2009);

- The ***Nairobi Convention*** for the Protection, Management and Development of Marine and Coastal Environment of the East African Region (www.unep.org/Nairobi Convention/docs/English_Nairobi_ Convention_Text.pdf); and

- The Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (http://www.opeworg/chemica-weapons-covention/related-international-agreements/toxic-chemica-weapons-and-the environment/marine-and-coastal-environment-west-and-central-africa/).

At the individual country's level, a myriad of instruments have also been adopted to protect the environment so that it can stimulate, enhance and continue to sustain socio-economic development. For instance, countries like Angola, Republic of Benin and Republic of South Africa have enshrined in their various constitutions, their commitment to protecting the health and well being of their people as well as the flora and fauna; and guaranteeing an unpolluted environment.

Specifically, ***The 1999 Constitution of the Federal Republic of Nigeria*** recognizes the importance of improving and protecting the environment and its resources and accordingly makes copious provisions for it. Particularly:

> ***Section 20*** makes it an objective of the Nigerian State to protect and improve the environment and safeguard the water, air and land, forest and wildlife. By implication, therefore, this section provides for the

protection of the livelihood assets and strategies of those who depend on environmental resources.

Section 12 establishes, though impliedly, that international treaties (including environmental treaties) ratified by the National Assembly should be implemented as law in Nigeria. The implication is that this section allows Nigerian environmentalists to draw from relevant international experiences on how comparative states have tackled the kind of environmental challenges confronting us).

Sections 33 and 34guarantee fundamental human rights to life and human dignity, respectively, which can and have also been argued to be linked to the need for a healthy and safe environment, in order to give effects to these rights. These section, therefore, impliedly seek to protect those who are traditionally, and by their gender roles, inevitably exposed to the dangers associated with the use of environmental resources.

5. LIVELIHOODS

Livelihoods are the collection of capabilities, strategies activities, assets (including material and social resources) and the access that are required, and jointly determine the living gained by the rural households (Chambers and Conway, 1991; Ellis, 1999). Livelihoods, thus, do not mean just income; rather they encompass social institutions, gender relations, and property rights required to support and sustain a given standard of living (Sharma, 2010). Livelihoods are considered sustainable when they can cope with, and recover from, stresses and shocks and maintain or enhance their capabilities, assets and capacities to meet a people's needs, not only now but also in the future; while not compromising, undermining and or jeopardizing the natural resource base (Carney, 1998). Within the rural setting, Nazneen (2010) asserts that livelihoods constitute a key area for understanding how gender operates in limiting or expanding men's and women's access, options and choices regarding the use of resources and their material conditions.

In order to better understand how people develop and maintain livelihoods, the UK Department for International Development (DFID) developed the Sustainable Livelihoods Framework (SLF), building on the work of various practitioners and academics. The SLF views livelihoods as systems, and provides a way to understand the:

- *assets* that a people draw upon to gain a living,
- *strategies* that they develop and or adopt to make a living,
- *contexts* within which a livelihood is developed and sustained, and

- ♣ factors that make a livelihood more or less *vulnerable* to shocks and stresses (ISDR, nd: 1).

Livelihood assets could be tangible, such as natural capital that include trees, land, livestock, water and water bodies; tools; and other physical resources. They could also be intangible, such as the '*claims*' that one can make for food, work, and *assistance* as well as *access* to materials, information, education, credit, all forms of capital, health services and employment opportunities (ISDR, nd: 1).

Livelihoods are formed within given social, economic, physical and political ***contexts.*** Institutions, processes and policies (such as culture, social norms, particularly, as they relate to the ownership of assets such as land) affect our ability to access and use livelihood assets for a sustained positive outcome. Livelihoods are, therefore, context-specific. Consequently, as these contexts change, they could also create new livelihood challenges and or opportunities, as the case may be. Within the context of the Niger Delta Region, Kabeer and Anh's (2000) argument can be presented as follows: that livelihood strategies are shaped by a broad range of *economic, political*, *environmental* and *social* factors; and vary markedly between economic necessities (such as responding to shocks, stresses, vulnerability and poverty), as they apply to the poor rural women, on the one hand, and choices (as a way to further investment, savings and accumulation), on the other.

For instance, within the context of social relations, the way in which gender, ethnicity, culture, history, religion and kinship affect livelihoods differ from one group to another and from one community to another. On the other hand, within the context of the physical environment, livelihoods are often shaped by the changing natural environment. The determining factors include: the quality of soil, air and water; the climatic and geographic conditions; the availability of fauna and flora; and the frequency and intensity of natural hazards, all of which influence livelihood decisions and choices (ISDR, nd: 2).

The way that a given people access and utilize their livelihood assets, within the aforementioned social, economic, political and environmental contexts, constitutes a ***livelihood strategy***. According to Sconner, (1998) and Bebbington (1999), livelihood strategies are the sum total of all the different activities that people do in the given context of their livelihood, and are based on the access to, and combination of, five forms of capital assets, namely; human capital, natural capital, financial capital, social capital, and physical capital. In this context, the World Bank, the Food and Agricultural Organization (FAO) and the International Fund for Agriculture and Development (IFAD) (2008), are of the opinion that livelihood strategies are influenced by the following factors:

- ❖ access to, and control over, various assets;

- access to (product and raw material) markets, information and organization;
- effective management of uncertainties and vulnerability; and
- the interactions between and among these policies at the global, national and local levels.

It is, therefore, logical to expect that there should be a very wide variety of livelihood strategies. For instance, while one individual may be engaged in one activity to meet all or a vast majority of his or her livelihood needs, another individual may take on several activities before his or her needs can be met. Also, while only one 'strong and viable' person may be engaged in contributing to a particular household livelihood strategy, several persons may be engaged in different activities that contribute to a collective livelihood strategy. Thus, quite often, especially, where and when the assets are lean, in some households, its individual members may be compelled to take on different responsibilities to ensure the sustenance and improvement of the family (ISDR, nd: 3).

The strength or capability of given assets to sustain livelihoods is not measured solely by their quantity, productivity and productive outcomes, but equally by their resilience to uncertainties, shocks, stresses, seasonal changes(including climate change)and trends. The shocks and stresses that affect livelihood assets could be very varied, including ill-managed human activities (such as oil spillages and large scale illegal logging), natural disasters (such as flooding or drought), communal crises, economic meltdowns and down turns and political policy summersaults.

Consequently, the livelihood assets and strategies of some people may be unstable, because the availability of some resources, income-generating opportunities, and demand for certain products and services may fluctuate erratically or seasonally, and sometimes very violently. Even given gradual and predictable trends in politics and governance, technology use, economics, and availability of natural resources, there could still be daunting challenges for the future of some livelihoods, making them vulnerable.

Livelihood vulnerability relates to the sensitivity of the availability of livelihood assets and strategies to the factors identified above, and how they affect the opportunities to transform those assets into a sustainable 'living'. When livelihoods become vulnerable, the victims must either adapt existing strategies to changing circumstances or develop new strategies in order to survive in a given vulnerable circumstance (ISDR, nd: 3).

Experience has shown that very few livelihoods exist, and can be considered in complete isolation of all others. Rather, quite often, a given livelihood may rely on another or other livelihoods to access and exchange assets. For instance, commodity traders rely on farmers to produce goods, processors to prepare them, and consumers to buy them. Similarly,

traditional medicine practitioners depend on the collectors of non-timber forest products and biodiversity such as leaves, roots, barks, and animal parts for their preparations and the health care seeking public who use them. Livelihoods also compete with each other for access to assets and product markets. For instance, there could be competition in the demand for collected biodiversity, between food and traditional medicine. Thus, positive and negative impacts on any given livelihood will, in turn, impact others. This is to say that ***livelihoods are interrelated and interdependent*** and constitute a system (ISDR, nd: 3).

However, as Dolan (2002) has argued, the gender of household members not only shapes access to particular livelihood opportunities but also the way in which social norms are expressed materially in terms of livelihoods. For example, local and traditional conceptions of gender rights and responsibilities (e.g. men's work versus women's work; or men's expenses versus women's expenses) will determine the possibilities for engaging in a number of economic undertakings.

Consequently, the potential to exploit particular livelihood assets (such as particular environmental resources like forests, farm land and rivers) or to capitalise on a livelihood option (such as cash crop farming as against collection of non-timber forest products) is as much governed by the social meanings attached to particular tasks (e.g. men do the logging, while women collect the non-timber forest products) and modes of income generation (e.g. men cultivate export cash crops, while women cultivate domestic food crops) as to the individual bearer of gender. Hence, it is necessary to discern the nature of gender relations, in order to be able to provide a clearer picture of intra-household obligations and exchanges, as well as show how livelihood strategies are negotiated, structured and legitimated through broader ideological processes (Dolan, 2002).

Given that livelihood assets and strategies are context-specific, Onakuse and Lenihan (2003: 4) have argued that in the context of the predominantly rural communities of the Niger Delta Region of Nigeria, livelihood systems and livelihood strategies must be seen as much more than just sets of material and economic conditions, because, while rural dwellers have to cater for a large number of household needs, including food and shelter, they also need to address other peculiar and unique concerns of human attachment to the environment and its resources. Hence, the sustainability of rural livelihood support systems is not only a matter of the quantum of physical resources and how long they can last, but also of psychic fulfilment and cultural meaning attached to them.

Livelihoods in the greater part of Niger Delta Region, particularly in the rural villages, are constantly exposed to the negative impact from environmental pollution and degradation. Because of their sensitivity to these assaults, these livelihoods have become very unstable and vulnerable. Consequently, the

region has been experiencing huge losses in the sheer stock, and deterioration and modification of the quality of both flora and fauna. These are the major sources of livelihoods of the indigenous people, namely: farming and fishing practices; and the collection of a very wide variety of non-wood or minor forest or non-timber forest products.

The scenario presented above indicates that the ability and capability of traditional livelihoods in the Niger Delta Region of Nigeria to meet the needs of the people have been under very serious threat. The victims at the receiving end are the poor who bear the brunt of environmental despoliation, natural hazards, biodiversity loss and the depletion of forests, pollution (air, water and soil), and the negative impacts of industrial activities (Onakuse and Lenihan, 2003: 6). Fishing, agronomic and related activities which are the major livelihood activities of the people in this region are affected, resulting in declining production and productivity (Figure 1) (Onakuse and Lenihan, 2003: 5).

Figure 1: The impact of oil pollution (spillage) on a cassava farm (a major livelihood asset) in Ikot Ada Udo, Akwa Ibom State, Niger Delta Region, January 30, 2008.
Source: *Nigeria: Petroleum, Pollution and Poverty in the Niger Delta;* Amnesty International, (June, 2009), (cover page)

We reiterate that environmental resources are of core importance to the poor rural women of the Region because their livelihood options are very limited and highly circumscribed. Indeed, their very existence is either totally limited to, or relies to an overwhelming extent on various subsistence endeavours, which depend only on natural environmental resources. The rural poor perceive their well-being as ultimately and inextricably tied to the environment in terms of food, incomes, health, and the general ability to be in control of their lives. Furthermore, poor people, particularly women, are more vulnerable to uncertainties and changes; and the shocks and stresses in the environment. These gendered unfavourable outcomes are, in part, because their marginalization and social, political and economic exclusion means that women almost always have fewer windows open through which they can escape in the event of environmental reverses.

For instance, in 1980, at Finuwa, Sangana, when one of the oil wellheads blew out, the entire jack-up rig was razed down and an estimated three million barrels of crude oil were spilled into the environment, over a period of over four weeks. Consequently, the livelihoods of the women whose survival security strategies are woven around the environment as the sole source of food gathering were completely destroyed. This created a period of untold hardship in the affected communities. This vulnerability was (and is still being) further aggravated and compounded by unmitigated gas flaring and indiscriminate dumping of untreated drilling water-based wastes on land and into the swamps (Onakuse and Lenihan, 2003: 8). The Finuwa disaster experience can be replicated in hundreds of communities across the Niger Delta Region.

6. THE NEXUS

The relationships between and among gender, the environment and livelihoods in the Niger Delta Region are rather complex, but very critical to the understanding of the sustenance of the area's household economy. This is because the nexus represents the pillars of the gendered burden of survival of the inhabitants of the region. The relative impact, especially of the environment on livelihoods must be appreciated, if their interdependence and interrelationships must be properly understood, so that they can in turn be effectively managed. This understanding is even more importantly underpinned by the incontestable need to sustain the environment, and thereby sustain the livelihoods of the women who depend rather overwhelmingly on them for maintaining the household economy. The gender-environment-livelihoods nexus is, therefore, very critical in the global efforts at promoting and achieving a green economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2010a; UNEP, 2010b).

As Farrington, Carney, Ashley and Cathryn (1999), have observed, the environment is a collective natural asset and livelihood building block, because it is essential for a wide range of activities, including agricultural production and allied activities, but probably even more importantly, for its biodiversity, non-agricultural, forest and non-forest products. As the sustaining fabric and foundational infrastructure, environmental resources include land, water, air and others that are regarded as the free gifts of nature. They are the so-called natural resources which according to Odje (2003),refer to all materials in their natural states that when extracted, have economic value. They, therefore, include not only the more common and well-known items like timber, land, oil and gas, coal, other minerals, lakes and submerged lands, but also the very wide variety of less fancied non-timber forest products (NTFPs) and all other elements which supply and meet human needs by making invaluable contributions to the health, welfare and benefit of the larger community. These are the sources of materials and processes required to build up the stock of other capital assets and are subsequently tapped by inhabitants of a region for securing their livelihoods.

It is against this background that Nanda (nd: 13) has asserted that, all things being equal, in playing their roles as hewers of wood and fetchers of water (collected from the natural environment and its inherent resources), women, particularly those living in rural areas, are equipped and positioned to play very vital roles in the conservation, management and sustainability of the ecosystem, due to their age-long association and affinity with the land, water, forest and other natural resources.

In this Report we are concerned with those roles that the Nigerian society has culturally and traditionally assigned to women in the Niger Delta. In this regard, the linkages between and among the poor rural women, their livelihoods, and the environment in the Nigeria Delta Region may be viewed against the background of a number of perspectives that have been established from the findings of various studies of the area. These include that:

- environmental resources are of core significance to the sustenance of livelihoods in the Region. This is because the vast majority of the poor households in the Niger Delta Region depend on 'free' biomass and other Common Pool Resources (CPRs),
- women are the primary gatherers, custodians, processors, consumers and managers of biomass fuels and other perceived minor environmental resources, especially non-timber forest products (NTFPs), and
- women's roles and responsibilities are pivotally critical, not only to the management of environmental resources, but also to the management of the domestic economy and the sustainability of the livelihoods of the Region (Inoni,

2009; Wokocha, 2010; Omuta, 2011).

These perspectives have informed Chinweze, and Abiola-Oloke's (2009: 9) assertion that women are the principal and customary caretakers and mid-wives of environmental resources. Consequently, and based on their cognate experience, they are strategically positioned to make copious contributions to various aspects of household management, particularly in the Niger Delta Region. They bear the burden of raising and nurturing their families, sometimes even as the breadwinner of their family unit, especially within an internally competitive polygamous setting, as is very prevalent in the Niger Delta. They provide the basic needs of their households, especially food and household cooking and heating fuel and energy. They also supplement household livelihoods and sustainability with incomes from various undervalued and perceived minor, but very critical environmental resources, especially, non-timber forest products and the region's very rich, but increasingly threatened and depleted biodiversity. In other words, the pressure to meet the food and energy needs of the household is culturally and traditionally transferred directly to, and borne by, the women of the region. In the face of a gender discriminatory environmental management and policy framework, these women become the first and most major victims as they are put under corresponding pressure to over-exploit the slim, fragile and already heavily depleted natural environmental resources. Such pressures further stress the environment and eventually endanger the livelihoods of women, in a self-debilitating vicious circle.

Based on their affinity with them, women appreciate that natural environmental resources are the back bone, indeed the economic base and foundation of the village and rural economy. Furthermore, they appreciate that these resources can, and have indeed provided employment, sustenance and livelihoods to the vast majority of past generations of rural people. They are, therefore, expectedly and logically more concerned about the need for the proper management of these natural resources, if only to ensure the perpetuity of their utility and service, towards sustainability of rural livelihoods and ultimately reduce the burden that society has placed on them. Put differently, the affinity that women have with nature and natural resources promotes a unique culture of respectful use and conservation of the environment, so that they can bequeath to future generations as a legacy, what we got from our ancestors. This is in consonance with an Ijaw adage that: "***We did not inherit the world from our fathers; we borrowed it for our children***" (Ogon, 2006). Therefore, women give more consideration and effort to the protection and improvement of the capacity of nature and natural resources than men do (Nanda, nd).

Women's concern for the conservation of the environment and sustainability of the livelihoods it supports is borne out of the fact that when and where there

are fuel, food and or water crises as a result of environmental uncertainties, reverses, stresses and shocks, such as climate change, droughts, deforestation, oil spillages, floods and gas flaring, it is the women folk that are either the only victims or the major victims. They suffer first and most severely; by walking longer distances; and spending more time and energy, looking for, and fetching them. These not only leave them with little or no time to engage in mainstream income-earning activities, but also take a toll significant on their health, besides other attendant risks. As a result of the vulnerability of their livelihoods, women, therefore, become the indisputable victims and scapegoats that bear the brunt of every act of environmental carelessness, rascality and irresponsibility. As Wangari Maathai, the Nobel Peace Prize winner and founder of the Green Belt Movement (GBM) is quoted to have put it: "When the environment is destroyed, plundered, or mismanaged, it is women's quality of life, and that of their children and families, that is ultimately undermined" (AGC, 2009).

7. THE NIGER DELTA REGION: ITS ENVIRONMENT AND LIVELIHOODS

The Niger Delta Region of Nigeria may be defined in two ways, namely; the geographic or cartographic definition and the public or political policy definition. Geographically and cartographically, the Niger Delta Region is defined as comprising the area drained by the ***natural delta of the Niger River*** and the areas to the east and west, which also produce oil. The natural limits of the geographic and cartographic Niger River Delta can be defined by its geology and hydrology. Its approximate boundaries are located close to the bifurcation of the Niger River at Aboh, to the north, around the Benin River, to the west and the Imo River, to the east. The area covers approximately 25,900 square kilometres (ERML, 1997). The geographic co-ordinates are between Aboh (050 33′ 49"N; 060 31′ 37"E) in the north and Palm Point (040 16′ 22"N; 060 05′ 27"E) in the south; the east-west limit stretches from the Benin River estuary (050 44' 11"N, 050 44′49"E) in the west to the Imo River estuary (040 27′ 16"N, 050 35′ 27"E) in the east (NDES, 1997).

However, the Niger Delta Region for public and political policy and planning purposes is broader and considerably larger. It includes all the oil producing communities and other areas considered relevant for reasons of administrative convenience, developmental objectives and political expediency. This extends and triples the land area to approximately 75,000 square kilometres. This is the definition used by the Federal Government of Nigeria as expressed in the instrument establishing the Niger Delta Development Commission (NDDC). Thus defined, the Niger Delta Region consists of nine states, namely:

- Abia,

- Akwa Ibom,
- Bayelsa,
- Cross River,
- Delta,
- Edo,
- Imo,
- Ondo, and
- Rivers (Figure 2), and their 185 local governments; divided into 800 communities of 12 major ethnic groups (FGN, 2004).

This Report adopts the latter (public policy) definition of the Niger Delta that has been officially accepted for the purpose of dealing with the unique environmental and livelihood challenges associated with the exploitation of hydrocarbon (oil and gas) resources in the region.

The rich and diversified natural resource base of the Niger Delta has been abundantly documented (FGN, 2004; UNDP, 2006). Perhaps its most common physical feature are the forests (Figures 3 and 4). Traditionally, forest resources are distinguished into timber and non-wood, non-forest or non-timber forest products (NTFPs). In this Report our brief excursion is into forest and non-timber forest resources, because as Myers (1988), and Panayotou and Ashton (1992) have rightly concluded, NTFPs contribute more than timber to the livelihoods of poor forest and other rural people.

However, regarding the broad dichotomy between timber and non-timber forest products, Ahenkan and Boon (2011: 2) have argued that the term NTFPs has proved rather difficult to define amongst forest experts, conservationists, development organisations, environmentalists and the pioneers of the concept. This they attribute to "some of the blurred boundaries between timber and non-timber products; the underlying difficulty in defining a forest and the evolving nature of the concept and the potential to bring together a diverse set of interests and experiences to the idea of integrated forest management".

Consequently, in the literature, minor forest products (MFPs), non-wood forest products (NWFPs) and non-timber forest products (NTFPs) have been used rather interchangeably and synonymously. In confirming this basic lack of consensus they have presented a sample of definitions by various proponents, as shown below.

De Beer and McDermott (1989)
The term "Non-Timber Forest Products" (NTFPs) encompasses all biological materials other than timber, which are extracted from forests for human use.

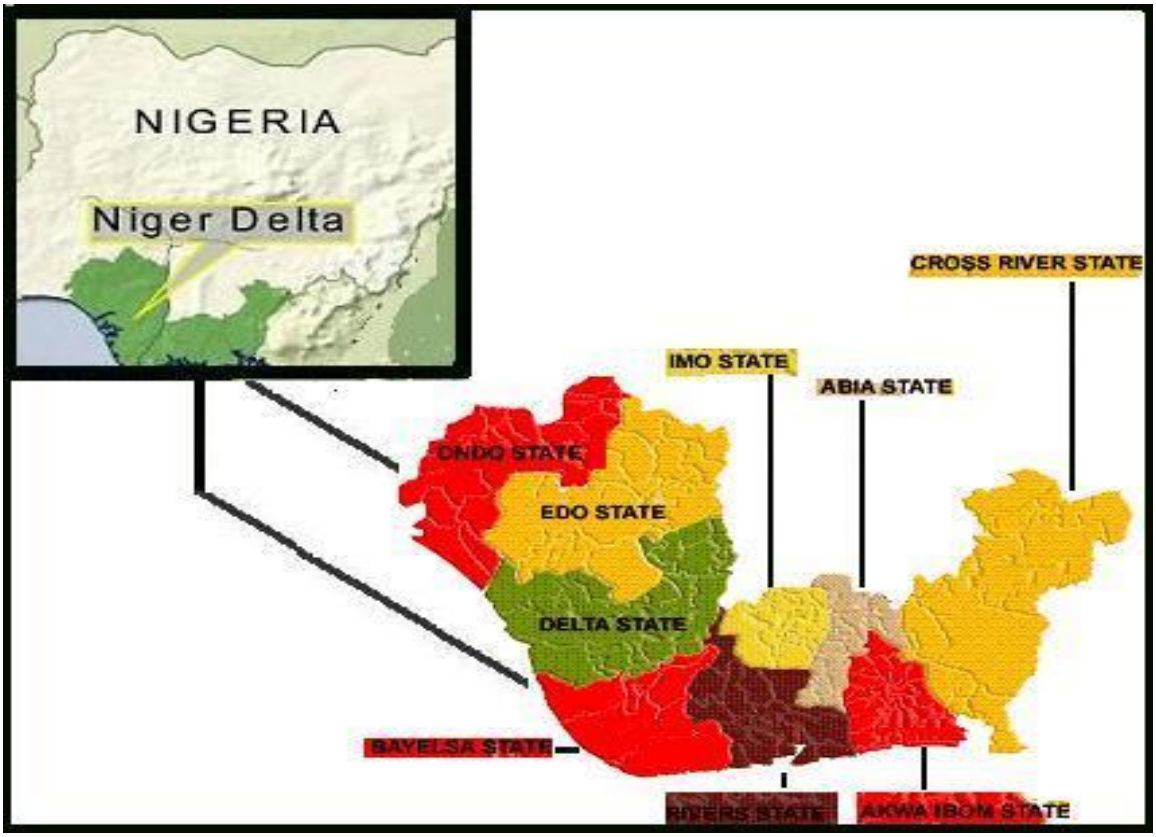

Figure 2: The Niger Delta Region of Nigeria

Chandresekharan (1995)
Non-Wood Forest Products (NWFPs) include all goods of biological origin, as well as services, derived from the forest or any land under similar use, and exclude wood in all its forms.

Ros-Tonen, et al. (1995, 1998)
"All tangible animal and plant products from the forest, other than industrial wood". In 1998, they slightly modified this definition to include "….all tangible animal and plant forest products other than industrial wood, coming from natural forests, including managed secondary forests and enriched forests".

Mathur and Shiva (1996)
All products obtained from plants of forest origin and host plant species yielding products in association with insects and animals or their parts and items of mineral origin except timber, may be defined as Minor Forest Products (MFPs) or Non-Wood Forest Products (NWFPs) or Non-Timber Forest Products (NTFPs).

Figure 3: A typical mangrove swamp of the Niger Delta Region of Nigeria
Source: Google images: whitmer.wikis.birmingham.k12.mi.us

Shiva (1998)
All usufructs/utility products of plant, animal and mineral origins except timber, obtainable from forests or afforested / domesticated land areas are termed as Non- Timber Forest Products (NTFPs) or Non-Wood Forest Products (NWFPs)/Minor Forest Products (MFPs).

FAO (1999)
Non-Wood Forest Products (NWFP) are defined as 'goods of biological origin other than wood derived from forests, other wooded lands and trees outside forests' (FAO, 1999).

Wong (2000)
'...all products derived from biological resources found on forest land but not including timber, fuel wood, or medicinal plants harvested as whole plants'

*(**Sources:*** Rajesh Rajchal 2006; Pfund and Patrick Robinson , 2002; as adopted from Ahenkan and Boon, 2011: 3)

Figure 4: Another typical mangrove swamp of the Niger Delta Region of Nigeria
Source: Google images: sb.westfordk12.us

This diversity of definitions and contents, notwithstanding, experts in biodiversity and conservation are in implicit agreement that forests can be likened to the lungs of the planet, on the basis of the fact that its destruction diminishes the quality of human life. In other words, the forest is an important component to the sustenance of life. This is more so in developing countries, and even more particularly in poor, rural forest communities which tend to depend overwhelmingly and very directly on it. However, as the primary sustainer of rural communities and their livelihoods, the forest does not stand alone, merely as a community of trees, rather, it consists of the trees, various plant species, animals and birds, the insects, soil and water. The totality of these makes up the ecosystem.

Against this background, the Niger Delta Region is one of the world's three largest wetlands; and Africa's largest delta, with the outermost coastal forest zone representing some of the last remaining pristine forest resources and centres of endemism in Africa (FRN, 2004). The Region has four broad ecological zones, distinguished on the

basis of relief and hydrological characteristics. These are, from the coast inland, the:

- coastal sandy barrier ridge zone,
- mangrove swamp zone,
- freshwater swamp zone, and
- Lowland rainforest zone.

It is with regard to the economic activities that this Report examines the environmental issues and challenges in the Niger Delta as they negatively impact upon women and their livelihoods.

There are many uses into which forests are, and can, and have been put. In the Niger Delta, forest dependency by the communities that live in them or at their fringes, is an age old tradition. This is because the extraction of its diverse resources meets the various needs of the local population, ranging from household energy, food, medicines and items of market trade to generate income. Indeed, living in rural communities in the Niger Delta essentially revolves around its forests and the resources that are found in and around them (Ogon, 2006: 10). However, the specific local livelihood assets and strategies tend to vary from one ecological zone to another.

Generally, the traditional economically significant forest resources are timber for sawn logs, electricity transmission poles, building (walling and roofing) members, bamboo, fuel wood and chewing stick, among others. Sawn logs are available mainly in the ***freshwater swamp zone.*** Very few areas of natural lowland rain forests remain in the Niger Delta, as most of them have been converted to farmlands and degraded from primary to secondary. The ***coastal beach ridge forests*** with species similar to those of the ***rain forests*** are another source of NTFPs. However, given the small extent of this area, the resources available are correspondingly quite limited.

In addition to those already mentioned, other types of non-timber forest resources that are also important to the local economy include oil palm, raffia palm, various fruits, such as bush mango, spices, various roots, tree barks, a variety of leaves, various climbers, and animal protein sources, like giant snails and wild game. Rural dwellers, especially the women and the poor, rely to a very large extent on these non-timber forest products for their vegetable and protein sources (FGN, 2004: 77). Leaves, roots and bark of some trees found in the forest of the Niger Delta are known to serve as sources of some potent traditional medicines.

In the ***mangrove*** and ***fresh water swamp systems*** women engage in farming, mainly for subsistence, and depending on the availability of arable farmland. According to Irikana (2011: 49), the quality of the people's lives and their continued survival in the region are inextricably tied to the continued and abundant availability and existence of mangrove forest resources. In the ***lowland rain forests***, women's major economic activity is farming. Collection

of snails and other non-timber forest products, weaving, fuel wood gathering, tapping of rubber trees, among others, are the other sources from which women generate revenue and derive their livelihood. Fishing in this zone is practiced on a very low scale, mainly for subsistence. Pottery making and trading cut across the four ecological zones of the Region. In fact, women dominate the retail trade, at both local and long distance levels in the Niger Delta Region.

Ahenkan and Boon (2011) have attempted to classify non-timber forest products according to the generic base of product (plant products, animals, and animal products); end use (medicine, food, drink, among others); by the part used (roots, leaves, barks, among others); or in accordance with major international classification systems such as the Harmonized Community Description and Coding System (HCDCS),developed under the auspices of the Customs Cooperation Council (CCC), as presented in Table 1.

Table 1: Categories of Non- Timber Forest Products (NTFPs)

Plant Products		**Animals and Animal Products**	
Categories	**Description**	**Categories**	**Description**
Food	Vegetal foodstuff and beverages provided by fruits, nuts, seeds, roots	Living animals	Mainly vertebrates such as mammals, birds, reptiles etc.
Fodder	Animal and bee fodder provided by leaves, fruits, etc.	Honey, beeswax	Products derived from, or provided by bees.
Medicines	Medicinal plants (e.g. leaves, bark, roots, fruits), used in traditional medicine and/or by pharmaceutical companies	Bush meat	Meat provided by vertebrates, mainly mammals
Perfumes and cosmetics	Aromatic plants, providing essential (volatile) oils and other products used for cosmetic purposes	Other edible animal products	Mainly ediblein vertebrates such as insects (e.g. caterpillars), crabs and other "secondary" products of animals (e.g. eggs, nests)
Dying and tanning	Plant material (mainly bark and leaves), providing tannins and other plant parts (especially leaves and fruits) used as colorants	Hides, skins	Hide and skin of animals used for various purposes
Utensils, handicrafts	Heterogeneous group of products including thatch,	Medicine	Entire animals or parts of animals such as various

	bamboo, rattan, wrapping leaves, fibres (e.g. Arouma, Bwa Flo, Silk cotton floss, Screw pine)		organs used for medicinal purposes (e.g. caterpillars, crab legs, snake oil)
Construction materials	thatch, bamboo, fibres,	Colorants	Entire animals or parts of animals such as various organs used as colorants
Ornamentals	Entire plants (e.g. orchids, ferns, philodendron) and parts of the plants (e.g. pots made from roots) used for ornamental purposes	Other non-edible animal products	e.g. bones used as tools
Exudates	Substances such as gums(water soluble), resins (water insoluble) and latex (milky or clear juice), released from plants by exudation		

Source: Adapted from FAO 1995; Shiva and Verma 2002 (adopted from Ahenkan and Boon, 2011: 3).

Against the background of this classification, a composite picture of the place of the ecology and some of the non-timber forest products of the Niger Delta region in the gender-environment-livelihood nexus is presented by Gabriel (nd: 1,2) as follows:

> ***Coastal ridge barriers, mangrove and fresh water swamp forests*** characterize the ecology of the Niger Delta and lowland rain forest, each of which provides habitation for different species of plants, fish, reptiles, mammals and minerals. The Niger Delta ecology largely determines women's economic endeavours, the rural women in particular. The soil types, water, climate, physiographic structure, plants, animals and human beings (ecological factors) interact, utilizing the vegetation types in the Niger Delta.

Women in the Niger Delta ***mangrove forest ecosystem*** engage themselves in mainly fishing and gathering of sea foods. A dense vegetation of mangroves in their marine and brackish habitats found along numerous rivers and creeks have become dependable sources of fuel wood for domestic and small-scale food processing

as well as income generation.

Similarly, the ***fresh water swamp forest ecosystem*** occurring around fresh water creeks and lakes support women's fishing activities, gathering of sea foods, fuel woods, gin distillation from raffia palm trees (*Raphiavinifera*), collection of African mango seeds*(ogbono)* (*Irvingiagabonensis*), snails, weaving of mats and other objects or items from screw pine (*Pandus candelabrum*), rattan palms and bulrushes respectively.

8. WOMEN'S LIVELIHOODS IN THE CONTEXT OF SELECTED ENVIRONMENTAL RESOURCES

Joab-Peterside (nd: 1) has asserted that women in the Niger Delta have long been victims of gender-bias discriminatory practices and economic crises.To seek to confirm the veracity of this assertion, this Report examines the relationships between and among women, the environment and their livelihoods. This done by briefly exploring three pairs of relationships: women and biodiversity; women and water resources; and women and forest resources. The objective is to seek to interrogate the vulnerability of women in the gender-environment-livelihood nexus.

Women and Biodiversity

Nanda (nd: 34) has quoted an Indian saying that very adequately summarizes the gendered relationships with natural resources and particularly with respect to biodiversity, to the effect that:

> "When a girl is born, ... we say that the forest laughs and the birds cry, because her future activities include maintaining the forest and are not connected with logging in order to sow (so her work will not feed the birds). In the case of a boy, the opposite is said, that the forest sheds tears and the birds laugh, because men will partially log to cultivate when needed and, at the same time, the food they grow will also feed the birds. These metaphors reflect the difference in functions, but not a kind of superiority or inferiority"

According to the United Nations Environmental Programme (UNEP) (2002), the definition of biodiversity could be very broad, spanning the diversity between and among ecosystems and species and also within species. Worldwide, there are said to be an estimated four million biological species, out of which only 1.75

million(or 43.75 percent) have been described. Among the wide variety of environmental services that these diverse living organisms render are:

- the regulation of the hydrological cycle and climate,
- protection of coastal zones,
- regeneration and conservation of fertile soils,
- pollination, and
- breakdown of wastes. They are indeed the very basis of human well-being.

Within the context of this broad platform, the United Nations Environmental Programme (UNEP) (2004) has quoted Lilongula (1999) as presenting a holistic valuation of biodiversity by saying that "…..(it) is the very core of our existence within our communities. We cannot say how many dollars this is worth, because it is our culture and our survival. In this context, biodiversity is invaluable. … We value our surroundings (environment) as our identity; as who we are and our inheritance that is given to us. Our environment is many things: a classroom, a pharmacy and a supermarket". In other words, like a school, biodiversity teaches us and we learn from it about nature; it is a source of medication; and it meets our supply of diverse needs: food and energy, among others. Similarly, UNEP (2004) has quoted Vanniayakae (1999) as saying that: "Biodiversity to me is made up of the things and conditions that maintain the balance that we have lived with for centuries. It includes the animals, plants, rocks, rivers and spirits. The diversity of lifestyles and patterns of land use make biodiversity a vibrant and living thing for us".

The UNEP (2002) attempts to summarize the relevance of biodiversity to man's life and to living, generally, as follows:

> "Species diversity buffers ecosystems against the effects of human change, with biodiversity ensuring local and global food security, providing the generic basis for most food crops and increasing genetic resistance, obtained from wild varieties, to disease. ….. Human health also depends directly on biodiversity, given that some 75 per cent of the world's population relies for their health care on traditional medicines derived directly from natural resources. Traditional medicine systems, such as *Ayurveda* in India, are based on pure plant extracts. Biodiversity is particularly crucial for people living in poverty, who directly depend on its services for their survival and livelihoods. Many people, including those in indigenous communities, also draw cultural and spiritual values from it"

Although both men and women acquire traditional environmental knowledge and expertise from generations who have lived and interacted with nature,

such knowledge is not only gendered, it is also socially differentiated according to age, occupation, socio-economic status and even religion. With particular regard to gender, it has been established in the literature, that division of labour, property rights, decision-making processes and perceptions also shape such knowledge. Consequently, men and women eventually acquire different knowledge, expertise and experience base. Thus, while men may have a great deal of knowledge about the trees used as timber members for construction, women tend to be greater experts concerning fruits, medicinal plants, fodder and other non-timber forest products.

What this means is that, women's understanding of local biodiversity tends to be deeper, broader and richer; containing many unique insights into local species and ecosystems, gained from centuries of practical experience, which science has claimed to date as far back as the hunter-gatherer communities of the early Stone Age, when in fact, the knowledge of the natural environment determined the status and well-being of women. For instance, a study of biodiversity knowledge and expertise in Sierra Leone, showed that while women were able to name thirty-one (31) uses of trees found on fallow lands and in the forests, men could name only eight (8) (Domoto, 1994). Such deep knowledge is derived from and based on the fact that, for most rural women, biological diversity is the cornerstone of their work, their belief systems and their basic survival and livelihoods. Because of the symbiotic relationship between women and nature, they are, also, more directly affected by the shocks and stresses caused by men-dominated economic activities such as logging; to the extent that the ecosystem is disturbed and biodiversity is depleted or lost in the process; and more importantly, the livelihood assets and strategies of women are negatively affected.

One of women's specific livelihood strategies tied very closely to biodiversity is the collection of medicinal plants, roots and herbs, which are used by traditional medical practitioners for curing ailments, while also serving as fodder and fuel or even as manure and pesticide, and ultimately as a source of supplementary incomes. Chinweze and Abiola-Oloke (2009) have claimed that in the Niger Delta Region, at least twenty-two (22) plant species are used by the natives for medicine; with examples including *cinochona*species, *digitalis* species and *acacias,* among others. Furthermore, some plant species are also used as insecticides and repellents. The association between women and traditional medicine component is partly confirmed by Omobuwajo, Alade and Sowemimo's (2008) study of the knowledge and practices of herbs sellers in southwestern Nigeria (as also applicable to the Niger Delta Region)which revealed that the highly specialized trade was dominated by women, who supply mostly medicinal plants (Figure 5), small animals and animal parts.

Because of their closeness to nature and their consequent distinct indigenous knowledge system of biodiversity, they found that women acted as the essential linkage between traditional medicine practitioners (who process them into potions and concoctions), on the one hand, and the traditional health-care seeking populace, on the other. Women know the shelf-life of various biodiversity. They are in the best position to know the plants that are under pressure and are being over-exploited, and so should be conserved and protected from extinction. Women in rural communities, therefore, tend to be more disposed to encouraging and actively supporting conscious attempts to ensure sustainable use of these environmental resources. Consequently, they are more disposed to ensuring that their extractions are guided by the need to always leave something behind for another day, to both sustain their micro enterprises and the larger environment.

Medicinal plants market near Mathare, Nairobi, Kenya.

Source: C. Lambrechts/ UNEP

Figure 5: An array of medicinal plants and derived products displayed by a woman entrepreneur in a market near Math are, Nairobi, Kenya. Similar scenes are common in the traditional markets in the major cities in the Niger Delta Region of Nigeria.

Source: Google images/C. Lamrechts/UNEP

Indeed, comparative studies have confirmed that men's indigenous knowledge of biodiversity is actually declining, due to their preference for, and emphasis on formal education; and rural-urban migration in search of non-nature based occupations. Contrastingly, women are not only retaining their knowledge but are, in fact consolidating, refining, enhancing and improving it by sharing it with more and more people. Furthermore,

women are even acquiring additional knowledge of nature in those areas of natural resources that used to be the traditional and exclusive preserve of men, but which they have abandoned (Rocheleau, 1995), as they migrate from the rural areas to the major cities in the region, such as Port Harcourt, Warri and Benin City. In other words, women are successfully converting the perceived disadvantage of cultural discrimination against the formal education of women and the girl child and the chauvinistic exclusion from urban employment into an advantage of expanding and enriching their knowledge of biodiversity. However, this valuable indigenous knowledge is not optimally utilized largely because women are marginalized, sidelined, alienated and disconnected from the processes connected with the decisions on the use of land and common pool resources, particularly biodiversity. This discrimination cannot continue to be safely ignored, if the sustainability of the environment and natural resources of the region is to be pursued with any seriousness.

Furthermore, the livelihoods of women are endangered through the unmitigated and uncontrolled biodiversity loss, resulting from the activities of men and men-dominated operations.

Another major threat to the biodiversity base of women's livelihood is biopiracy. Biopiracy is the practice of the commercial development of the naturally occurring biological materials, by technologically advanced countries, without any or fair compensation to the people of the country in whose territory the materials originate from. Women are the victims of biopiracy because they are often the ones disposed of livelihoods by the pirated biodiversity.

It is instructive to note that many experts in the forestry sector believe that exploitation of women-dominated non-timber forest products is less ecologically destructive than men-dominated timber harvesting. In other words, women's activities provide a sounder basis for sustainable forest management (Arnold and Perez 1998). Recent research on a variety of NTFPs in Latin America found that in 75 per cent of the cases studied, over-exploitation of the natural resource base was the initial outcome of increased gendered commercialization (Hossain, 2008).In the specific context of the Niger Delta, Gabriel (nd: 8) has asserted that the region is characterized by such men-dominated activities as uncontrolled and illegal logging; indiscriminate, commercial fuel wood harvesting; bush burning, for game hunting; and felling of tree for furniture and other crafts, all of which aid deforestation.

To appreciate the implications of these operations for the livelihoods of women, we only need to note that the trees extracted or exploited by men co-habit the same ecosystem with such plants as the bush mango (*ogbono*) (*Irvingiagabonensis*), oil bean seeds, breadfruit (*ukwa*) and other fruits, which women traditionally harvest for livelihood, either for food or supplement household incomes, or

both. Therefore, when men extract the trees that they need, they deplete and or destroy the stock of those that women depend on, in the process. Consequently, Gabriel (nd: 8) argues that when these trees are selfishly felled by the men without planned replacement, on the one hand, and without regard for those that the women need, on the other, as is often the case, the women's environmentally sensitive livelihoods become very vulnerable and the women eventually become the victims. Women are inadvertently deprived of their economic resources and indeed, their livelihood assets.

In other words, these processes frustrate efforts at achieving the first millennium development goal (MDG1) 0f reducing endemic poverty and hunger, particularly among rural women, by threatening the sustenance of their present livelihoods. For instance, in recent times, most women can only gather medicinal plants along road sides and fences. This is because they only have access to the most marginal lands, where the resources are fewest and their quality, also poorest.

Women and Water Resources

The observation made below by Amnesty International, is an appropriate preamble to the discussion of the relationship between women's livelihoods and water resources in the Niger Delta Region.

> The Niger Delta is wetland, and the health of the environment and the lives of people are intertwined with the health of the water system. The food, water, and cultural identity of many local peoples are closely related to the delta ecosystem. The rivers and streams are used for drinking, bathing, fishing, harvesting, and fermenting cassava. The Niger Delta ecosystem, as Shell Petroleum Development Company Limited (SPDC) has noted, is "particularly sensitive to changes in water quality such as salinity or pollution…". In the light of this, one of the most disturbing findings of Amnesty International's research was that the water system – the rivers, streams and ponds – have, for decades, been the receiving bodies for oil spills and waste discharge, including waste water and dumped drilling waste (Amnesty International, 2009: 25).

The observation by Amnesty International shows vividly the truism that water is indeed as essential for all forms of life. It is indeed crucial for human socio-economic development, particularly among the rural poor communities. Water systems, including wetlands, coastal zones, surface waters and aquifers, provide a vast majority of environmental goods and services. These include drinking water, environmental health and food.

Because of its core significance, therefore, globally, the demand for water is growing very rapidly, in correspondence to rapid population growth. Consequently, in many countries, especially in the Third World, where there are copious, stressful and escalating deficits, the cost of developing new sources of safe water is becoming very high and even prohibitive. These negative trends are compounded by a worsening in the quality of available water supply sources, through their pollution with both chemical and organic substances from sources such as inadequate, improper or poor sewage disposal systems, solid waste disposal, industrial effluents, agricultural residues, floods and oil spills, drilling wastes, among others.

Apart from making drinking water scarce, these pollutions and contaminations also disrupt the ecological and environmental balance, as well as constituting a veritable hazard to the health of entire communities. Furthermore, as a result of these challenges, there is an escalation in the imbalance between the supply of, and demand for, water, especially in the rural areas, where the vast majority of the people live and where there are no options at all, or the choices are most limited.

Water deficits affect the poor and the most vulnerable segments of the society first and hardest. This is because impoverished families tend to depend mostly on common pool resources for their sustenance. These include such water bodies, like rivers, streams, lakes and ponds. The water stress of the poor in urban areas is partly compounded by the water needs of the wealthy and affluent as well as industries, which tend to draw very heavily on available sources for purposes that the poor may consider as wasteful and a luxury, such as the watering of lawns. Since the urban poor also have limited choices in the face of scarcity, and since the gender role of water collection is assigned to women, poor urban women also bear the burden to meeting the household water needs.

The frustrating paradox is that although it is a ubiquitous, and probably periodically, even a superfluous element that could cause(and has caused)the nuisance of flooding in most of the Niger Delta Region, access to safe, potable drinking water is grossly inadequate. According to the United Nations Environment Programme (UNEP) (2004: 61), water shortages in regions like the Niger Delta are also caused by the irreversible degradation of wetlands, flood plains and coastal ecosystem; deforestation of catchment areas; and the damming of rivers. As we will confirm later, more recently, the impact of climate change on water supply systems, through droughts and flooding, are becoming more and more evident, visible and worrisome.

Base line studies have estimated that only about 20 per cent of the people dwelling in the rural areas of the Niger Delta Region have access to potable water. The figures increase to only between 40 and 45 per cent for people

in the urban areas (NDES, 2000). The vast majority of the population, therefore, depends on unsafe supplies from rivers, streams, lakes, ponds, and shallow hand-dug wells. The high water table of the region has obvious implications for the vulnerability of these sources of water to contamination and pollution, on the one hand, and environmental health hazards, on the other.

Like in other environmental resources, women and men play very divergently distinctive roles regarding the use and management of water and water supply systems. In the Niger Delta Region, where large livestock raising and irrigation farming that culturally require the attention of men, are practically non-existent, the water needs of the rural household is the exclusive responsibility of women. Consequently, in almost all rural communities, women and girl children are responsible for fetching every litre of water for cooking, bathing, cleaning, maintaining family health and hygiene, and raising small livestock, like domestic hens and goats, among others. Together, these tasks consume an incredible amount of time and energy. For instance, the United Nations Development Programme (UNDP) (2009), has claimed that women in sub-Saharan Africa (SSA)spend 40 billion hours a year collecting water, which is equivalent to a year's worth of labor by the entire workforce in France!

In other words, the brunt of coping with water needs and deficits is usually borne by the women, because they are the ones that are culturally assigned the role of collecting, storing and managing water in the household. In the process of carrying out these roles, women acquire considerable, cumulative and valuable experience and knowledge base about local water resources, including their locations, quality, reliability, restrictions and acceptable storage methods.

However, as a result of this gender role, women are disproportionately affected by the negative fallouts of activities and operations that negatively impact the environment and affect water supply systems, such as floods, dam constructions, channelization, canalization and pollutions. In the Niger Delta, where oil spillages and consequent pollution of both surface and underground water sources are very common occurrences, greater burden is placed on women in trying to cope with such disasters and environmental shocks, stresses and reverses. A recent study of the women in Eastern Obolo Local Government Area of Akwa Ibom State shows that the pollution of their water supply sources was their most major environmental challenge (Okoro and Odebode, 2009:9). Similarly, Joab-Peterside (nd: 3) has concluded from his survey of women's livelihoods in Akwa Ibom, Bayelsa and Rivers States of the Niger Delta that women are the most affected by the pollution of the communal ponds and rivers that supply their drinking water (Figure 6).

For instance, Gabriel (nd) observed that in 1989, the inhabitants of Obio/Akpor and Bonny Local Government Areas

(LGAs) of Rivers State had a traumatic experience, when their rivers, wells, springs and all other sources of drinking water were polluted by an oil spillage. Similarly, in Ondo State, tidal incursions due to the soil erosion resulting from oil exploration hazards forced women in some fishing villages such as Apata, Awoye, Ojumote, among others, to paddle for at least twelve hours into other parts of Ondo State and even to neighbouring Edo State, in search of fresh drinking water. Also Ofiebor (1998) has been cited by Gabriel (nd: 6) as reporting that thirty-four communities in Delta State, including: Gbaramatu Clan, Okerenkoko, Kokodia, Opurosa, Korotie, Okolobobugbene, Benekrukru, Epemu, Obafa, Kunkunu, Asama and Igbogho, which source their drinking water from the creeks, were adversely impacted, when oil leakage from a 28-year-old trunk pipeline linking Jones Creek oil field, which occurred on Thursday, 26th March 1998, spilling some 20,000 barrels of crude oil into

Figure 6: A woman and some girls fetching water from a polluted pond. The alternative could be several kilometers away; meaning more time and energy and greater risks as in Figures 7 and 8.

Source: Google images: gulfofmexicooilspilblog.com

the creeks and mangrove swamps. Not only are their normal responsibilities increased by the consequences of such environmental shocks and stresses, the circumscription the rights of female-headed households (FHH) tend to put them at great disadvantage in terms of their recovery capability, the compensations they get and other relief efforts, including sharing of materials and general rehabilitation.

Furthermore, in rural areas, where water sources are located in unprotected, hidden and isolated places, women and girls are exposed to diverse dangers, particularly in an environment of pervading and deepening insecurity. These dangers include the possibilities of hostage taking, kidnapping, rape, on the one hand, and attacks by poisonous insects and reptiles, like snakes and scorpions; and contact with elements that can cause skin and sight disorders, on the other (Figures7 and 8).While local primary or even secondary data may not be available, it has been claimed that in Sudan, 82 percent of rapes occur when women and girl children are outside their villages, searching for fire wood, collecting water, or travelling to the market (AGC, 2009; 3). Furthermore, since women are in greater contact with poor-quality water, they face an equally higher degree of exposure to water-borne diseases and pollution than men. For instance, Gender and Water Alliance (GWA) (2003) claims that seventy per cent of the world's blind people are women, who have been infected directly or indirectly through their (mostly girl) children with trachoma, a blinding bacterial eye infection prevalent in communities with limited access to potable water.

Figure 7: A woman and a girl on a lonely path in search of drinking water, made scarce by the pollution of near-by sources (Figure 6).

Source: *Google images; notenoughgood.com*

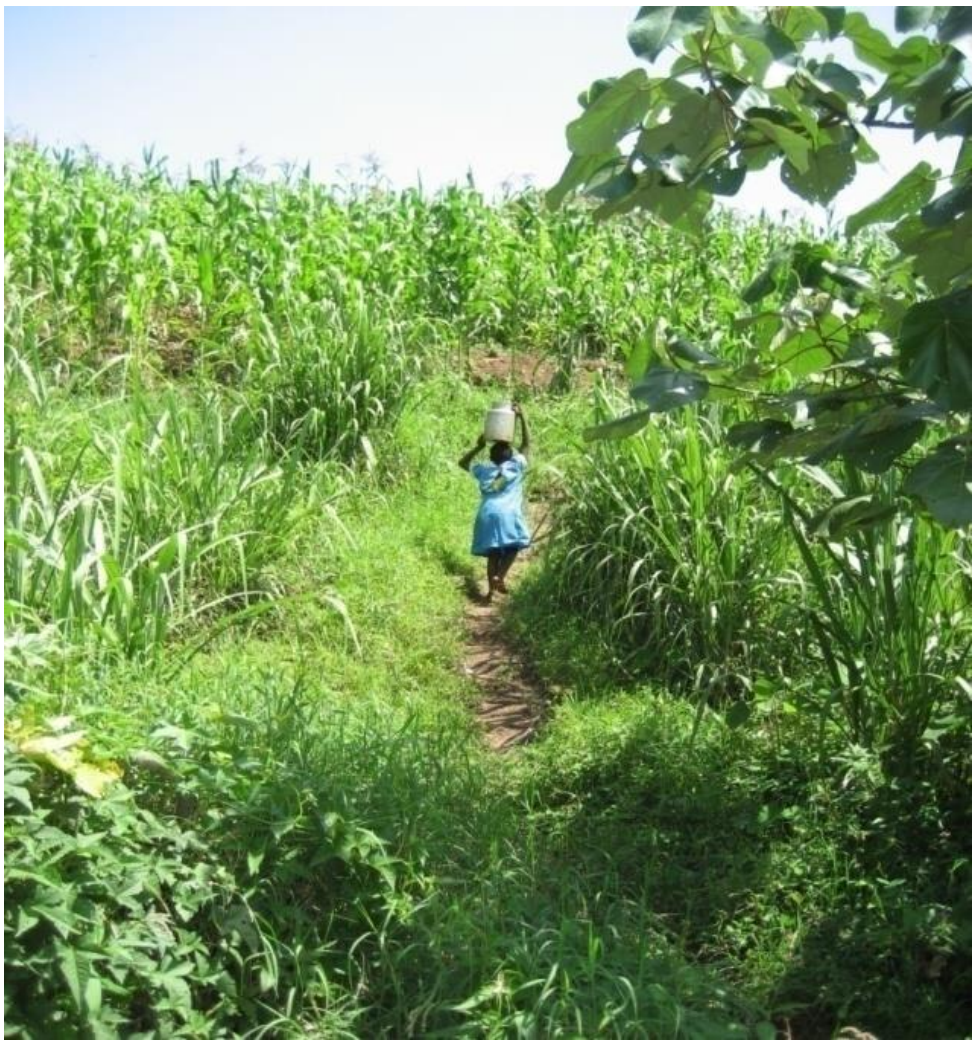

Figure 8: A lone little girl on a lonely path in search of drinking water, where nearby sources have been polluted (Figure 6)

Source: *Google images; humanrace.wordpress.com*

Although they may not all be present in a single location, Rosen and Vincent (1999: 6) have cited White, Bradley, and White (1972) as painting a vivid, albeit an exaggerated picture of the worst case scenario of the dangers to the health of the average poor rural African woman associated with the challenges of inadequate household water supplies, as follows:

An African housewife gets up in the morning and soon begins to fetch water. She walks through the thicketed bush to the water source. This is the habitat of tsetse flies and she is exposed to their unpleasant bites and the risk of sleeping sickness. She reaches the water source

> in a valley bottom and has to wait her turn. This is the habitat of disease-bearing mosquitoes and of a different tsetse fly more efficiently transmitting sleeping sickness. The stream contains snails transmitting *bilharzias is*, if it is sluggish, or breeds the vectors of *onchocerciasis*, if it is rapid, or may contain guinea worm larvae, if it is a mere muddy hole. She collects the water, which today bears a highly dilute load of human excreta and may contain typhoid bacilli or hepatitis virus. She returns, past the tsetse flies, to her home...She prepares the family's main meal. The scarcity of water discourages the washing of hands before the meal and makes washing-up after the last meal perfunctory. Some decayed food may be left on the utensils. Some un-boiled water is drunk by her thirsty family, who pick up the germs from it.

The presence of even one of these hazards should be enough to engender concern for the health of women and girl children that are exposed to them. Even when women are not directly and personally afflicted with water-borne diseases, or diseases contacted in the process of fetching water, their burdens are nonetheless increased in terms of caring for other members of the family and household (especially the girl children to whom their roles are delegated when it is not convenient to perform them directly) who may be affected.

Women and Forest Resources

We re-emphasize that a plethora of studies have shown that women are the primary users of forests, directly or indirectly through their involvement in food production for subsistence, herbs gathering or planting, for medicinal herbs, fuel-wood collection, and small-scale forest industries producing domestic products. WWF-UK (2012) summarises the relationship, in part, as follows: "Women are responsible for collecting forest products such as fuel wood, fodder for livestock, other non-timber forest products (NTFPs) and raw materials to produce natural medicine. These help to meet subsistence requirements and increase family income".Nanda (nd: 24) and Merchant (1980) have presented the inalienable and strong bond between women and forests bydrawing the analogy that the forest is the equivalent of the woman's mother's home, where (like a young bride), she goes to augment her household's supplies, when the supply runs low or when the need arises. Women go to the forest to replenish and restock, when their supplies are low or when they run out of supply.

As has become evident, both in the literature and in the studies of the rural areas of the Niger Delta Region, as a result of traditional and cultural gender division of labour, women are almost entirely dependent on the forest to meet

their daily needs of household food, water, fodder, fuels and other minor forest produce. Therefore, as a livelihood strategy and diversifying their portfolio, it is primarily the lot of women to gather a wide range of non-timber-forest-products (NFTPs), both for subsistence and as a source of supplementary income for the household. Women's role in forestry and the forest economy may, therefore, be considered from various perspectives. We shall look at three, namely; biomass fuels, supplementary income and employment.

- ***Biomass as Fuel and Household Energy***

  Studies have shown that due to the pervading and deepening energy poverty, on the average, 74.4 per cent of all households in the Niger Delta Region depend on fuel wood as the major source of energy. Another 1.9 per cent depends on charcoal (CPED, 2003: 173,174, and Omuta, 2011: 47). Consequently, the forest has become the warehouse from which the gathering of biomass, otherwise called head-loading of fuel wood is done by the women folk (Figure 9).

Figure 9: A woman and her daughter returning from a long and energy-sapping search for fuel wood.
Source: Google images; bye foundation.org

Wokocha's (2010) survey of rural communities of Rivers State provides specific primary evidence of the poverty-environment linkages in the Niger Delta Region. Table 2 summarizes the responses to the question concerning which of the biomass sources of fuel is considered most affordable and readily available to rural households. The Table shows that as a result of energy poverty, rural communities in the Rivers State of the Niger Delta, depend rather overwhelmingly on the direct combustion of biomass fuels such as: fire wood, crop residues and cow dung for cooking, space heating and lighting.

More specifically, the details show that on the whole, 67 per cent of the surveyed respondents claim that they resort to biomass-based energy sources because that is what they could afford, while 74 per cent reject modern fuels such as oil and gas derivatives as their sources of household energy, because they are unaffordable. In terms of the rating of their preferred biomass fuel, saw dust was first, followed by dried grass, wood residue/chippings and cow dung tied for the third place and wood fuel came fourth. The least preferred was charcoal. The direct income poverty-energy type correlation is reflected in the fact that of all the types of biomass-related fuels available to the surveyed communities, charcoal is the most expensive; hence it is the least preferred.

Table 2: Relative Affordability and Availability of Various Sources of Biomass Fuels

Cheap and readily available biomass fuel	**Yes**	**No**	**Yes %**	**No %**	**TOTAL**
Saw dust	130	20	87	13	100
Fire wood	98	52	65	35	100
Charcoal	54	96	36	64	100
Dried grass	124	26	83	17	100
Wood residues/chippings	100	50	67	33	100
Cow dung	10	140	67	33	100
Prefer biomass to oil and gas	39	111	26	74	100
Can only afford biomass fuel	101	49	67	33	100

Source: Culled from Wokocha, 2010.

Obviously, therefore, and based on the established premise that they are the providers of household energy, the first victims of any environmental degradation that affects biomass supply are the women, among the poor. A fuel wood crisis resulting from deforestation, for example, forces poor rural women to travel for miles in search of wood for cooking and heating. This involves the expenditure of energy and time, which the women could have channelled into more economically remunerative activity, for income

earning. This burden on women in turn has an impact on their girl children. When the mothers' time is spent on fetching fuel wood and drinking water, the girl children are kept at home and prevented from attending schools. When the women get older and can no longer directly meet the household need for fuel wood by themselves, they send their girl children. Furthermore, when they are left at home, girl children are charged with responsibility of looking after the younger children, sweeping the house and doing other household chores. These affect their chances of educational success, which ultimately translate into a fundamental disadvantage in a competitive society and the choices that they can make in life. As will become clearer later, from the point of view of environmental health, women are also the immediate and direct victims of the smoke that fills the houses of those who cannot afford clean fuels like natural gas and electricity.

When the rural Niger Delta woman complains about the lack of firewood, or of water pollution due to deforestation or oil extraction, or mangrove uprooting by the shrimp industry, such complaints do not arise because of a biologically based empathy of women with nature. Rather, they arise from the fact that women depend more on non-market access to environmental products and services because of their lack of access to private property resources, particularly, land, and because of the gender division of labour which makes firewood or water women's work (Martinez-Alier, 2011). Thus, class (as between the poor and rich) and occupational role (such as between men logging the trees for timber and women collecting the dry branches for fuel), rather than the biological aspect of gender seem to determine the historical specificity of women's interaction with forests, including public lands.

Again, we re-emphasize that both the literature and local evidence confirm that in addition to firewood, the poor women collect what are called minor forest products (MFPs) or non-timber forest products (NTFPs), such as fodder and grasses; raw materials like bamboo, canes and *Bhabbar grass* for artisan-based activities; leaves, gums, waxes, dyes and resins; and many forms of food, including nuts, wild fruits, honey, and game (Saxena, 2011: 7).

Much of the misery of forest dwellers, especially poor rural women, can be attributed to deforestation and commercial plantations which have depleted and diminished the resource base from which these livelihood assets are derived. This misery is further compounded by the pervading and widespread evidence that show that women's access to forests for purposes of meeting their basic subsistence needs has deteriorated overtime, largely because they are excluded from decisions concerning the management of forest-based environmental resources.

A particularly interesting and instructive gendered observation has been made with respect to the historical perspective on fire wood business in

Cameroun; where it has been claimed that the collection and sale of the biomass was initially dominated by women, assisted by their adolescent children. However, the recent involvement of men in the collection of fire wood has turned out to be to be a huge disaster, and to the detriment of the women in the business, on the one hand, and the environmental resource base, on the other. This is so because while the women collect the fallen branches and otherwise naturally dry material, the involvement of the men has precipitated a significant felling of individual live and wet trees, which are left to dry before being split and traded (Sunderland and Ndoye, 2004). Thus, while women activities ensure environmental sustainability though natural regeneration by keeping the live trees alive and standing, the men accelerate its destruction through unsustainable deforestation, without provision for reforestation.

- ***Supplementary Income from Non-Timber Forest Products (NTFPs)***
  Flowing from, and related to the last section is the core and very strategic importance of non-timber forest products (NTFPs) to the welfare of poor rural women. Recent studies in Mexico and Bolivia have shown that NTFPs have the potential and capacity to contribute significantly to poverty reduction by providing 'safety nets', which reduce the vulnerability of poor communities to risks that are associated with such shocks and stresses as climate change, crop failure or even when illness strikes. They can also contribute to poverty reduction by ***supplementing income*** from the more visibly important farm and off-farm income generating activities.

In summarizing the major findings of the gender dimensions of ***Forest Products, Livelihoods and Conservation: Case Studies of Non-Timber Forest Product Systems in Africa,*** Sunderland and Ndoye (2004), among several other particularly instructive findings, highlighted the increasingly important role of fruit production in rural livelihoods, particularly for women. They observed that although some industries such as wood-carving, rattan furniture production and sport hunting of large games like elephants, are entirely male-dominated, women play a dominant role in the marketing and final sale of many products.Resource-poor people, and particularly women, find NTFPs or collecting and processing activities very attractive because of the:

- usually low technical, skill and financial entry requirements,
- free availability of common pool resource base, and
- instant cash they generate in times of critical need (Hossain, 2008: 5) (Figures 10 and 11).

For instance, in Ghana, Blay (2004) observed that 85 per cent of the chewing sticks trade business is coordinated by women, who have organized themselves into a

hierarchical trading system. Furthermore, Sunderland and Ndoye (2004) observed that the harvest and sale of fruits and nuts also seems to be predominantly female economic activities, especially with respect to *Garcinia kola, Dacryodesedulis* and shea (*Vilellariaparadoxa*), with women completely dominating the trade in the latter.

Figure10: An array of semi-processed non-timber forest products displayed for sale in the market; a veritable source of supplementary household income for the poor. This is a common and familiar sight in all traditional markets in the Niger Delta Region.

Source: Google images; fao.org/eoearth.org

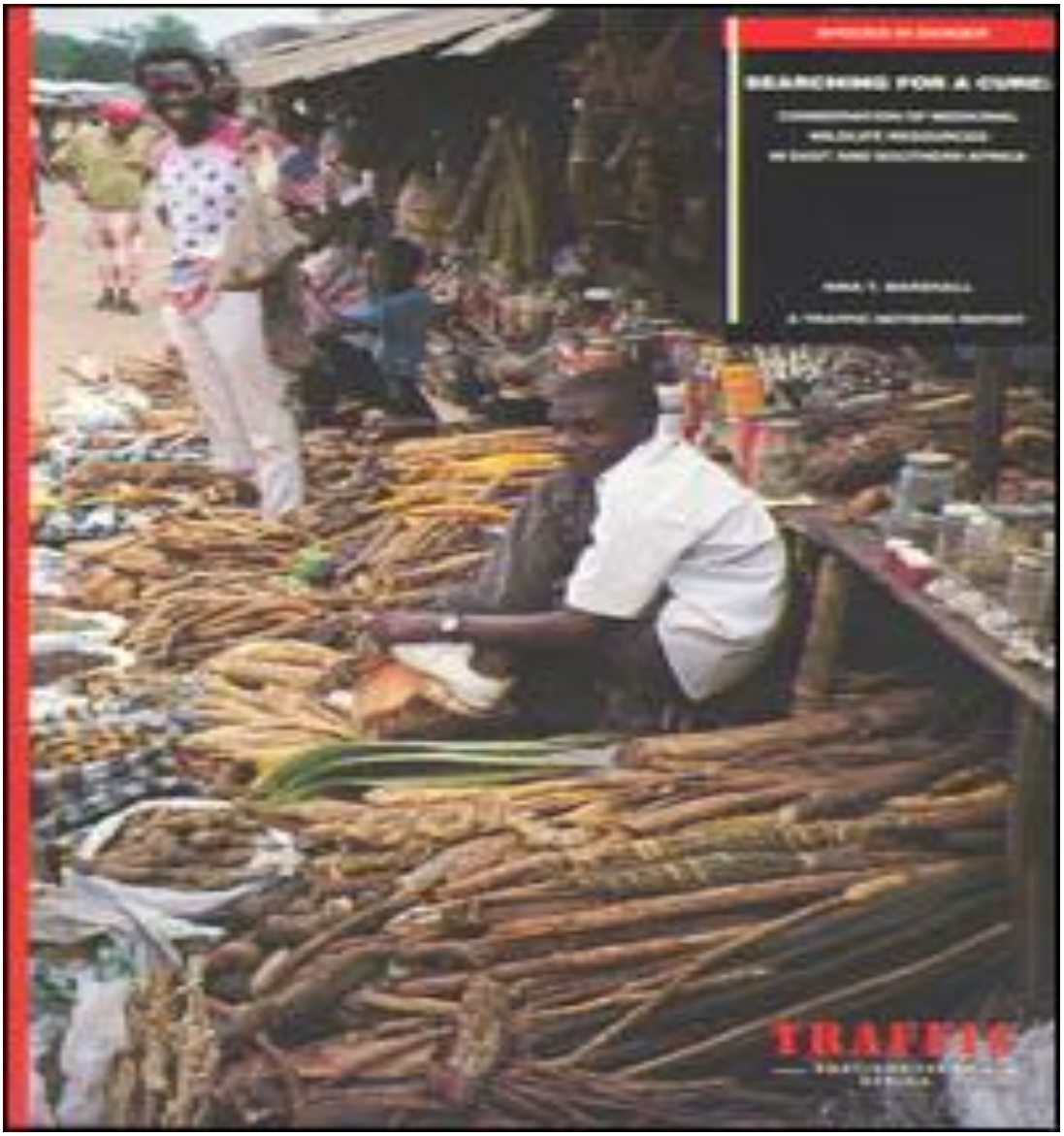

Figure 11: An array of non-timber forest products displayed for sale in the market; a veritable source of supplementary household income.

Source: Google images; fao.org/eoearth.org

We can also draw valuable and relevant lessons from other specific studies in some African countries on the gendered dimensions of environment-livelihood linkages, with particular reference to non-timber forest products and livelihoods of rural women. For instance, Weinberg (2004) observed that over 9,000 rural women in Namibia, Botswana and South Africa rely on the harvesting of wild *Harpagophyum spp*. (devil's claw), a Kalahari plant used for

treating rheumatism and arthritis, as their only source of income. In the Republic of Benin, Schreckenberg (2004) found that the kernels of shea butter (*Vitellariaparadoxa C.F. Gaertna*), a staple component of the local diet, was the most significant contributor to the incomes and livelihoods of rural women. Cocks and Dold (2004) also found that in South Africa, poverty-strikenperi-urban women collect the bark of a rare forest tree, *Cassipoureaflanaganii*, which they sell in local and national markets, as a skin lightening cosmetic, to supplement their livelihood assets and household incomes. These studies confirm that globally, in all poor, particularly rural forest-based communities, like the majority of those in the Niger Delta Region, forests and non-timber forest resources are a major source of sustenance for women.

Table 3summarizes the contribution of various forest-based resources to the income poor households in the Niger Delta.

Table 3: Relative Contribution of Major Sources of Income to Total Rural Household Income in the Niger Delta Region

Sources of Income	**Income Quintiles**					
	Lowest 20%	**21-40%**	**41-60%**	**61-80%**	**Top 20%**	**All Households**
Wild fruits/nuts	21.2	24.0	14.4	9.1	4.9	13.4
Rattan	21.1	21.8	9.7	16.9	17.0	10.6
Fire wood	24.9	24.3	33.4	24.5	19.4	18.2
Farming	20.0	17.8	28.5	19.9	21.5	30.5
Others	12.8	12.1	14.0	29.6	37.3	27.3
Total income (%)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Income from forest products (%)	**67.2**	**63.6**	**57.1**	**50.5**	**41.3**	**47.2**

Source: Culled from Inoni, 2009 by Omuta, 2011.

The survey shows that, on the average, forest resources account for 47.2 per cent of all the incomes of the rural poor in the Niger Delta Region. This result corroborates the finding of other studies where common pool resources (CPRs) were observed to contribute a substantial part of the income of the rural poor (Jodha, 1995; Cavendish, 1999; Kerapeletswe and Lovett, 2001). However, among the various income brackets of the poor, these resources account for 67.2 per cent of the incomes of the poorest first quintile (20 per cent),

compared to 63.6 per cent of the second quintile (21-40 per cent), 57 per cent of the third quintile (41-60 per cent), 57.1 per cent of the forth quintile (61-80 per cent) and 41 per cent of the top quintile (81-100 per cent). There is, therefore, an evident inverse relationship between the proportion of household income that comes from forest resources, on the one hand, and the total household incomes and level of poverty, on the other. It is only the richest 20 per cent of the poor rural communities in the Niger Delta Region that draws less than 50 per cent of their household incomes from the forest. Put the other way, there is a positive association between poverty and dependence on NTFPs, such that the poorest households depend most on environmental resources for their incomes and *vice versa*.

Furthermore, the Table confirms the conclusion that often, institutionally prevented from owning land, millions of rural women in the Niger Delta Region, as it is in most developing countries, tend depend on products from natural areas, particularly such non-timber forest products as fruits, nuts, natural oils, rattan and plant fibres, as some of the limited sources of supplementary cash income. In fact the Table shows that for the poorest sixty per cent of rural dwellers, the collection and sale of wild fruits and nuts comes next to fire wood. Thus, while across the region 13.4 per cent of the people get their supplementary incomes from wild fruits and nuts, the figures are 21.2 percent, 24.0 per cent and 14.4 per cent, respectively for the first, second and third quintiles, respectively. In addition, and as Marshall, Schreckenberg and Newton (2006: 6) have also claimed, forest products also provide materials for handicrafts, which are sold to generate income

Finally, among the five forest resources investigated in the study, Table 3 shows that, fire wood collection stands out prominently. For instance, among the poorest first, second and third quintiles, fuel wood is the first and most major contributor to household incomes, accounting for 24.9 per cent, 24.3 per cent and 33.4 per cent, respectively. For the forth quintile it came second (24.5 per cent) and occupies the third position (19.4 per cent). Again, we find that, as with all forest resources, the contribution that income from biomass fuel makes to total household income is inversely related to the income bracket of the household. Accordingly, the lower the income bracket, the more significant the share that comes from fuel wood (forest) sources and *vice versa.*

- ***Employment***
  When the efforts that women devote to gathering and collecting biomass and other non-timber forest products are converted into man/days, the result is an indication of how much employment is provided by environmental resources to the livelihood strategies of women. It is appropriate to recall that the United Nations Development Programme (UNDP) (2009) has claimed that women in sub-Saharan Africa spend over 40 billion hours a year

collecting water, which is equivalent to a year's worth of labor by the entire workforce in France! In this context, studies have shown that environmental resources are a major source of employment for women, who, by gender division of work are allocated the roles and responsibilities that compel them to depend on them for livelihood (Table 4).

Table 4: Extent of Household Dependence on Forest Resources by Income Groups

Parameter	Income Quintiles					All Households
	Lowest 20%	21-40%	41-60%	61-80%	Top 20%	
Fuel supply (%)	87.3	84.0	76.7	71.6	66.0	78.2
Employment (man days)	**178.6**	**163.1**	**137.0**	**123.6**	**96.2**	**139.8**
Income from forest resources as % of total household Income	67.2	63.6	57.1	50.5	41.3	47.2

Source: Culled from Inoni, 2009 by Omuta, 2011.

For instance, Table 4shows that Inoni's (2009) study of some rural households in the Delta State of the Niger Delta Region revealed that on the average, women spend 139.8 man days of their total employment time per annum on activities from which they could earn supplementary income from forest resources. However, the figure for women in the lowest quintile (the poorest 20 per cent) is higher at 178.6 man/days. The corresponding figures for the second and third quintiles (21-40 per cent and 41-60 per cent, respectively, of the poorest rural households), were 163.1 man/days and 137.0 man/days. These figures confirm that there is a direct association between household poverty levels and dependence on forest resources for employment, by women. Thus, the poorest and most vulnerable women, who invariably dwell in remote rural and forest-based communities depend most on the forest and its natural resources as source of employment and *vice versa*. The gathering of fuel wood, fodder and non-timber-forest-products is, therefore, not only an important subsistence and economic activity, but also a major employment for poor rural women.

Inoni's (2009) findings, therefore, corroborate other studies that have established that poor households with little income-earning alternatives tend to spend more time and effort exploiting forest resources both for fuel and income;

thereby creating or aggravating environmental stress (Lopez, 1998; Durraiappah, 1998; Baland, *et al*, 2004).

Omorodion (2011) studied Ogulagha (Delta State) and Gelegele (Edo State), to determine the impact of oil and gas activities on the environment and aspects of the livelihoods of rural communities in the Niger Delta Region. With respect to the exploitation of aquatic animals and fishes, Omorodion's (2011) study of some fifty (50) items of NFTPs confirmed the gender disparity, on the one hand, and the vulnerability of women, on the other, as a result of their disproportionate dependence on environmental resources. The findings are shown in Table 5.

Table 5: Depletion of Aquatic Animals and Fishes

S/N	Resources: aquatic animals and fishes		Exploiters by gender and age grade	Past population	Present population
	Common names	Biological names			
1	*Eba*or governor fish	*Gymnarchus*	Men, women, youths	Abundant	Few
2	*Akpa*	*Gnathmenus*	Men, women, youths	Abundant	Few
3	*Elei*	*Alestes*	Men, women, youths	Abundant	Few
4	*Opuru*	Crayfish		Abundant	Few
5	*Oloma*	Cat fish		Abundant	Few
6	*Idah*	Shining nose	Men, women	Abundant	Scarce
7	*Oma*	Electric fish	Women	Abundant	Few
8	*Utu/utoi*	Crab	Women	Abundant	Abundant
9	Red snapper		Men, women, youths	Abundant	Scarce
10	Shrimps			Abundant	Few
11	*Pomu*	Tilapia specie	Men, women, youths	Abundant	Few
12	*Iyoro*	Mud fish	Men, women	Abundant	Few
13	Tilapia		Men, women	Abundant	Few
14	*Osi*	Snail	Women, children	Abundant	Few
15	*Odia*		Women	Abundant	Few
16	*Kele*		Men, women, youths	Abundant	Few
17	*Ogida*		Men, women, youths	Abundant	Extinct
18	*Ekerikeru*		Women	Abundant	Scarce
19	*Ukuli*		Women	Abundant	Few
20	*Isako*	Dog fish	Women	Abundant	Few
21	*Ologholo*		Women	Abundant	Few
22	*Tabala*	Tilapia specie	Men, women	Abundant	Few
23	Tome/wicked fish		Women	Abundant	Abundant
24	*Odobu*		Men, women	Abundant	Few
25	*Elemeti*		Women	Abundant	Few
26	*Ifiafia*		Women	Abundant	Few

27	*Okirimokpoki /atan*		Women	Abundant	Scarce
28	*Aparon*			Abundant	Abundant
29	*Itoko*		Men, women, youths	Abundant	Few
30	*Ikolokolo*	Men, women, children		Abundant	Few
31	*Ikpiri*		Women	Abundant	Few
32	*Ogobaya*		Men, women, youths	Abundant	Few
33	*Ikalakpala*	Smaller tilapia	Men, women, youths	Abundant	Few
34	*Boya*		Men, women, youths	Abundant	Few
35	*Idoghumorgordi*		Men, women, youths	Abundant	Few
36	*Ikpiti / Osekai*		Men, women	Abundant	Few
37	*Izelezele*		Men women, youths	Abundant	Abundant
38	*Ekewu*		Men	Abundant	Few
39	*Agbadara*			Abundant	Abundant
40	*Ugulo / kele*		Men, women	Abundant	Scarce
41	*Izimu*		Men, women	Abundant	Few
42	*Agbaro*		Women	Abundant	Few
43	*Eben*		Men, women, youths	Abundant	Scarce
44	*Obuhi / big oloma*	*Crabs: Callinectsamnicola*	Women	Abundant	Few
45	*Epele*	*Periwinkles (Typanostomusfuscatus)*	Women	Abundant	Scarce
46	*Omogode*	*Aeroplane fish*	Women, youths	Abundant	Abundant
47	*Torio*		Men, women, youths	Abundant	Few
48	*Snails*		Women	Abundant	Abundant
49	*Agungu*	Reptile	Men, women, youths	Abundant	Extinct
50	*Igere*	Crocodile	Men, youths	Abundant	Scarce

Source: Omorodion (2011: 501, 502)

Table 5 shows that with the exception of seven items (that are still abundant), all the livelihood items studied have been depleted; with two classified as 'extinct', eight are classified as 'scarce', and the point of view, the Table shows that with the exception of two items (38 and 50) which are exploited either exclusively by men or by men and youths, women are involved in the exploitation of all. The implication is that the depletion of each of the items, except the two identified above, affects the livelihood of women. Probably more importantly still is the fact that fifteen of the forty-five items, whose exploitation is classified by gender and age grade, are exploited exclusively by women. The implication is that the depletion of 33.3 per cent of the listed items affects the livelihoods of only women, compared to 4.4per cent for men. Furthermore, Men and women bear the burden of the depletion of seven items; while men, women and youths bear the burden of the depletion of fifteen items. On the whole of the three classes of people who depend on the listed items, while the youths are not exclusively affected as a group, women bear at eight times the burden that the men, in terms of the

comparative number of livelihood items that are affected by the depletion of environmental resources.

Omorodion (2011: 503) captures the burden of the average Niger Delta woman represented by Table 5 by reproducing a field testimony as follows:

> This *(exploiting the items in Table 5)* is what our mothers brought us up with, sustained and trained us on, and this is what we depend on to also bring up our children. But the companies have destroyed or distracted these aquatic animals from our waters and forests; now making us poor, seen as lazy, toiling all day with little or no catch. How do we bring up our children?

According to Omorodion (2011), in the face of these stark realities, the women bemoan their fate and the uncertain future of their children and children's children, as the aquatic animals; traditionally the primary source of their meals and revenue, indeed their livelihood continue to be depleted by oil pollution. Having been robbed of their economic base and strength, the daughters of the region complain that they are no longer considered a relevant part of the community. The anger of the women is that while the men continue to dominate all affairs, they claim that "whereas we sustained these men before oil brought all this trouble".

Flowing from these findings, therefore, is the fact that when forest resources are depleted or destroyed, women's contribution to the welfare and upkeep of the household is correspondingly depleted, diminished or even completely destroyed.

9. CLIMATE CHANGE, THE ENVIRONMENT AND LIVELIHOODS

One conclusion that can be implied drawn from the gender-environment-livelihoods nexus is that livelihoods can be shaped by the changing natural environment. One factor that has recently proved to be a major, if not indeed, the most major determinant of the ability and capability of the environment to deliver sustainable livelihoods to the poor and vulnerable people that depend on it for their survival, is climate change (CC). The Inter-Governmental Panel of Climate Change (IPCC) (2007)has defined climate change as referring to a change in the state of the climate which can be identified by changes in the mean and/or the variability of its properties; particularly when such a change persists for an extended period, typically for decades or longer. Put differently, it refers to any change(s) in climate over time, whether due to natural variability or as a result of human activity.

Climate Change in the Niger Delta Region

The impression is generally created that climate change is caused by heavy industries and industrialized countries.

Therefore, given its level of industrialization and number of automobiles, The Friends of the Earth International (FoEI) has argued that Nigeria is not a major direct contributor to the emission of green house gases (GHGs) that are associated with industrialized countries, and which have been implicated in climate change. Nevertheless, Nigeria is a major producer and supplier of gas and oil to the industrialized countries of North America and Europe; which are perceived to be the major emitters of these polluting and climate change agents (Igbuzor, 2010: 141). Since the combustion of oil and gas releases green house gases, and since green house gases are major contributors to climate change, and since the oil and gas exported by Nigeria come from the Niger Delta Region, it follows that syllogistically, the area is an indirect major contributor to global warming and climate change.

However, even in a more direct way, through its double-digit gas flare stacks and other, even if few, industrial activities, the Niger Delta Region have been implicated in global warming and climate change. This how ICF International (2006: 17) puts it: Nigeria flares the gas that is generated in association with crude oil production. Currently, gas flaring amounts to about 18.9 billion cubic meters (BCM) per annum, which translates to greenhouse gas emissions of 45 million tonnes CO2 equivalent. This level makes Nigeria one of the top countries in volume of gas flared worldwide.More specifically, it must be noted that the region hosts multiple green house gas-emitting refineries, petrochemical and fertilizer companies, located at Port Harcourt and Warri. In terms of the details, Awosika (1995) claims that a total of 125.5 million cubic meters of gas was produced in the Niger Delta Region between 1970 and 1986. Out of this volume, an overwhelming 102.3 million cubic meters (or 81.7 per cent) was flared! Another estimate claims that Nigeria produced 5.7 trillion cubic feet (*tcf*) of associated gas between 1958 and 2000, out of which about 5.0 *tcf* (or an astonishing 88 per cent) was flared! (Iyayi, 2007). Indeed Nigeria is claimed to rank as number one in the world in terms of the volume of gas flared relative to the total volume of oil and gas produced, accounting for 13 per cent of all the gas flared in the world every year! (Iyayi, 2010: 87 and Bassey, 2007: 53). Indeed, the World Bank's 2000 annual report noted that through gas flaring, Nigeria contributes more green house gas emissions than the whole of the rest of sub-Saharan Africa (SSA)combined (Unabia, 2010: 12).

In presenting the impact of gas flaring on the climate of the Niger Delta Region, Agboola and Olurin (2003) claim that about 45.8 billion kilowatts of heat is discharged into the atmosphere of the area from gas flaring. This puts the daily rate of flaring at 1.8 billion cubic feet. Similarly, Anthony (2003) has claimed that Nigeria releases 35 million tons of carbon dioxide (CO2) and 12 million tons of methane (CH4) (both, green house gases) into the atmosphere annually, through gas flaring. While global data are not

available to make a guided and informed comparative judgment, these figures cannot be ignored in the discourse of climate change and its effects on the environment and livelihoods of the region. Suffice it to say that these releases massively compromise climatic elements and properties, and impact negatively on the environment. These are in addition to the well-documented negative health implications such as bronchitis, leukemia, asthma, cancers and various skin disorders and their obvious implications for the life expectancy in the Niger Delta Region.

The linkages between gender and climate change will be better appreciated when it is realized that the phenomenon is not just an environmental, scientific or technological concern, but that it hinges on critical social issues that have very significant gender-specific realities, particularly the livelihoods of poor rural women (Olawoye, Okoye and Eleri, 2010: 6). In other words, when factored into the analyses of climate change, the gender analysis approach promotes a deeper understanding of how the identities of women and men determine different vulnerabilities and capacities to deal with the negative externalities of climate change. According to Bridge (2008), while there is an avalanche of literature on gender and the environment, gender and energy, gender and water, gender and conflict and gender and disasters, there are few specific references to climate change. Consequently and apparently in order to close this information gap, the United Nations Interactive Expert Panel of the 52nd Session on the Status of Women (2008) identified gendered issues like energy, water and food security as among the critical areas of impact by climate change.

Gendered Effects of Climate Change

A number of scenarios build up to the linkages between gender and climate change, within the context of the gender-environment-livelihood nexus. First, almost all stakeholders now agree that the negative effects of climate change are likely to hit the poorest and most marginalized segments of the people in the poorest countries first and hardest, because of their limited livelihoods choices. It is also generally accepted in the literature, that women constitute the majority of the world's poor, and consequently, they are often more dependent on natural and environmental resources. Furthermore, in developing countries, particularly in the rural areas, gender roles and division of work reserve the usually unvalued, undervalued and unremunerated roles and responsibilities of providing energy, water and food for women. Rural women, being poor, invariably depend on natural and environmental resources to meet the climate-dependent and climate-sensitive energy, water and food needs of their households. This is how Gaye (2009; 3) interprets and links the scenarios: women's traditional roles as the primary users and managers of natural resources, primary care-givers, and labourers engaged in unpaid labour mean that they are involved in, and dependent on, livelihoods and resources

that are put most at risk by climate change.

Consequently, when climate change affects these natural and environmental resources, it is the women, whose livelihoods are highly dependent on them, that are most vulnerable and, therefore, not only the first, but the ones most disproportionately negatively affected(UNDP, 2011).And this has been confirmed in developing countries, for which the following statistics have been reported. That:

- 70per cent of world's poor, who are far more vulnerable to environmental damage are women,
- 85 per cent of people who suffer from climate-induced disasters are women, while
- 75 per cent of environmental refugees are also women (Abduraheem, nd: 9).

Even where there is the lack of hard and local primary empirical evidence, it is commonly accepted that climate change exacerbates existing inequalities in the key dimensions that are not only the building blocks of livelihoods, but are also crucial to the strategies for coping with change, including for example:

- wealth;
- access to, and understanding of, appropriate technologies;
- education;
- access to information; and
- access to resources.

More importantly, women are most vulnerable in all these areas, due largely to the entrenched gendered feminization of all dimensions of poverty.

This is how the Least Developed Countries Expert Group (LEG) (2002) puts it: "Climate change will have different impacts on men and women, and in most cases, the adverse effects of climate change disproportionately affect women. For example, with increasing drought, it is women who have to walk longer distances to collect water". Also, Olawoye, Okoye and Eleri (2010: 7), have quoted the Chairperson of Friends of the Environment (FOTE) as concluding that:

> "women's livelihoods are more dependent upon natural resources which are threatened by climate change. When weather patterns are erratic, women spend more time on each of these tasks (namely: providing energy, water and food, among others), which then means less time spent on education, family and health. Girls are often taken out of school, particularly to help with the additional burden the climate crisis has placed on the mother, especially fetching fuel wood and water".

Similarly, Olawoye, Okoye and Eleri (2010: 9) have cited the Director of Community Conservation and Development Initiatives (CCDI) as emphasizing that women are the most vulnerable group to the impacts of climate change for the following among other reasons:

- women are largely responsible for managing household food, water and energy, and ensuring their security;
- these and all the other responsibilities entrusted to women are dependent on, and are sensitive to, the environment and climate change;
- women are handicapped by institutionalized restriction of access to the resources and information needed to meet their responsibilities;
- women have limited decision-making capacity, as well as the capacity to fight for their right sand or defend them, when infringed upon.

Turner and Brownhill (2006) have presented an example of an instance in which women of the Niger Delta were victimized for attempting to express their frustration with respect to the damage being done by perceived contributors to climate change in the region as follows:

> In 1999, Nigerian women headed a world movement to stop flaring natural gas. In Nigeria, a transnational oil company was burning most of the natural gas to cut maintenance costs and to avoid involvement with other industries; the amount of gas burnt in the country was more than in any other part of the world and emitted more greenhouse gases into the atmosphere than the whole sub-Saharan region. In 1999, the women of the Niger Delta organized simultaneous protests in Nigeria and the United Kingdom that resulted in the company's London headquarters being closed, and the temporary closing of the wells; as the protests continued, the company turned to military control and in a confrontation 200 people was killed and many women raped. On 11 January 1999, hundreds of women members of the Niger Delta Women's Organization for Justice, indignant about the rapes and assassinations, organized a protest, as well as several political awareness workshops for women. Finally, in January 2006, due to social pressure, the Nigerian courts cancelled the gas company's license and ordered that a stop be put to flaring natural gas in petroleum wells in the western zone of the Niger Delta.

This case clearly confirms the fact that because women perceive themselves as the victims of environmental stresses and shocks, even with their limited levels of aware and empowerment, they are prepared to confront all factors and operators that contribute to climate change and aggravate the collateral stresses on, and shocks to, their livelihood assets and strategies.

Climate change not only increases the normal workload and burden of the existing gender roles of women, it also transfers what used to be the cultural and traditional roles and responsibilities of men to women. When climate change results in prolonged droughts, crop failure or persisting floods, and associated loss of men's livelihood assets, more and more men tend to be displaced from rural areas to the urban centres, with the result that men's normal domestic responsibilities revert to the women. In other words, women in Nigeria, in general, and the Niger Delta, in particular, are the most vulnerable to the economic challenges brought about by climate change. For instance, in many impoverished rural areas, men migrate to cities (such as Benin City, Warri, Port Harcourt, Calabar and other state capitals in the region)in search of work, while women remain in the highly traumatized and environmentally degraded countryside, where they provide as much as 80 percent of the agriculturallabour (Boserup, 2007: 7).

According to Adisa and Okunade (2005), hitherto, men were doing the back-breaking farming operations such as bush clearing on the farms, bush burning and mound making, staking and tilling, but as a result of climate change-instigated rural-urban drift women have taken over such difficult, back-breaking agricultural operational tasks from the men. Most women either now do these in addition to planting, weeding, fertilizer application, harvesting and marketing; either directly, or indirectly, by paying others from their meagre resources, to do them; making them further impoverished. When poor women are compelled to do these tasks themselves because they lack the resources to pay others to do them, the result is a heavy toll on their health, since they are ordinarily not as strong as the men.

The burden that the climate change-induced displacement of men places on women has been aptly captured by the United Nations Development Programme (UNDP) as follows: "Women who become heads of households after the men leave to find work elsewhere must assume traditionally male responsibilities without having the same or direct access to the financial, technological and social resources that the men had. Furthermore, the amount of money that men send home depends on the often unreliable economic opportunities open to them" (UNDP, 2009). This means that climate change exacerbates the poverty of already poor women. Indeed the UNDP (2007) has concluded that climate change amplifies gender inequality.

One of the gendered effects of the climate change-induced displacement of men is the emergence of more and more female-headed households (FHHs). Indeed the Federal Government of Nigeria (FGN, 2000), has confirmed this emerging trend by acknowledging that one of the major consequences of drought-induced migration is family separation, as the men usually abandon their wives and children to seek for alternative employment and sources of

income in urban centres. As the effects of climate change are projected to continue, intensify and escalate, at least in the nearest future, the Christian Aid has been quoted as warning that the number of internally displaced persons (IDPs) will correspondingly escalate dramatically, as the number of those already displaced is expected to be joined by an equal magnitude of new numbers (Bridge, 2008: 8).

The months of September and October 2012, Nigeria experienced the most severe manifestations yet of climate change. There was an unprecedented over flow of all water channels as a result of heavy and prolonged rain fall. The result was the loss of farm lands, fishing grounds and biodiversity. Hundreds o thousands of people were internally displaced. Properties worth billions of naira were lost. The core Niger Delta States of Edo, Delta, Bayelsa, Rivers were the most affected. In many cases, whole settlements were submerged and sacked, and had to be resettled and relocated. The expected long term gendered effects include the large scale emptying of the rural areas as a result of the urban migration of the men who have lost their entire livelihoods. Although women have also lost their livelihoods, even when they are displaced, they would still be tied to the ravaged land in the rural areas. For these women, their woes and burdens are twofold. First, they are abandoned by their husbands, who have gone to face uncertain fortunes in the cities and so cannot be relied upon to support their families in the rural areas. Second, even their normally vulnerable livelihoods are made even more vulnerable through outright loss and or deterioration of the stock of whatever is left.

10. THE GENDER-ENVIRONMENT-LIVELIHOODSNEXUS, CLIMATE CHANGE AND THE MILLENNIUM DEVELOPMENT GOALS (MDGs)

In September 2000, the Millennium Declaration was ratified by 189 Heads of States, the largest ever of such a gathering, at the United Nations Millennium Summit. The Declaration outlined eight broad goals, which are now known as the Millennium Development Goals (MDGs).Within each of these goals, are eighteen targets; most of them set for 2015, using 1990 as the benchmark.

The Millennium Development Goals represent a global commitment by all nations signatory to the Declaration, to reduce poverty and improve lives. Although climate change is not isolated as an agenda item to be targeted by the goals and their targets, gender is explicitly identified. However, several of the targets have implications for the gendered goals, to the extent that they are in turn either directly or indirectly

affected by climate change. To that same extent, therefore, it has been warned that climate change could significantly affect, and indeed seems to have been affecting progress towards achieving many of the goals (UNDP, 2011). In fact, the Secretary-General of the United Nations, Ban Ki-moon, is quoted to have said in 2007 that: "climate change is a serious threat to development everywhere. Indeed, the adverse impacts of climate change could undo much of the investment made to achieve the Millennium Development Goals…." (UNDP, 2009: 3).

Below, in Table 6, an attempt is made to establish and confirm some of the linkages between climate change and gender, and particularly their implications for livelihoods, on the one hand, and how these linkages affect the achievement of some millennium development goals, on the other.

Table 6: Gender, Climate Change, the Environment and the Millennium Development Goals

S/N	MDG	EFFECT OF CLIMATE	IMPLICATIONS FOR WOMEN
1	Eradicate extreme poverty and hunger	The main solutions proposed to eradicate extreme poverty and hunger could be affected and impeded, by among others: agricultural subsistence; commercial production; food security; access to safe potable drinking water; use of forests, which are in turn affected by climate change. In September 2012, several parts of the states that abut Rivers Niger and Benue (including Edo, Bayelsa, Rivers and Delta States in the Niger Delta Region) were inundated by flood and whole settlements were submerged. Lives, and billions of Naira worth of houses, household properties, farmlands and livestock were lost.	Many women in the Niger Delta Region collect non-timber forest products which they use for fuel, medicines or food for both man and livestock, and also as sources of supplementary incomes. Consequently, the reduction or disappearance of these products threatens their livelihood assets and strategies, and endangers their own and their families' welfare and quality of life; thereby frustrating efforts at reducing extreme poverty and hunger. Indeed, the Nigerian Meteorological Agency (NIMET) warned that food crisis was imminent, as a result of the climate change-induced flooding. This means translates into heavier burden on the women who provide food for the household.
2	Achieve universal primary education	Climate change increases the workload of women, and the time needed for agricultural production and other	It is generally women and girls who are responsible for collecting water and firewood. Extending the time and energy they need for these

		subsistence activities such as collecting water and firewood, which could put pressure on families to prevent their children from going to, or to take them (especially the girls) out of school. Increased migration and or displacement of families as a result of extreme climate changes and disasters could interrupt, disrupt and limit educational opportunities of children, particularly girls.	tasks puts their ability to attend or complete school at greater risk. According to UNHCR, 80 per cent of the world's refugees are women and children, which is one reason why the younger generations have limited access to education. As men migrate more often than women, more households are being headed by women. These women often need the girls to help out with family work; preventing the latter from attending and or completing school.
3	Promote gender equality and empower women	Deaths and injuries are gendered effects of extreme climate change events such as droughts, floods, landslides and storms, to the extent that they may affect women and men in different ways; depending on their independence (or otherwise) and the means they have at their disposal to ensure their own safety.	In different regions of the world (including the Niger Delta Region), institutionalized restrictions on the independence and empowerment of women hamper their access to shelter or medical care during droughts, oil spills and floods. Women are, therefore, disadvantaged during rehabilitations and compensations and ultimately disempowered. Loss of natural resources and agricultural productivity not only disempower them, but also increases women's workload; leaving them with less time to participate in decision-making processes on conservation; thereby sustaining or even widening, rather than closing the gap between men and women.
4	Reduce infant mortality	Climate change negatively affects health because it heightens people's vulnerability to diseases caused by poor nutrition, poor quality water, increase in vectors and more favourable conditions for spreading viruses associated	Due to women's traditional role of taking care of family health, their workload will increase and so will their probability of being infected with communicable diseases, and become sick themselves. Loss of biodiversity and

		with temperature and heat.	particularly medicinal plants, used by women impedes their traditional capacity to treat some ailments. Pregnant women are particularly susceptible to water-borne diseases (such as diarrhoea and dysentery), and malaria. Anaemia, as an effect of malaria, causes one-quarter of maternal mortality. The high index of mortality of mothers/women during climate change-related disasters causes an increase in infant mortality and more children to be orphaned.
5	Improve maternal health		
7	Ensure environmental sustainability	Climate change causes biodiversity and species depletion, loss and even extinction; changes in their composition, alterations in symbiotic relationships and trophic chains, and other phenomena. Such alterations change the quantity and the quality of available natural resources and reduce the productivity of ecosystems. Climate change affects natural patterns of precipitation, floods (as exemplified by the occurrences in September, 2012) and droughts.	Without guaranteed and secure access to, and control over, natural resources (land, water, cattle, trees, etc.), women are less likely than men to be able to confront climate change. Limited and shrinking availability of drinking water increases the work of collecting, storing, protecting and distributing it, and has negative impacts on the work done by women. Measures to adapt to climate change, including those related to combating drought, generally require long, hard working days. At all levels (local, national, regional and international), women are not represented or do not participate in decision-making on climate change. Most policies on climate change do not reflect women's ideas, needs and priorities. Decrease in forestry (especially

			non-timber forest) resources used by women; rural women in developing countries collect forest products and use them as fuel, food, medicines or food for their livestock. The reduction or disappearance of these products has a negative impact on the well-being and quality of life for them and their families. Environmental degradation in areas where women obtain their resources (particularly non-timber forest products) may lead them to illegally exploit resources in protected areas.

Sources: Culled from Aguilar, et.al. (2007), Dankelman, et al. (2008), UNDP (2003) and Oxfam (2005).

Table 6 shows that both directly and indirectly, unmitigated and persistent changes in climatic elements, parameters and properties can have huge and ramifying implications for the environmental resources upon which the majority of the livelihoods of women depend. The consequences of these effects are ultimately transmitted through the affected livelihood assets and strategies, to determine the extent to which several millennium development goals (MDGs) can be achieved. Specifically, they determine the extent to which women can reduce their poverty and hunger (MDG1); children, particularly girls, can be free to go to school, and or complete their education (MDG2); the gap between men and women can be reduced through the empowerment of the latter (MDG3); infant mortality can be reduced (MDG4); maternal health improved (MDG5); as well as the overall sustainability of the environment can be ensured (MDG7).

11. COLLATERAL DAMAGES

Some of the economic and social costs (burdens or losses) borne by women and their girl children due to their culturally allocated gender-environmental roles have already been noted in this Report. These include: having little or no time for productive, income-earning activities and inability to participate or sustain and complete participation in social and self-development activities like education. In addition to these, women suffer huge collateral health damages. Because of its unique significance, in this section we have concentrated on those collateral damages that are associated with the collection and use of biomass

fuel. For the purpose of this discourse, damage shall be understood to mean any negative effect arising from dependence on fuel wood as the source of household energy.

Recent studies have shown that although the Niger Delta Region is a fast urbanizing area, most of the population will continue to live in rural settlements for some time to come, considering that only about 1.0 per cent (or 98 out of the 13,329) of the settlements in the area in 2003 were classified as urban (CPED, 2003). Furthermore, many of the people who move into the urban centres from rural communities tend to retain most of their rural habits and practices, especially those regarding household cooking energy utilization (Omuta, 2012). This is so because migration from rural to urban places does not translate to an automatic change in economic status. Consequently, the rural energy poor remain poor regarding energy consumption when they arrive in the city. Thus, even when they are deemed to have 'settled down' to urban life, most of them still continue to use fuel wood as the source of energy; particularly for cooking. This is confirmed by Gabriel (nd: 6), who observed that even in Port Harcourt, the capital of Rivers State, and probably the largest urban centre in the Niger Delta Region, "… most women who sell bean cakes and operate restaurants use mangrove wood for cooking. Many bakeries depend on mangrove wood". Consequently, the pressure that population puts on environmental resources, (particularly, the collection of fuel wood) transcends the rural-urban divide. Propelling this pressure is the pervading and deepening poverty, which compels people to use environment-polluting, so-called 'dirty energy' that occupy the lowest rungs of the energy ladder, namely: crop wastes, wood and charcoal (Figure 12).

Users of energy sources located at the lowest rungs of the energy ladder are said to experience '***energy poverty***' and are classified as ***energy poor***. They are those who depend on crop waste, dung, fire wood and charcoal as their predominant source of energy. Since culturally, sourcing household energy is allocated to women, they are the ones that are most exposed to the dangers and collateral damages associated with energy poverty, as indeed, any other indicator of poverty. Consequently, both the energy poor rural women the energy poor urban women put pressure on natural or environmental resources, to meet their energy needs.

And, in spite of technological developments, Karekezi, Lata and Coelho (2004) have argued that, based on the projected continued poverty of the Africa region, this pressure will not only be sustained, but is in fact expected to increase up to the year 2020 and beyond (Table 7).

Table 7 shows that globally, the consumption of fire wood, in relation to total energy utilization will decline from 14.20 percent in 2000 to 11.00 per cent in 2020. Probably more curious is the projection that while the consumption of biomass fuels in relation to total

energy use will decline by almost 50 per cent in Asia (from 42.30 per cent to 22.80 percent) and in Latin America (from 19.57 per cent to 10.0 per cent), using 2000 as the base year, it is only in Africa that it will continue to increase, even if only marginally, from 58.40 percent to 59.0 per cent, by 2020. Indeed, it is only in Africa that biomass will be utilized by more than 23 per cent of energy users. This is almost six times the global average.

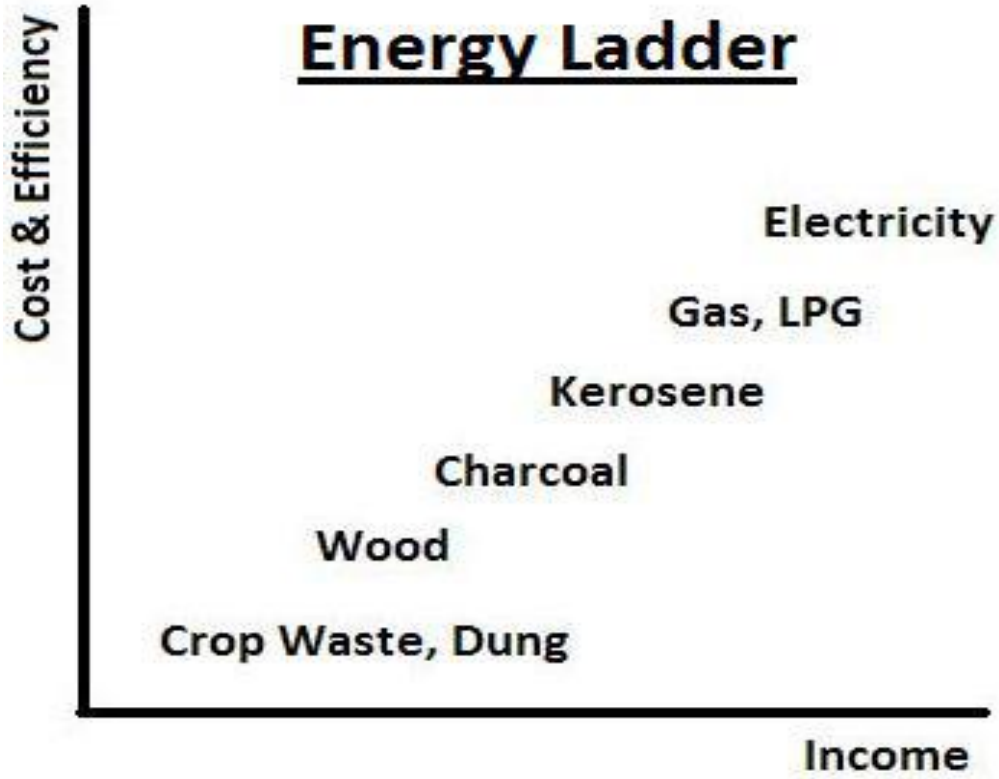

Figure 12: The Energy Ladder: The Relationship between Income, the Cost and Efficiency of Type of Household Energy

The projected continuation of the energy poor to depend on environmental resources to meet their household energy needs means that women will not only continue to depend on these resources, which over the years have constituted a huge burden to them, but that they will also continue to be victims. By implication, it means that they will continue to bear the collateral damages of the gender-environment-livelihood nexus. In this section, we have briefly outlined three dimensions of the collateral damages that women suffer, namely:

- environmental damages,
- health damages, and
- Economic damages.

Table 7: Projected Final Biomass Consumption in Relation to Total Energy Use, 2000 and 2020

Country or Region	2000				2020			
	Biomass (Mote)	Conven-tional Energy (Mtoe)	Total (Mtoe)	Share of Biomass (%)	Biomass (Mtoe)	Conven-tional Energy (Mtoe)	Total (Mtoe)	Share of Biomass (%)
China	214.48	943.4	1,157.9	18.50	224	1,524	1,748	13.00
Asia	343.20	467.74	810.94	42.30	394	1,336	1,730	22.80
Latin America	69.34	284.96	354.30	19.57	81	706	787	10.00
Africa	**221.10**	**157.37**	**378.47**	**58.40**	**371**	**260**	**631**	**59.00**
Total non OECD	859.65	2,417.86	3,277.51	26.23	1,097	5,494	6,591	17.00
OECD countries	126.17	3,551.32	3,677.49	3.40	96	3,872	3,968	2.00
World	**985.2**	**5,969.18**	**6,955**	**14.20**	**1,193**	**9,365**	**10,558**	**11.00**

Source: Karekezi, Lata and Coelho, 2004: 6.

Environmental damages

The major environmental concern in this Report revolves around the mode of conversion of raw biomass to household cooking energy. It has been asserted that the use of the traditional three-stone open-air cooking stove, or its metal and steel variants, gives a very dismal conversion efficiency rate of only 7-12 per cent (Kaale, 2005). In other words, as much as 93 per cent, but certainly not less than 88 per cent of the potential heat energy of biomass fuel is lost and wasted (Figure 13). This is also the corresponding proportion of environmental resources that we lose due to inefficient use. The implication or cost to the ecosystem of the current biomass conversion technology is that more trees and grasses or other natural sources of biomass fuels would have been standing in our forests today, if the technology for concerting fire wood to household energy were more efficient.

Wokocha (2010) sought to establish if poor rural fuel wood users in the Rivers State are aware (or ignorant) of the damage that the practice does to the environment and ecosystem. The findings on this, among others are presented in Table 8.

Table 8 shows that, with respect to energy poverty and the physical environment; households are not ignorant of the negative environmental impacts of their dependence on biomass fuels. Indeed they not only know, but also confirmed that, as victims, they have been affected by some of the negative impacts. Rather, their constraint is poverty, which is manifested in the lack of, or inadequate

access to safer and more environmentally friendly alternative fuels to choose from. In order words, the Table shows that apart from acknowledging the fact that biomass usage may be less polluting to water sources; users of biomass fuels know that:

Figure 13: Inefficient, (smoky) unhealthy use of fuel wood: a veritable cause of collateral damage to women.

Source: *DuetscheGesellschaft fur TechnischeZusammenarbeit* (GTZ), (2007: 15).

- ♠ the smoke from the inefficient conversion processes causes both regional (neighbourhood) and indoor air pollution,
- ♣ the bye products, such as smoke, sooth and ashes degrade the immediate and local environment and make it dirty,
- ♣ the harvesting of biomass fuels from the forest could lead to:

Table 8: Relative Awareness of the Environmental Impact of Biomass Fuel Utilization

Items	Yes	No	Yes %	No %	TOTAL
Burning of biomass causes more air pollution than oil and gas	69	81	46	54	100
The ashes obtained from burning biomass is useful to farmers	84	66	56	44	100
The ashes, smoke and soot can make the environment dirty	124	26	83	17	100
Biomass fuel utilization does not adversely affect soil fertility and food productivity	40	110	27	73	100
Water cannot easily be polluted when using biomass fuel	60	90	40	60	100

Source: Culled from Wokocha, 2010

- deforestation, by removing plant cover,
- biodiversity loss, by removing a wide range of organisms,
- lower soil fertility, by removing the natural fertilizers produced by decomposition,
- poor agricultural yields, as a result of poor soil quality, and eventually,
- further accentuation of poverty by destroying other livelihood assets.

However, in spite of the awareness of these negative externalities, energy poverty continues to compel rural women to inflict damage on the environment by using fuel wood as the only source of household energy. The irony is that they eventually become the victims of these environmental damages

Health damages

In addition to the earlier cited heavy toll that the hard work left by climate change-induced displacement of men places on stranded poor rural women, studies have confirmed that inefficient conversion of biomass energy causes several severe health disorders, such as asthma, respiratory complications, cough, pneumonia, bronchitis, eye and skin irritations, among others (Wokocha, 2010; Smith, 2006). As victims of the gender-environment-livelihoods nexus, women, especially those living in rural areas, suffer these collateral health damages due to prolonged use of inefficient modes of biomass energy conversion. This is the inevitable consequence of their correspondingly long exposure to the emanating health hazards of the bye products of the inefficient conversion processes. Indeed, the Nations Development Programme (UNDP, 2009: 32) has cited Aguilar (2004) as claiming that worldwide, pollution in homes caused by the smoke from burning fire wood kills about two million women and children every year! The results of a study of the collateral health damages of the use of biomass fuels by the energy poor in the Niger Delta Region are presented in Table9.

The Table shows that women are aware of the global association between the use of biomass and their potential health status, namely, that:

- ♣ smoke and soot from burning wood fuels cause respiratory complications, such as asthma, cough, pneumonia and chronic bronchitis.
- ♣ bye products of the process of converting fire wood to energy (suspended particulate matter) cause chronic pulmonary disease, including those associated with smoke and soot, and eye problems such as cataracts, as has also been confirmed by Smith, (2006),
- ♣ inefficient modes of conversion, especially the traditional three-stone open fire stove, could result in fire outbreaks, which could result in the deaths of entire families and households, or most usually the women and children.
- ♣ combustion products could also cause blood disorder,
- ♣ biomass fuels cause heat rashes and other skin diseases,
- ♣ wood combustion products can include toxic and carcinogenic substances which contribute to human health challenges and increase hospital admissions and associated health bills for asthma and heart disease patients, as has also been confirmed by Warwick and Doig (2004), and
- ♣ the health hazards of biomass fuel are far more than that of oil and gas.

Table 9: Relative awareness of the Health Impact of Fuel Wood Usage

S/N	ITEMS	YES	NO	YES %	NO %	TOTAL
1	Inhaling smoke and soot from burning biomass fuel causes respiratory track problems such as cough, asthmas, etc.	134	16	89	11	100
2	Combustion products also affect the eye vision	140	10	93	7	100
3	Burning biomass fuel also causes blood disorders	80	70	53	47	100
4	Utilization of biomass fuel results in fire outbreak (which could cause death)	100	50	67	33	100
5	Using biomass fuel causes heat rashes and other skin problems	96	54	64	36	100
6	The health risk of using biomass fuel is less than that of oil and gas (fossil fuel)	112	38	75	25	100

Source: Culled from Wokocha, 2010.

However, in spite of this awareness, because rural poor women have no, or very limited energy options, they continue to use firewood to cook and heat their homes, even at great risk to their health.

Economic damages

One other major disadvantage that women suffer stems from the cultural economic valuation of biomass fuels. Traditionally, in the rural areas, fire wood is regarded as a '***free good***', because it is commonly gathered freely from the bush, as a common pool resource. But the fact is that fuel wood is an 'economic good' and of obvious economic value as much as any other item that contributes to the maintenance and sustenance of the household. As a result of this rather faulty and discriminatory cultural perception, all the time and energy that rural women spend collecting fire wood are regarded as 'free service', rather than an economic contribution to the sustenance of the household.

However, when the urban man (who has the means and can afford them) buys the electric or gas cooker and pays the energy bill or refills the gas cylinder (which are the equivalent of what the biomass-collecting woman does), he is considered to be making a significant economic contribution to the maintenance and sustenance of the household. This institutionalized undervaluation or devaluation of the woman's contribution to the maintenance of the household, and particularly, the under pricing of the contribution of women to the maintenance and sustenance of the household, and particularly, the under pricing of the biomass fuels collected by women and the water that they fetch, is considered not only discriminatory but indeed an economic damage to them.

12. ISSUES AND DEFICITS

Most of the arguments and debates supporting actions and programmes that mitigate the burdens that the environment places on women as a result of their gender roles and societal division of labour are located within the ***ecofeminism*** discourse. ***Feminism,*** generally, is the belief in women's rights and equality. It is a belief that women are presently victims of, and suffering from deprivation, exploitation, oppression, domination and subjugation in various aspects of life, in comparison to men (Idyorough, 2005: 14). When the particular aspect of suffering is related to the environment, then the discourse is specifically situated within the domain of *ecofeminism*. While there is no central or consensual definition of ecofeminism, it is generally regarded as a feminist approach to environmental rights, ethics and ecological issues. Ecofeminists see the domination of nature by man, on the one hand, and the oppression of women, on the other, as interconnected (Feministcampus.org / fmla/ printable-materials/ Women_ Environment.pdf).

The ecofeminist philosophy recognizes, explores, interrogates and analyzes the connections between the behaviour that harms the environment and the behaviour that oppresses women. A basic premise of the ecofeminist position in environmental management is the rejection of the assumed or perceived inferiority of women and nature, on the one hand and of the superiority of humanity and culture, on the other (Plumwood, 1992: 13). Shiva (1988) conceptualizes the link between women and the environment mainly in ideological terms. Her argument is that there are important connections between the domination and oppression of women, on the one hand, and the domination and exploitation of nature, on the other. Because the domination of women and of nature occur together, as co-oppressed parties, women have a particular stake, sympathy and concern in preventing over-exploitation of nature. Consequently every experience that makes women victims and puts them at the disadvantage of seeming inferiority must be critically interrogated and tackled.

To guide this interrogation, actions that protect the environment are perceived to ultimately translate into the protection of the rights and livelihoods of women and eventually enhance their welfare and lessen their burden. Put the other way, considering their culturally determined and environmentally dependent roles, one way of alleviating their burdens is to improve or enhance their relationship with the natural resources of the environment.

Any policy that seeks to achieve these objectives must be guided by an adequate appreciation of the present challenges and deficits. Five of these challenges are considered in this section of the Report, namely:

- depletion of common pool resources;
- dwindling stock of biomass fuels;
- unaffordable alternative fuels;
- land competition for food and fuel; and
- gender marginalization.

Depletion of Common Pool Resources (CPRs)

A recent report on the energy consumption of the poor in the Niger Delta Region has confirmed that there is an inverse relationship between levels and intensity of poverty and exploitation of *common pool resources* (CPRs) (Omuta, 2011). This has been further reaffirmed and verified earlier in this Report. Common pool resources are those resources whose characteristics make them very costly and difficult, but not impossible to exclude potential beneficiaries from obtaining and exploiting the benefits from their use. Incases of sustained extreme pressure, when all controls and regulations break down, common pool resources have been converted to *open access resources* (OARs). An open access resource, on the other hand, is one where it is impossible to control the access of individuals who want to use it. Common examples are a fishery, or (in the classical example of the 'Tragedy of the Commons') a common pasture. Consequently, CPRs often face the

challenges of congestion, overloading and consequent overuse or overexploitation. From the point of view of the gender-environment-livelihoods nexus, non-timber forest products (NTFPs) fall into the category of CPRs in the Niger Delta Region. This is because the poor rural and even poor urban women depend overwhelmingly on NTFPs as livelihood assets, being the sources of household energy, as well as a source of food and supplementary income, more than the rich, whether in rural or urban areas. And, although it is possible to control the exploitation of non-timber forest resources for food, energy and other uses, it is very challenging, difficult and nearly impossible.

The truism that poverty fuels the dependence on NTFPs has been fully established both in the literature, and in this Report. Generally, poverty may be understood as the lack of security in the possession of the physical elements of good living; manifested in the total lack of, or inadequate access to, the means of generating and sustaining those elements (NDES, 1997). The practical translation of the concept shows that poverty is pervading in all its ramifications in the Niger Delta Region. In other words, whether it is defined in *absolute* terms, as the lack of the means to access basic human needs such as food, energy and shelter; or in *relative* terms, from the societal comparative point of view; or in *administrative* terms of the failure of the state to protect and provide for those who are (even temporarily) vulnerable; or c*onsensually*, in terms of public perception; or *contextually* in terms of relating it to different socio-cultural and economic levels, poverty finds its very eloquent and bold expression in the Niger Delta Region of Nigeria (Omuta, 2011).

AUNDP (2006) survey mirrors this conclusion. Although the region's Human Development Index (HDI) of 0.564 is higher than the Nigerian HDI of 0.448, the Nigerian and Niger Delta Region indices are far below those of regions and or countries with similar gas and oil resources and reserves. For instance, in Venezuela, the human development index is significantly higher at 0.772, while in Indonesia it is also very impressive, at 0.697 (UNDP, 2006: 15). Perhaps more noteworthy, is the observation that when disaggregated at the local government level, the UNDP survey shows that state and regional HDI scores tend to be misleading because they mask the rather sharp inequalities in the levels of human development between oil producing and non-oil producing communities. Thus, paradoxically, and rather intriguingly, local government areas without oil and gas resources and facilities appear to have fewer poor people than those with oil and gas! (UNDP, 2006: 15). Furthermore, the report concludes, also paradoxically, that decline in the Human Development Index (HDI) has been steeper for the Niger Delta states than the rest of Nigeria (UNDP, 2006: 137). In other words, poverty not only exists, it is deepening in the Niger Delta Region.

Perhaps, as studies have abundantly shown, the most eloquent expressions of poverty in the region are the very high dependence on forest resources, particularly non-timber forest products for sustenance, especially by poor rural women. Hossain (2008) claims that there are as many as 150 non-timber forest products with commercial value in the international market. This is an indication of the richness of the 'warehouse' that nature has provided for the poor. Among those that have been discovered and are commonly exploited are:essential oils, a very wide variety of medicinal plants, gum-arabic, rattan, tree barks, wrapping (and other types of) leaves, seeds, ferns, thatches, roots, cinnamon, herbs, fodder, reptiles, birds, mammals, hides and skins, resins, incense, wax, bamboo, fruits, such as 'bush mango', natural honey, brazil and other edible nuts, mushrooms, various types of fibre, and shea butter and other types of wild nuts and seeds used in cooking, skin care and for other purposes.

However, the sustainability of any natural resource, including NTFPs, must recognize that development (economics) and environment (ecology) are not mutually exclusive of one another but rather, they are complementary, interrelated and inter-dependent. Indeed, they are ultimately mutually reinforcing. When development takes place without injury and damage to environmental resources, through destruction, depletion and scarcity, then the processes associated with two components are said to have been decoupled. In this connection, however, we reiterate also that it must always be recognized that every natural ecosystem has a finite carrying capacity, which sets the limit to the amount of development that it can accommodate without the stresses that produce deterioration and scarcities.

This limit must be respected and maintained through a delicate balancing of its regenerative capability and rate of exploitation of its resources. When the balance between economic feasibility and ecological sustainability is upset and an ecosystem is overloaded in excess of its carrying capacity, it would no longer be able to support and sustain its resources and the dependent livelihoods assets and systems. However, in every ecosystem in a *laissez faire*st ate, there would almost always be certain external circumstances that put unsustainable pressure on environmental resources and consequently cause them to be vulnerable, in terms of their quantity and quality and make the livelihood assets and strategies unsustainable.

Over the years, particularly in the past forty to fifty years, when the Niger Delta Region became Nigeria's most active economic resource frontier and environmental 'cash cow', the non-timber forest products have come under increasing and sustained pressures arising from, among other factors:

- ♣ increasing population, and by implication, the sheer volume of

demand for environmental resources;

- ♣ the reckless and environmentally insensitive and unsustainable operations of multi-national oil companies (MNOCs;
- ♣ the effects of climate change on the fragile ecosystem; which have consequently reduced the stock, and degraded the quality of NTFPs due to floods and droughts; and
- ♣ the pervading and deepening poverty that has compelled more and more women to revert to 'mother nature' and particularly, non-timber forest products, as livelihood assets, for the survival and sustenance of their households.

These pressures have been further aggravated by the cumulative ravages of long years of mismanagement as manifested by high rates of deforestation and illegal logging, draining of swamps, sand-filling, cutting of pipeline tracks, canalization and channelization and other activities that have altered the ecosystem and consequently endangered the forest species. The overall result of these pressures is that NTFPs have been depleted and what is left has been expectedly overexploited. Without a strong and sustained policy intervention, the livelihoods of most poor rural women who depend overwhelmingly on these resources will be in greater jeopardy. This would further increase their already heavy burden, and make it more difficult to escape the vicious poverty trap.

Dwindling Supply of Biomass

The efforts and energy that women put into meeting the high and increasing demand for energy for cooking food and space heating make its supply a correspondingly important aspect of the livelihoods of the rural and urban poor. Its place in the livelihoods and burdens of women can, therefore, be hardly over-emphasized. Gl0bally, in all areas where biomass fuels are the major sources of household energy, as it is in the Niger Delta Region, there is now abundant evidence that its demand far exceeds its supply. This is in conformity with Dausareus's (1966) ***law of aphasy*** earlier cited by Sada (1988) to the effect that "… on the average, organic evolution is slower than environmental change". There is, therefore, a deficit and need gap.

Almost forty years ago, Eckholm (1975) drew attention to the growing use of wood by the poor for fuel in developing countries and noted an empirical connection between poverty and unsustainable fuel wood harvesting. After considering all things, he perceptively concluded that the world was heading towards, what he called, ***the other energy crisis,*** namely; the shortage of biomass fuel.

Graphically, the global scenario for the forty-year period from 1975 to 2015 is presented in Figure 14. The signals and the clear message that Figure 14 sends to environmental managers and policy makers is that the dependence of the poor on biomass fuels cannot be sustained without a strong policy intervention. In other words, deliberate

and strong policy efforts are needed to accelerate the rate of replacement of consumed wood fuel. This is particularly urgent in a region like the Niger Delta of Nigeria, where the environment is not only fragile and delicate, but has been relentlessly and very callously assaulted, degraded and indeed destroyed, for decades, in the process of exploiting it soil and gas resources for national development. A *laissez faire* attitude could mean that availability will fall to the level that finding and collecting wood fuel could become a full-time job for women and girl children, with its attendant consequences for their economic productivity and health.

Almost four decades after, Eckholm's predicted scenario has been upgraded from that of apprehension to the realm of reality. Consequently, whether policymakers choose to play the ostrich and not talk about it or not, the '***other energy crisis***', the shortage of fire wood and the consequent pressure on women is not only real but will be expected to continue to escalate. Therefore, policy intervention is not really an option; it is a very urgent necessity. Indeed, it is imperative in order to sustain the environment, in general, and biomass fuels, in particular, and more importantly, protect the livelihoods of women and reduce the burden on them.

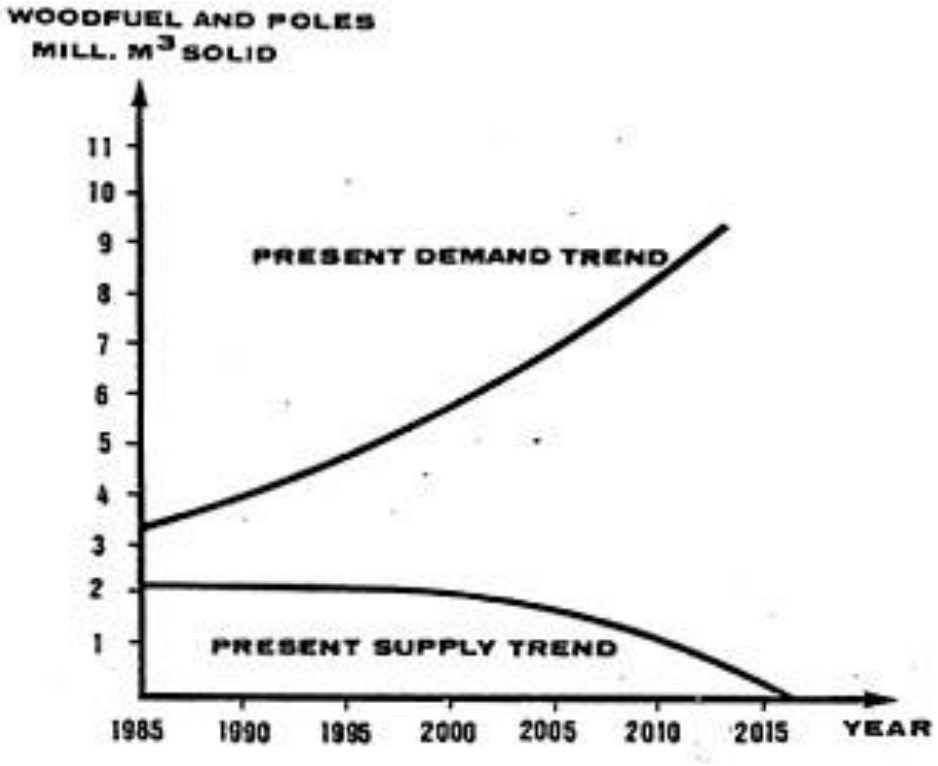

Figure 14: Fire wood demand and supply projections in Shinyanga in 1985 (Adopted from Wiskerke, 2009: 34).

This imminent, overarching and worrisome scenario has been variously and strongly implied by studies in Nigeria, in general, and the Niger Delta, in particular. For instance, as early as 1988, Mabogunje (1988) warned that "the forest resources of Nigeria are not capable of meeting the fire wood demand", estimated by the FAO at 54 million cubic meters in 1985. By 2005, the figure was claimed to have risen to 80 million cubic meters (Sambo, 2005).Mabogunje (1988*)* then concluded that "the fire wood crisis is going to stay with the rural population for a long time to come". Aina and Salau (1992) reaffirmed this later.

Unaffordable Alternative Fuels

The rising demand for, and dependence on, forest resources for household fuels in both urban and rural areas is the result of the absence of affordable better alternatives. Studies have shown that as a result of the often protracted perennial shortages, the cost of kerosene and liquefied petroleum gas (LPG) rose between 900 and 1,000 per cent between 1991 and 1994 (Momah and Soaga, 1999; Babayara and Saleh, 2010). Such astronomically huge hikes cause more and more marginal households to slide down the energy ladder (Figure 12), with poor and rural women, as usual, spending days on end in cues waiting for the product and bearing the brunt, as the victims that are expected to provide the cooking fuel.

A number of environmentally friendly and cleaner energy alternatives have been proffered and are indeed available to some extent. These range from ethanol, other biofuels, liquefied petroleum gas, electricity to solar. We are aware that some countries in Southeast Asia (like India) and South America (like Brazil) have made considerable progress concerning the popularization, mass production and utilization of some of this alternative energy. Indeed the possibility of domesticating, customizing and commercializing these alternative technologies in Nigeria should not only be encouraged but must be aggressively prosecuted.

However, one thing that is common to all forms of clean and environmentally-friendly energy is that the technologies needed for their production, commercialization processes and utilization, are invariably alien to the vast majority of the poor and illiterate population of most developing countries. This is because they tend to be very sophisticated and or complex and above all, capital intensive. Consequently and expectedly, they are either not commonly or easily available, or where and when available, they are usually very expensive and unaffordable. In fact, Lara (2004) claims that globally, more than two billion people have no access to clean energy sources, and that the vast majority of these are generally women who, in the face of poverty and lack of alternatives, must collect fire wood and other biomass products to meet their energy needs. In other words, the issues and constraints of availability and affordability disqualify the mass adoption and utilization of these

alternatives, at least in the very short run.

Gabriel, (nd: 6) has attempted to present a partial portfolio of the available and affordable energy needs and demands, as the premise for expecting the continued use of fuel wood in the Niger Delta Region, at least in the short run, as follows:

> Women are solely responsible for fish processing and fish smoking in the Niger Delta. In the mangrove swamp area, they depend largely on mangrove wood, which burns even when it is relatively wet and produces charcoal. Women, who do not engage in fishing at all, buy off catches from the men folk or buy cartons of imported iced fish and smoke with mangrove wood. In Nigeria, where gas and kerosene scarcity is a regular feature, electricity is not wide spread and in the Niger Delta (the rural communities in particular) where there is no depot for kerosene, domestic gas and electricity is non-existence, reliance on mangrove wood will continue. In Port Harcourt, most women who sell bean cakes and operate restaurants use mangrove wood for cooking. Many bakeries still depend on mangrove wood.

Given the present economic realities, per capita incomes are not expected to rise appreciably soon in Nigeria and the Niger Delta Region. Consequently, and since poor households do not normally have the required collateral that grants them access to the traditional bank facilities, they would be unable to upgrade their economic status to be able to afford clean and environmentally friendly and healthy energy (kerosene, liquefied petroleum gas and electricity) and the gadgets needed to use them (kerosene/gas/electric cookers and stoves). In other words, economic affordability continues to be a core policy challenge that must be tackled in the resolution of the burden that the gender-environment-livelihoods nexus puts on women (Surge, 2006), in the Niger Delta Region.

Land Competition for Food, Fuel and Non-Timber Forest Products

One of the major implications of the gender-environment-livelihoods nexus so far, is that the rural poor woman depends on land resource as the natural source of wood for household energy, as well as other non-timber forest products that constitute a very wide variety of livelihood strategies, including supplementary income. Above all, she also depends on the land for the most important need of mankind, namely: food. These demands obviously, put pressure on the land, especially in a delicate ecosystem, where population, human activities and other demands for land resources are correspondingly increasing. This creates a major policy issue, generally, in developing countries. This is how Soda

and Ravindranath's (1999) survey of the situation puts it:

> "The availability of land for the production of biomass in developing countries is determined by the demand on land for food production. With increasing population, food production and consumption in developing regions is expected to increase (FAO, 1995). Estimates by the Response Strategies Working Group of the IPCC indicate that the use of land for food production in developing regions (Asia, ***Africa*** and Latin America) will increase by 50 per cent by the year 2025 (IPCC, 1996). In addition, the demand for biomass energy is also expected to increase with population increase. Estimates by the World Energy Council (WEC) indicate that by 2100, about 1,700 million hectares of additional land will be needed for agriculture, while about 690-1,350 million hectares of additional land would be needed to support biomass energy requirements (UNDP, 2000). ***The challenge, therefore, is that of' decoupling'; that is ensuring sustainable biomass supply to meet growing energy demand, without taking up land for food production.*** Some of the options for avoiding the competition for land between food and fuel are: increasing food production on current agricultural lands; the establishment of large tree plantations; and, the use of modern forestry practices (IPCC, 1996)".

This scenario is a pointer to the fact that, without an appropriate, responsive, sensitive and equitable land management policy, the projected and anticipated large-scale modern biomass energy development, on the one hand, the dependence on the land for food and non-timber forest products for survival, on the other, can lead to further acceleration of the marginalization of the rural poor woman. This is so because women do not normally have title to the land on which they depend for the collection of fuel wood and non-timber forest products. The competition for land between the demand for food and the demand for energy must, therefore, be properly managed and satisfactorily resolved. This policy challenge is not only very significant but also delicate, because the provision of both food and household energy are the traditional responsibility of the poor rural woman. The implication is that if the policy tilts towards one, it will only transfer the pressure from the one that is not favoured to the woman, while if the reverse is the case, it is still the woman who bears the pressure. Thus, head or tail, the woman is the victim; and the

goals of reducing extreme poverty and hunger, on the one hand, and the promotion of gender equality, on the other, will be jeopardized.

Gender Marginalization

There is a Yoruba adage in Nigeria to the effect that '***it impossible to barb a person's hair in his or her absence'***. In the context of this Report, the parallel is that all efforts at sustaining the supply of fuel wood, making the devices for efficient conversion of biomass fuels more affordable, protecting the livelihoods of women, particularly non-timber forest products, and ultimately reducing their burden, will come to little or nothing, as long as there is continued gender marginalization, a structural disconnect in the environmental resources management decision-making process. The underlying argument of gender marginalization is that decisions that affect women and their livelihood assets and strategies should not be taken for them or on their behalf.

For instance, a rather recent study commissioned by the Food and Agricultural Organization (FAO), to determine among other things, the livelihood opportunities offered by the forest reserves in Edo State, showed that although the women of Amahor and Ugun communities, more than the men, depended on the resources of the Amahor Forest Reserve in Igueben Local Government Area (Figure 14) (particularly as their

Figure 14: Women are mostly dependent on the resources in the Amahor Forest Reserve in Igueben Local Government Area of Edo State in the Niger Delta Region

source of medicinal plants and herbs, chewing sticks, roofing materials, snails, wrapping leaves, canes, ropes, fruits (mangoes, orange, pawpaw, cherry, cashew, etc), palm products (oil, kernel, wine, broom, etc), bamboos and vegetables (melon, pepper, tomatoes, greens, etc), among others),not even a single woman was invited to the several community consultative forums organized to design a participatory community-based forest management structure (Figure 15) (CPED, 2006: 34).

Figure 15: Gender Marginalization (total absence of women) in a Participatory Community-Based Forest Management Forum

Gender mainstreaming involves a number of things, including enabling women to have a share or say in how things that directly affect them should be done. This is primarily and usually through ***active participation***. However, having a share or say is, usually, not always enough, since such processes have been known to be manipulated in favour of those who have monetary, political, even traditional and cultural power. Consequently, all things being equal, active participation will enable women to be fully involved in identifying their challenges and needs, planning, designing, implementing, monitoring and evaluating programmes and projects targeted at addressing their burdens. The implication is that women have to be an integral part of policy and decision making.

Strictly speaking, mainstreaming means the transformation of the development process in such a way that gender issues are well covered and protected by removing all structural obstacles (Idyorough, 2005: 11, 16). Hitherto, women's wealth of practical environmental experience had been stifled through an unresponsive and a negatively skewed decision-making process. There must, therefore, be a transformation if the burden that the gender-environment-livelihoods nexus places on women must be lightened or removed.

Experience and studies have shown that women in the Niger Delta Region play very strategic and key roles in the traditional economy, especially in the agricultural sector, where they are not only the major producers and processors but also the marketers. If agriculture is a key element in the sustainable diversification of the economy of the Niger Delta Region, and women are the key players in that sector, then logically women must be empowered to fully integrate into, and actively and meaningfully participate in it. They must be enabled to have access to all the needed and necessary productive resources to operate maximally and optimally in the

agricultural sector. This means access to land, appropriate technology, information and credit, among others. This has very obvious implications for the extant laws and traditional norms c0ncerning land ownership, as well as inheritance practices.

The significance of women in the development of the region must not only be noted but must be emphasized. As was established earlier, 74 per cent of the households in the Niger Delta Region depend on biomass (fuel wood) for their cooking energy. Omuta (2011) recently concluded that this figure could be much higher, in reality. This is so because kerosene (which is the second choice of cooking energy) is almost always scarce. And, when such scarcities occur (which is very frequent and often protracted) and costs correspondingly increase and remain high, marginal users slide down in the energy ladder and revert to the use of fire wood. As it has been noted severally, in the Niger Delta Region, as everywhere else in Nigeria, the sourcing of biomass fuels is the exclusive responsibility of women and children. The distances from which fire wood is sourced have continued to increase with rising demand, pressure on forests resources and resultant diminishing stocks. This means more time spent on collecting biomass and the loss of equivalent time for other economic activities and general self development, including education.

Furthermore, we recall that almost all studies have confirmed that women are almost always poorer than men. Therefore, when it is argued that poverty is pervading in the Niger Delta Region, it is mostly women who are caught in its net. If the war against poverty in the area is to be fought meaningfully and won decisively, women must, therefore, be at its centre. It must also be noted that when combatant and militant men are killed in their numerous and perennial confrontations with the forces of government (as it was virtually a weekly and sometime daily occurrence in the pre-amnesty era), it is the women who bear the brunt and are the ultimate victims, as vulnerable widows and mothers. The relevance of women to the development of the region has also been manifestly demonstrated in their ability to mediate and negotiate peace between the youths and multinational oil operators, youths and the government, and among communities in the region. Gender mainstreaming is, therefore, the process that will formalize the leveraging on this great potential and platform.

Unfortunately, in spite of their obviously strategic relevance and significance, men have continued to monopolize decision-making, even in matters that pertain to women. The obvious implication of their alienation is the present avoidable failure of, or sub-optimal results from, the execution of many policies and programmes. Hence, Sen and Grown (1987) are of the opinion that empowerment cannot be achieved without granting 'personal autonomy' to women. Personal autonomy for women means that they should be able to make their own choices and take their own decisions in

the realms of politics, economics and society.

13. A PROPOSED POLICY AGENDA

Corresponding to, and arising from the collateral damages associated with, and flowing from the policy deficits identified in the gender-environment-livelihoods nexus above, the thrust of the proposal presented below is to reduce the burden placed on women. Consequently, the proposal aims at, among other things:

- decoupling natural resource utilization and environmental impacts from women's livelihoods,
- integrating women into the policy architecture for environmental resources management;
- ensuring energy security by ensuring the sustainability of biomass fuels, in the face of dwindling environmental resources; compounded by deepening poverty;
- adopting a more efficient and improved, yet affordable technology for converting biomass into cooking energy;
- diversification of rural livelihoods;
- domestication and commercialization of non-timber forest products; and
- joint forest management.

Decoupling Natural Resource Use and Environmental Impacts from Women's Livelihoods

According to the International Resource Panel (IRP) of the UNEP (2011a), world leaders are now increasingly understanding the anomalies and daunting challenges posed by the seeming conflicts that exist between making progress towards a more sustainable economy, which requires a reduction in resource use at all levels: global, national and local; while human well-being demands that economic activities should expand but expect environmental impacts to diminish. The IRP has developed the concept of '***decoupling***' to attempt to explain and resolve these challenges. At its simplest, decoupling is reducing the amount of resources, such as water or biomass fuels, used to produce and sustain livelihoods and ***delinking*** economic development from environmental deterioration(UNEP, 2011a: xi).

In the literature, decoupling has been resolved at two levels, namely: resource and impact. Accordingly, UNEP (2011a: 4) has defined ***resource decoupling*** as the reduction of the rate of use of (primary, environmental) resources per unit of economic activity. It is a sort of 'dematerialization' "based on using less material, energy, water and land resources for the same economic output". Resource decoupling invariably and ultimately leads to an increase in the efficiency with which resources are utilized. In the context of this Report, for instance, any

technology that improves on the efficiency of the use of biomass by delivering more heat energy from a given quantity of fire wood, would be deemed to be contributing to resource decoupling, because such a technology would require less environmental resources for the same service (such as cooking and or heating) than hitherto.

On the other hand, ***impact decoupling***, requires increasing economic output side-by-side with the reduction of negative environmental impacts. "Such impacts arise from the extraction of required resources (such as groundwater pollution due to oil spillages or use of agricultural chemicals), production (such as land degradation, wastes and emissions), the use-phase of commodities (for example cooking, which results in suspended particulate matter), and in the post-consumption phase (again wastes and emissions)" (UNEP, 2011a:5). Impact decoupling means that negative environmental impacts decline while value is added in economic terms. For instance, if biomass could be converted more efficiently into energy, less pressure would be put on the environment, the women would be healthier, and have more time for more economic contribution to the sustenance of the household economy.

Both resource and impact decoupling can be distinguished between 'relative' and 'absolute'. Regarding this distinction, ***relative decoupling*** of resources or impacts applies to the situation where the growth rate of the environmentally relevant parameter (resources used or some measure of environmental impact) is lower than the growth rate of a relevant economic indicator (for example, GDP). On the other hand, ***absolute decoupling***, occurs where resource use declines, irrespective of the growth rate of the economic driver. This latter relation is shown by the Environmental Kuznets Curve that claims that if prosperity rises beyond a certain point, the environmental impact of production and consumption decreases. Absolute reductions in resource use are rare and occur only when the growth rate of resource productivity exceeds the growth rate of the economy (UNEP, 2011a:5).

Resource decoupling is particularly important and relevant when:

- a specific resource is scarce and its further depletion could frustrate societal progress (such as oil, rare minerals, biomass fuels, or fertile land to produce food for the growing human population) (UNEP, 2010a; UNEP, 2010b), and
- a specific resource poses high environmental risks that cannot be alleviated by using the resource better.

On the other hand impact decoupling is particularly important when:

- the use of a resource poses immediate threats to human and ecosystem health (such as toxic emissions, persistent organic pollutants, impacts on soil fertility or impact of gas flaring on ambient temperature and crop growth),

- technological solutions (such as better ways of converting biomass fuels) have substantial potential to prevent harm to humans and ecosystems.

Decoupling is, therefore, a catalyst to the concept of ***green economy***. The United Nations Environmental Programme defines a green economy as one that results in ***improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities***. In its simplest expression, a green economy is one which is characteristically low carbon, resource efficient and socially inclusive; in which an improved, sustained and enhanced standard of living is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes. The development path of a green economy is characterized by the maintenance, enhancement and the rebuilding of natural environmental resources (capital) as a critical economic assets and as a source of public benefits, especially for poor people whose livelihoods and security depend on nature (UNEP, 2011b: 2).

The conceptual framework for decoupling and understanding the instrumentalities for achieving it are still in an infant stage; and has been applied to a very wide variety of subjects ranging from electronics to physical cosmology to linear algebra (UNEP, 2011: xi, xii). In this Report, our concern is using fewer resources per unit of economic output and reducing the environmental impact of any resources that are used or economic activities that are undertaken. More specifically, the resources that of interest are biomass and non-timber forest products.

As should have become clear from its definition and content, decoupling and green economy require such enabling conditions as the appropriate and significant changes in national regulations, policies, subsidies and incentives, and international market and legal infrastructure and trade and aid protocols, corporate behaviour, and consumption patterns and habits by the public (UNEP, 2011a: 5 and UNEP, 2011b: 2). However, the experiences in China, German, Japan and South Africa have shown that decoupling is not only achievable, but that indeed, the governments of these countries appear to be making reasonable headway with conscious efforts to stimulate it.

According to UNEP (2011: 3) the caveat, therefore, is that there is a need to establish new enabling conditions to promote the transition to a green economy, and this is where urgent action is required of policy makers. It is, therefore, recommended that the governments of the nine states in the Niger Delta Region, the authorities of the Niger Delta Development Commission (NDDC) and the Ministry of Niger Delta Affairs, should, as a matter of urgency, set up structures and

articulate programmes and policies towards resource and impact decoupling in the Niger Delta Region. Some of the issues and instrumentalities relevant to the decoupling of natural resource utilization and environmental impact from livelihoods, on the one hand, and the green economy, on the other, are explored below.

Bringing the State In and Mainstreaming Gender

As Ellis (1999) has rightly observed, reforms in the sense of responsive governance are, and will continue to be an unfinished business in the rural areas of low income countries, because a robust and an enabling and facilitating environment for the meaningful involvement of women in resolving the issues that challenge their livelihoods, can hardly be said to exist.

However, over the last decade, the government of the Federal Republic of Nigeria has instituted and implemented an impressive affirmative approach to gendered policy items; raising the profile of gender issues in legislative and policy circles, and creating and or enlarging the space for the participation of women in public life. The current over thirty per cent of women as political appointees, is novel, considered impressive and may even be said to be revolutionary. In fact, among those women who feel that their lives have improved over the last decade, the majority would attribute the improvement to the government's platform on gender issues. These women are, however, in the minority and invariably belong to the political elite, the very rich, and the well-connected and mostly urban dwellers. Moreover, they do not have the cognate knowledge needed for reducing (decoupling) the resources such as water or biomass energy used to produce and or sustain livelihoods. They, therefore, lack the knowledge base needed to delink livelihood sustainability from environmental deterioration and resource scarcity. The women empowered so far are not core to the envisaged green economy.

The real victims of the gender-environment-livelihoods nexus are thus, still marginalized, alienated, sidelined and remain disadvantaged. In other words, gender asymmetry continues to exist and could in fact be expected to widen, unless and until the constraints that circumscribe the average woman's capacity to pursue different livelihood strategies and protect such strategies are institutionally removed; and the provision and protection of unfettered or enhanced access to development resources are enshrined in the appropriate policies. It is only in such a scenario that the decoupling of natural resource use and environmental impacts from women's livelihoods can be achieved and a green economy can be grown and sustained.

Kabeer and Anh (2000) have categorized gendered constraints into three as follows:

- ***Gender specific constraints:*** These are those that stem from the specific nature of gender relations themselves, such as the inter-

relationship between reproductive and productive spheres. For instance, a nursing mother is temporarily constrained from participating in certain normal productive activities.

- ***Gender intensified constraints:*** These are those that reflect the uneven and often inequitable distribution of resources between men and women. Such asymmetries include cultural and religious conventions; and the social rules and norms that regulate property rights; inheritance practices; and resource endowments. Gender-intensified constraints may not always be gender specific but they often affect women more seriously than men. They include access to natural capital, especially land; and financial capital.

- ***Gender imposed constraints:*** These consist of disadvantages that result from the biases and partialities of those individuals who have the authority and power to allocate resources, including policy areas such as the provision of credit, product market information, and agricultural extension. The progressive argument is that since these constraints are imposed, they could, by implication, be removed because they are amenable to changes, through culture or policy. For instance, while boys stay at home after school to do their assignments, the girls are searching for water and fire wood, with obvious implications for their academic performance and eventual educational attainment and competitiveness in the market place of work.

With particular reference to decisions on the management of forest resources, which are major gendered environmental assets, WWF-UK (2012) has presented a composite picture of the gendered constraints in forest resources management in India as follows:

> The lack of participation by women greatly reduced their opportunity to share information and knowledge and voice their opinions. So, any activities could negatively impact on both women and their use of the environment. In addition, women's concerns were not heard at Village Forest Committee (VFC) meetings, due mainly to the fact that the timing of the meetings was decided by men (***an imposed constraint***). Even when women were physically present at meetings their views were not heard (***an intensified constraint***). Women are interested in ensuring increased and sustained availability of Non-Timber Forest Products (NTFPs), and men are generally interested in maximising monetary returns (***a specific constraint***). But during meetings, only men's

> opinions are heard and adhered to (***an intensified constraint***). The limited involvement of women also meant that the choice of species for planting in Joint Forest Management (JFM) areas was often decided by men, who chose cash profits over fuel and fodder yields (***an imposed constraint***). This reduced women's involvement and interest in the sustainable management of forest resources (emphasis, mine).

This scenario can be replicated for virtually all the communities, not only in the Niger Delta Region, but indeed throughout Nigeria. In other words, while the legal situation of women has dramatically improved since the redrafting of the 1999 Constitution, the vast majority of the poor rural and poor urban women who are caught in the poverty trap, and are constrained to continue to depend on nature, the environment and environmental resources, have been sidelined and completely excluded due to gender-specific, gender-intensified and gender-imposed constraints.

Thus, when Amnesty International (2009) quoted the United Nations Committee on Economic, Social and Cultural Rights as recommending that:

> The right of individuals and groups to participate in decision-making processes that may affect their exercise of the right to water must be an integral part of any policy, programme or strategy concerning water. Individuals and groups should be given full and equal access to information concerning water, water services and the environment, held by public authorities or third parties,

It was the mainstreaming of women that was implied and envisaged. This is because it is women, either as individuals and or groups, whose burdens are increased by the circumscription of the right to participation in the decision making processes that affect their right to water. Furthermore, participatory decision-making recommended by the United Nations should be extended to the management of all environmental resources other than water, particularly: fire wood and all non-timber forest products.

Indeed, from the particular view of gender asymmetry, Nazneen (2010) has argued that gender-sensitive governance reforms are crucial for improving government responsiveness towards women's livelihood activities. This requires institutional and legal changes, which should eventually clearly manifest in diverse aspects of what is widely documented in the literature as gender mainstreaming.

It is against the background of this envisaged inclusive participatory framework that gender mainstreaming has been defined as the process of

assessing the implications for women and men of any planned action, including legislation, policies and programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences integral dimensions in the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit maximally and equally, so that inequality is not perpetuated. The ultimate goal of gender mainstreaming is gender equality (UN ECOSOC Definition, 1997; adapted from The Sixth African Development Forum (ADF VI), (2008).

The irreducible minimum requirements or attributes of gender mainstreaming, within the context of the gender-environment-livelihoods nexus, should include the:

- enactment of responsive and progressive laws;
- establishment of state programmes, based on such laws;
- provision and protection of women's access to critical environmental resources and livelihoods, such as biomass and non-wood, non-forest, non-timber forest products;
- provision of information, credit and access to input, produce, product markets to rural women (and women's groups);
- access to markets (input and produce), both as buyers and sellers,
- securing of market information about what is in demand, so as to add value to their products;
- development of capacity, to help these women micro-entrepreneurs in building the voice which is a key area for promoting gender equality in various arenas related to rural livelihoods; and
- ultimate opening up of formal policy spaces for actors who can give voice to rural women's livelihood needs (Modified from Nazneen, 2010).

With these, gender mainstreaming equips women with *agency* (that is, the ability to define one's goals and act upon them), awareness of gendered power structures, self-esteem and self-confidence (Kabeer, 2001).These are the real ingredients of women empowerment which has been defined as the processes by which women take control and ownership of their lives through the expansion of their choices and operational spaces (UN, 2001). Gender mainstreaming is the process of acquiring the ability and capacity to make strategic life choices in a context where this ability has previously been denied. Sudan (2007) has cited UNDP (2001) as asserting that as long as the environmentally disadvantaged (which in the Niger Delta Region are invariably the women), suffer from economic deprivation and livelihood insecurity, they will not be in a position to mobilize and escape and break away from the poverty trap. This is because women entrepreneurs in the Niger Delta Region own small-scale (micro) enterprises, and often face high risks and low capacity for market integration.

The overriding goal of gender mainstreaming, therefore, is to provide a way and an environment for women to escape poverty and lighten their burdens through their genuine and sustained involvement in the management of the environmental resources that determine their livelihoods, and ultimately their relevance to the household economy.

Diversification of Rural Livelihoods

The economic base of the Niger Delta Region is presently very narrow, vulnerable and incapable of sustaining, on a long term basis, the livelihoods of the rural poor. It is unsustainable because it is a mono-economy, based almost virtually on oil and gas. Because these are non-renewable natural resources and are exploited from the same environment that the rural poor depend on for their livelihoods, there has been an unresolved conflict with, and an unfair squeeze by the transnational oil companies. The losers in this squeeze are, of the course, the poor, whose only source of livelihood, namely; the environment is over run and destroyed. They lose their lands, waters, and crops and other gifts of nature embedded in the forests. The mono-economy of the region has circumscribed the livelihood choices of the poor. This is even more worrisome when it is recognized that in spite of rapid urbanization, the physical environment of the region will compel the vast majority of the increasing population to continue to live in rural communities.

A diversification of the economic base is not only necessary but in fact urgent in order to expand the survival opportunities and livelihood space of the poor and especially the women. An alternative structure, based on the region's other sustainable resources that are presently in their primordial or primitive states must be urgently explored and pursued to leverage on its abundant renewable natural resource endowment. Indeed, the UNDP (2007) has strongly recommended that one of the sustainable ways to provide sustainable livelihoods especially for the rural poor of the Niger Delta Region is to diversify its economic base.

Ellis (1998; 4) has defined rural livelihood diversification as 'the process by which households construct ***a diverse portfolio of activities and social support capabilities*** for survival in order to improve their standard of living', arguing that having alternatives for income generation can make the difference between minimally viable livelihoods and destitution.

The concept of livelihood diversification is emerging as a survival strategy of rural households, particularly in developing countries (Ellis, 2000), because the behavior and tendency for rural households to engage in multiple occupations is almost always linked in a systematic way to rural poverty reduction efforts. This is because rural people, some of them pushed to the very limit of their survival, are looking for diverse alternative opportunities to increase and stabilize their incomes, which are

determined by their portfolio of assets, which include social, human, financial, natural and physical capital (Ellis, 1999).

Given the exigencies of rural living, Barrett, Reardon and Webb (2001) have asserted that diversification in fact, tends to be the norm, rather than the exception. This is so because very few rural people collect all their means of survival or incomes from any one source or hold all their wealth in the form of any single asset, or deploy all their assets in just one activity. They argue that the diversification of livelihoods is a form of self-insurance, and relatedly, but quite distinctly plays the role of helping to cope *ex post* with the shocks to normal income (Barrett, Reardon and Webb, 2001: 11, 12).In other words, diversification contributes positively to livelihood sustainability because it reduces proneness or vulnerability to uncertainties, stress and shocks, particularly where people depend on very sensitive environments, such as obtains in the Niger Delta Region.

From the evaluation of the recovery efforts in Gujarat, India, after the earthquake of 2001, it has become clearer that although policy makers often tend to concentrate on the distribution of relief materials in the event of disasters and shocks, in the long run, the affected people are more concerned and interested in the need to restore their livelihoods. Indeed, in the long run people become frustrated if assistance stops only at the level of short-term relief efforts (Humanitarian Initiatives UK, 2001). In the Niger Delta Region, for instance, where disasters such as oil spills and coastal floods have literally become part of the life of the people, assistance should not be limited to the sharing of relief materials, as often done by the National Emergency Management Agency (NEMA) and the regional counterparts, the State Emergency Management Agencies (SEMAs) or their affiliates, on the one hand, and the payment of compensations, on the other; no matter how generous these may be.

Amnesty International (2009) has presented a practical real life case of an inadequate response to a particular case of environmental stress, in the Niger Delta Region, as follows:

> On 25 June 2001 residents of Ogbodo in Rivers State heard a loud noise, which sounded like an explosion. The sound came from a pipeline, which had ruptured. Crude oil from the pipe spilled over the surrounding land and waterways. The community notified Shell Petroleum Development Company (SPDC) the following day; however, it was not until several days later that a contractor working for SPDC came to the site to deal with the oil spill. The oil subsequently caught fire (there are conflicting reports about the cause of the fire; it is not clear if the community

> or the SPDC contractor set the oil alight).
>
> Some 42 communities were affected by the Ogbodo spill as the oil moved through the water system. The communities' water supply, which came from the local waterway, was contaminated. SPDC brought ten 500-litre plastic tanks of water to Ogbodo, but only after several days. Although SPDC refilled the tanks every two to three days, the community claimed that ten tanks were insufficient for their needs, and emptied within hours of refilling. Local NGOs that visited the site confirmed that the community did not have enough water for drinking, cooking and washing (Amnesty International, 2009: 21, 22).

The compensation scheme applied in the event of damages and or losses arising from oil spills and other activities associated with oil and gas exploration and exploitation have also been severely criticised because of their tendency to be unfair, myopic and oblivious of the long term implications of the damages caused and the long term losses that are accruable. Again, Amnesty International (2009: 31) presents a scenario below:

> In numerous cases, the long-term effects of oil spills on the soil have resulted in undermining a family's only source of livelihood. Communities report long-term effects that include delayed germination of plants, stunted growth in trees and smaller fruit, and, in some cases, land is rendered unusable for years or even decades. These longer-term impacts are rarely considered in compensation deals; rather, people are compensated for the loss of the crop in the ground and not the long-term reduction in agricultural productivity. There have been some prominent cases, such as the Bomu Well II blowout, where an oil spill rendered agricultural land unusable for almost two decades, but where compensation was paid only for the loss of the crops and economic trees on the land at the time of the incident

The point is that although at the critical phase of livelihood intervention, livelihood provisioning activities such as the distribution of relief materials are essential, policy efforts should be made to restore, promote and insure the livelihoods of the people.

ISDR (nd: 8) has defined ***livelihood promotion*** as a set of development-based interventions that involve improving the resilience of household livelihoods so

that food and other basic needs can be met on a sustainable basis. It is a transition from short term recovery and provisioning actions and activities to long term development goals. It requires the long term and sustained commitment of governments and other relevant actors. Indeed, livelihood diversification is one of the best and surest ways to guarantee that interventions develop beyond mere recovery of vulnerable people and communities from environmental shocks and stresses, to the restoration and expansion of their resources to ensure sustainable development, on a long term basis.

Investigations by Barrett, Reardon and Webb (2001) reveal that generally, individuals and households in rural areas are prompted and motivated to seek to diversify their livelihoods, assets, incomes and activities by a number of factors. These factors have been grouped into two, namely: push factors and pull factors.

- The ***push factors*** include: risk reduction, response to diminishing factor returns in any given use, such as decline in the size and quality of fish catch, in the face of polluted fishing ponds and streams, and the deterioration of the quality of non-timber forest products due to the degradation of forests resulting from uncontrolled illegal logging, among others.

- The ***pull factors***, on the other hand, include: realization of strategic complementarities and 'partnerships' between and among activities, such as strategic partnership between NTFP collectors, on the one hand, and traditional medicine practitioners and vendors, on the other, among others.

Barrett, Reardon and Webb (2001: 15) hinge their support for diversification of livelihoods as a strategy for lifting the rural poor, especially the women out of drudgery and poverty, on the finding of a positive linkage and indeed, an apparent empirical regularity of a positive association between non-farm income, on the one hand and aggregate income or other welfare indicators, on the other, in rural Africa; an observation which is relevant and applicable to the Niger Delta Region.

However, in the past, efforts at diversification had been almost always limited to the agricultural sector. While such efforts may be well-intentioned, it must be recognized that, given the present cultural and traditional norms and practices which limit and even prevent women from accessing land, such diversifications may be of equally limited gain to women, because of their institutionalized lack of access to natural capital, particularly land. It would, therefore, be necessary to re-visit some of our traditional norms and the obnoxious Land Use Act of 1978, among other things, to auspiciously liberalize access to land.

In the Niger Delta Region, the collection of non-timber forest products constitutes an area where the

'supremacy' of women is not overtly challenged. Collectively they constitute the bulk of rural assets from which household food and fuel, as well as incomes are earned to supplement the livelihoods for the poor rural women and the household economies of the area. Logically, therefore, a policy that institutionalizes these activities could be a guaranteed way of ensuring the diversification of rural livelihoods, reducing the drudgery of rural living, generally, and lessening the burden on women, in particular. Thus, the diversity of livelihoods should be an important feature of survival of the poor women in the rural areas of the Niger Delta Region; unfortunately this fact is often overlooked by the architects of policy.

It is within this context that Turner, Hyden and Kates (1993) have highlighted the importance of earnings from non-farm activities, because as Sudan (2007) has argued, the diversification of non-farm agricultural livelihood activities is of increasing importance for, and very relevant to, women empowerment. This is particularly so, because, as Ellis (1999) has argued women typically confront a narrower range of labour markets and lower wage rates than men. In general, therefore, diversification is more of an option for rural men than for women. For women, it is a necessary but missing gap. Furthermore, it has been demonstrated that non-farm diversification tends to improve the independent income-generating capabilities of women; and in so doing, also improve the care and nutritional status of their children, since a high proportion of the disposable income in the hands of women almost always tends to be spent on family welfare. However, for this to occur, diversification activities will have to be promoted in the rural areas where they will be accessible to the majority of poor women. This means that such projects must satisfy at least two requirements, namely:

- ♣ location close to sites of residence (rural communities), and
- ♣ design to correspond with types of work to which women have equal or better access skills and experiences than men.

In emphasizing and amplifying these requirements, Ellis (1999) has advised that livelihood diversification must be ***deliberately targeted***. The purpose of targeting is to provide safety-net and support for those rural social groups that are most vulnerable to 'shocks' and 'stresses' that could lead to insufficient resources, and consequently put their survival at very great risk. In other words, indicator targeting works by identifying the social groups (such as poor, rural women in the Niger Delta Region) thought most likely to require support, in the event of environmental uncertainty and vulnerability.

Furthermore, in designing and locating livelihood diversification projects, it must be recognized that physical remoteness tends to be typically associated with greater poverty and fewer livelihood options. Consequently, it is advisable to target remote locations

rather than those places already well integrated into diverse economic activities (Ellis, 1999). This makes livelihood diversification projects even more suited for the communities in the Niger Delta Region which are characteristically rural and remote, with less than one per cent of the over 13,300 communities being urban. In addition, the Region is mostly riverine with isolated village communities which depend on the forest and natural environmental resources.

Cultivation of Biomass as Pro-Poor Energy Security

A pro-poor energy policy would be one way of alleviating the burden that the gender-environment-livelihood nexus places on women. A pro-poor energy security solution is one that protects our forest resources, while also preventing the competition between agriculture (food production) and the demand for wood fuel. It is, therefore, the one that secures and guarantees the supply of biomass to the poor, while not jeopardizing the portfolio of his sources of income and food. It is the one that is also pro-green economy. According to the UNEP (2011b: 12), addressing energy poverty is a very important part of the move from the current unsustainable 'brown economy' towards a green economy. This is because increased access to services and infrastructure as a means of alleviating poverty and improving overall quality of life depends on a satisfactory resolution of the energy poverty.Pro-poor energy security or the sustainability of biomass supply implies that the biomass resources are utilised without degrading the environment or having negative socio-economic impacts. It must, therefore, be ecologically viable, socially desirable and economically feasible. It must be capable of achieving resource decoupling.

One way that governments can achieve this win-win food-energy strategy, is to deliberately cultivate ***energy crops.*** Energy crops are the crops that are planted specifically for the purpose of producing energy, including short rotation coppice willow and *miscanthus,* commonly known as elephant grass. Since the start of the United Kingdom's Energy Crop Scheme in 2000, thousands of hectares of *miscanthus* and other short rotation coppice crops have been planted in the United Kingdom alone and there is great potential to increase this.

A deliberate energy crop cultivation programme will, among other things accelerate the rate of replacement of consumed biomass, provide an additional source of income, and bring collateral compensation in the forms of afforestation or reforestation, restoration of soil fertility, elimination or reduction of soil erosion, enlargement of the global carbon sink and enhancement of the carbon sequestration processes, thereby reducing the green house gasses released into the atmosphere. Ultimately, the environment would be sustained and its degradation reduced and eventually prevented and impact decoupling achieved. As a matter of policy, the proposed energy crop

cultivation programme could be integrated into the present ritualistic annual tree planting programme. It must, however, be ensured that it is taken significantly above the current level of official ceremonies.

The cultivation of energy crops is considered central to tinkering with the liberation of women from the brunt of the mismanagement of environmental resources, usually by men, who in the process of trying to earn cash, destroy nature, even when such unsustainable men-dominated activities create hardship for women folk and ultimately for their entire households (Yadav, nd). Men tend to be oblivious of MacCormack's (1980) ecofeminist argument that any harm done to nature equals harm done to women because of the pervasive perception that women are closest to nature.

The fear has, however, often been expressed that investment in energy crops in response to the current increasing use of biomass for energy purposes could conflict with food production. This is the so-called ***food versus fuel debate.*** The debate is that if excessive land is utilised for producing wood fuel feedstock, there could be competition for land for food crops, resulting in increased food prices, thus negatively affecting the world's poorest, which mostly use biomass fuels. But there appears to be enough evidence to show that this need not necessarily be the case. For example, the biomass sourced by the DraxGroup (UK) is typically agricultural residues, such as straw, forestry residues, such as tree tops and bark, and energy crops grown on marginal land, none of which competes with, or displaces food crop production (Drax, 1996).

In the process of the continuing interrogation of the subject, it has been variously argued that the 'food-versus-biomass fuel' debate has rather been too simplistic. This because a rigorous evaluation of the effect of biomass for fuel on socio-economics is complicated by the fact that increased price of agricultural (food) products can actually also benefit farmers who comprise a large portion of the world's poor. In fact, the anticipated positive effect on the rural economy and employment generation are two of the major areas for promotion of energy crop cultivation and biomass fuel utilization in many countries. Another major concern is the conversion of lands rich in biodiversity to monoculture energy crop plantations. Again, here, there is the contending argument that biomass could be planted on degraded land which cannot be used for cultivation of food crops. This would help restore soil organic matter and nutrient content, stabilize erosion and improve moisture conditions (Johansson and Azar, 2007). In fact, it has even been argued that using surplus or redundant agricultural land for biomass fuel production is more advantageous for greenhouse gas reduction than afforestation (Schlamadinger and Marland, 1998).In other words, with proper planning and management, energy crops and food crops can be, and have indeed been, cultivated together. When energy crops are cultivated with food crops it is

called ***agro-forestry*** (Bringezu, *et al*, 2007). Successful biomass cultivation projects have been recorded in Cameroon (Figure 15)

Figure15: An Agro-forestry Project in the Libialem Region of Cameroon. The concern and interest of women is reflected in the picture on the right

Source: Google images: globalgiving.org

Three decades of work by the Nairobi-based World Agroforestry Centre (WAC) has turned what was a traditional practice (growing trees and shrubs alongside crops) into a science-based discipline. The science of Agroforestry is now recognized around the world for its potential to provide food, fodder, increase crop yields and incomes, protect watersheds, provide biomass energy, prevent land degradation, and more. The International Development and Research Centre (IDRC) was a prime mover in the centre's creation. We do not need to re-invent the wheel to deal with the burden of the rural poor women that has arisen from the fire wood crisis of the Niger Delta Region.

If resource decoupling has been argued to be particularly relevant whena specific resource is scarce and its further depletion could frustrate societal progress (UNEP, 2010a; UNEP, 2010b) then the cultivation of biomass fuels or energy crops is a potent strategy for decoupling natural resource use and environmental impacts from women's livelihoods. This is so because its utilization, especially with a more efficient biomass energy conversion technology, will now improve human well-being and social equity (by reducing the time and physical energy burden on women), while significantly reducing environmental risks and ecological scarcities, that are associated with unregulated and unsustainable exploitation of the fast depleting stock.

Furthermore, in terms of its 'economic sense', the UNEP (2011b: 7) has claimed that green economy modelling forecasts that investing a modest 0.03 per cent of GDP between 2011 and 2050 in private investment in reforestation, through agro-forestry, in general, and the cultivation of energy crops, in particular, could raise value added in the forest industry by more than 20 per cent, as compared to the *laissez faire* or 'business as usual' approach. In addition, part of its cost-effectiveness is that apart from the fact that it could boost formal employment in this sector, it could substantially increase the amount of carbon stored in forests, with its consequential huge savings in terms of the reduction of green house gases.

The Improved Biomass Cook Stove: Towards Resource Efficiency

Even if, and when, energy crop cultivation addresses the supply side of household cooking energy, the issue of the inefficient conversion of biomass into cooking energy also has to be pointedly addressed, on the demand side. Such a policy intervention is needed to protect women from the collateral damages of the gender-environment-livelihood nexus, especially in the light of the fact that the situation is not expected to change soon with regard to their economic strength.

In this regard, Modi, McDade, Lallement and Saghir's (2005: 48) have suggested a three-fold approach to tackling the energy need of the poor, and by implication, of dealing directly with the burden of women, namely;

- ♣ increasing efforts to develop and adopt the use of improved stoves,
- ♣ devising measures to reduce the adverse health impacts from cooking with biomass fuels, and
- ♣ articulating measures to increase sustainable biomass fuel production.

It is noteworthy that the last approach has just been addressed and furthermore that, critically, all three are linked and revolve around the first. This is so because improved stoves have the capacity to correspondingly improve the health of women by increasing the energy conversion rate and reducing the amount of harmful substances released. Furthermore, by reducing the quantity of wood fuel needed to produce a given amount of heat energy, improved stoves make the fire wood that is available go farther and hence become more sustainable. This eventually reduces the pressure on women and on forests and environmental resources.

Accordingly, it is proposed that ***the improved biomass cooking stove*** should be introduced, popularized and adopted, to replace the ubiquitous, inefficient three-stone open-air cook stove. The improved biomass cooking stove is a ***very good example*** of an efficient and improved mode of converting fuel wood or any biomass into household cooking energy. ***Its principles are basic, versatile and flexible, and very easily adaptable to local situations***. It must, however, be emphasized that in this Report, it is ***the technology*** and ***not necessarily the product*** that is recommended. The product only illustrates how the technology works

and demonstrates its advantages. Locally domesticated and customized products can be fabricated, aiming eventually at 100 per cent local content. A typical improved biomass cook stove is shown in Figure 16.

The technology combines air-intake with the fuel feed slot. It is made up of four components as follows:

- ***The Fuel Magazine***: into which the raw, unburned biomass fuel (e.g. wood or dried grass) is loaded, fed or placed, and from where it feeds into the combustion chamber,
- ***The Combustion Chamber***: located at the end of the fuel magazine, where the raw biomass fuel (wood, etc) is burned,
- ***The Chimney***: a vertical channel above the combustion chamber, to provide for the updraft of air needed to maintain the fire,
- ***The Heat Exchanger***: to transfer the heat to where it is needed, that is, the base of the cooking pot (en.wikipedia.org/wiki/Rocket stove).

There are several varieties of the improved biomass cook stove to choose from; ranging from those made of mud, burnt bricks to metal. They could be used indoors or outdoors; fixed or mobile. Samples are shown in Figures 17 to 21, to reflect the flexibility of materials and cooking locations.

biomass is burnt carbon is released into the atmosphere, but as sustainably sourced biomass is replanted and grows the whole process starts again with the new plants capturing CO2 as they grow. Thus, the use of biomass instead of fossil fuels actually mitigates global warming.

Figure 16: The Prototype Rocket Stove: an example of improved biomass energy conversion technology

Source: DuetscheGesellschaft fur TechnischeZusammenarbeit (GTZ), (2007: 6),

If the biomass fuel (e.g. wood) that is fed into the fuel magazine is thoroughly dried, the improved stove ensures almost, if not, complete combustion, thereby reducing (and possibly eliminating) the emission of suspended particulate matter as well as reducing (or eliminating) all the attendant smoke- or soot-triggered health risks.

Since none of the energy converted from the wood escapes or is lost, the stove saves all the converted energy, retains and maximizes heat, thereby, reducing waste and shortening cooking time. Reduced cooking time impliedly also reduces the biomass fuel (fire wood) needed to generate the energy required for a particular cooking. The reduction in the wood energy fed into the stove in turn, reduces the environmental pressures on vegetation and soils; reduction of green house gasses, among the other attributes listed earlier.

Recently, from a global perspective, Adeduntan and Olusola (2008) cited the United States Environmental Protection Agency (US EPA, 2003) as claiming that the carbon dioxide (CO2) emitted as a result of the conversion of wood into cooking fuel has no significant contribution to global warming, especially in rural areas where they most commonly sued. This is because the standing trees absorb CO2 from the atmosphere, store carbon in wood and release oxygen (O2) to the atmosphere. In other words, when

Potential benefits to women and the family

Perhaps the greatest benefit of adopting the improved biomass conversion technology is that it is capable of delivering in excess of fourteen times, but certainly not less than seven times as much heat energy as the traditional three-stone open air stove. The other benefits that recommend the improved biomass cooking may, therefore, be summarized to include:

- its affordability, because it could be made of 100 per cent local content,
- less time spent on gathering, since less biomass will now be needed,
- less money spent on buying wood, since less will now be needed,
- saved time could be channeled into other economically productive (income-earning) activities, and self development, such as education,
- saved money could be used to improve the general quality and standard of living,
- less smoke in the kitchen, since combustion is greatly enhanced,
- reduction or elimination of respiratory problems associated with smoke inhalation,
- less manure (animal dung) used as fuel means great gain to the soil,
- releasing more natural *in situ* fertilizer (agricultural residue) for agriculture,
- little initial cost, compared to most other kinds of cooking gadgets, since most, if not all the materials are locally sourced,
- improved hygiene, especially with models that raise the cooking process off the floor to a table or a platform,
- greatly enhanced safety: fewer burns than are associated with open flames;

- less chance of children falling into the fire or boiling pots, especially, if raised from the ground,
- if pots are securely set into the stove, less chance of children pulling them down on themselves,
- less fire incidents and associated collateral damages,
- enhanced cooking convenience: since stoves can be customized to, or placed at, any height and can have working space on the surface,
- the fire requires less attention, as stoves with damper control can be easier to tend (Aprovecho Institute, 1984; 12).

Figure 18: More efficient and healthier use of fuel wood (metal type, portable, indoor/outdoor); compared to Figure 13: a way of eliminating the collateral damage and the health burden on women.

Source: Duetsche Gesellschaft fur TechnischeZusammenarbeit (GTZ), (2007: 6).

Figure 19: More efficient and healthier use of fuel wood (clay type, fixed, indoor kitchen); compared to Figure13: a way of eliminating the collateral damage and the health burden on women.

Source: DuetscheGesellschaft fur TechnischeZusammenarbeit (GTZ), (2007: 8).

The good news is that the improved biomass cook stove has been successfully deployed in more than 100 projects in over 60 countries, including many in East and Southern Africa, especially Uganda, Ethiopia, Lesotho, Malawi, Mozambique, Tanzania and Zambia, and particularly in Rwanda, where it was used in mass cooking in large refugee camps (www.cd3wd.com/cd3wd_40/JF/425/20-228.pdf; www.aprovecho.org/; http://www.ashdenawards.org/winners/aprovecho).

Figure 20: More efficient and healthier use of fuel wood (burnt brick-type, fixed, indoor/outdoor, compare to Figure 13 a way of eliminating the collateral damage and the health burden on women.

Source: Wiskerke, (2009: 117).

The formal adoption of the improved biomass cook stove will achieve the triple objectives of: resource decoupling; impact decoupling; and a green economy. It will achieve resource decoupling because it will be a sort of dematerialization of household energy by using less material, namely: fire wood or biomass for the same economic output, namely: cooking and or heating. In other words, the improved biomass cook stove will result in resource decoupling due to an increase in the efficiency with which environmental resources are utilized. On the other hand, it will also result in impact decoupling because its increasing economic output of a better and more efficient conversion of biomass fuels means less harmful bye products such as smoke, soot and

Figure 21: More efficient and healthier use of fuel wood (clay type, mobile, outdoor); compared to Figure 13: a way of eliminating the collateral damage and the health burden on women.
Source: DuetscheGesellschaft fur TechnischeZusammenarbeit (GTZ), (2007: 12).

ashes, and ultimately, a reduction of negative environmental and health impacts. Finally, the advocated technology will encourage a green economy through:

- less environmental resources consumption;
- improved human well-being and social equity; and
- reduction of environmental risks and ecological scarcities;

particularly within the context of Chapple's (2008: 1) position that the green economy includes "products, processes, and services that reduce environmental impact or improve natural resource use".

Figure 22: More efficient and healthier use of fuel wood (mud type, fixed, outdoor); compared to Figure 13: a way of eliminating the collateral damage and the health burden on women.

Source: Wiskerke, (2009: 117)

Omuta (2011: 76) has, however, perceived that:

> "The most major envisaged barrier to the acceptance, adoption and subsequent penetration of the improved biomass energy use methods is the cost of fabricating and or buying the basic unit; the cook stove itself. If per capita incomes are not expected to rise appreciably soon, and poor households do not normally have the required collateral to grant them adequate access to orthodox bank facilities to help upgrade their economic status to make able to afford modern, clean energy and their sophisticated and expensive gadgets, then governments must set up structures to assist them to adopt the improved but cheaper alternative. In this regard, it is commonly complained that, compared

> to the international response to hunger, HIV/AIDS, dirty water, poor sanitation and malaria, energy use for cooking, especially from the point of view of the poor, has received very woeful funding support and political backing. Yet, considering the direct and indirect collateral environmental and human damages that traditional biomass energy consumption has caused and will continue to cause, the need for the urgent extension of funding assistance cannot be overemphasized, and is strongly advocated"

Consequently, Omuta (2011: 77) is of the opinion that one of the pro-poor strategies is to encourage the establishment of ***energy micro financing***. Microfinance institutions provide for poor households and village communities to mobilize and access the micro capital needed to make small energy investments by the managers of cooking in the home; the women. The envisaged energy micro financing should be targeted particularly at the women folk because as IEA (2006; 443) has observed, worldwide, four out of every five micro-borrowers (80 percent) are women. Because the amounts involved will usually be small, no collaterals will be needed and the repayment terms are envisaged to be very liberal, the envisaged micro financing will be attractive even in the rural areas, where energy poverty and biomass energy consumption are highest. Governments at all levels, non-governmental organizations (NGOs), community based organizations (CBOs) and international donor agencies should be encouraged to partner with households and village communities to address the perennial cooking energy needs of the rural and urban poor.

Domestication of Non-Timber Forest Products (NTFPs)

That, generally, non-timber forest products (NTFPs) are essentially a very critical niche for the poor, and that they are a major source of poverty alleviation, sustenance and livelihood to women in rural and forest communities, in particular, is no longer contestable. For instance, Obot (1997) has claimed that a study had revealed that the gross estimates of annual incomes from major non-timber forest products in Nigeria range from ₦48.7 million ($360, 740.74) in the mangrove ecozone to ₦26.7 million ($197,777.78) in the moist forest area. In the Southern Guinea and Sudan Savannah forest, the estimated incomes earned from non-timber forest products range from ₦62.2 million ($460, 740.74) to ₦117.6 million ($871, 111.11), respectively.

This is the reason why any effort directed at developing the NTFP sector will be of core importance to the reduction of extreme poverty and hunger; and eventually, the burden on women who depend rather overwhelmingly on them for their livelihoods (Pfund and Robinson, 2005: 14). In other words, considering that the

vast majority of the people who earn incomes from non-timber forest products are poor, and further considering that the vast majority of the poor are women, it, therefore, means that the sustainability of the NTFP economy is considered quite critical to both pro-poor and pro-women empowerment policies, on the one hand, and promoting and enhancing their livelihoods, on the other.

In this context, however, it has been observed that, world-wide, NTFPs have been collected under a variety of management regimes and options, ranging from the strictly wild harvested, to the semi-domesticated, and to the more intensively managed systems (Ahenkan and Boon 2011: 3), as follows:

- ***Wild non-timber forest products***
  These are those gathered from fallow, secondary forests or mature forests, with little or no transformation of the forest structure and ecosystem as a result of the extraction of NTFPs. Product regeneration and sustainability often depend on natural processes, and forests are left by and large to natural succession.

- ***Managed non-timber forest products***
  These are collected from forests that are partially transformed through treatment processes such as weeding or crown opening to facilitate the production and regeneration of preferred undergrowth species. They are the products of what Ros-Tonen, *et al*, (1995: 1998) call 'managed secondary forests and enriched forest', in Ahenkan and Boon (2011: 3). Such management processes encourage targeted species to regenerate through natural processes; as natural succession is allowed to operate. This allows for multiple uses of the forest, while maintaining relatively high biodiversity.

- ***Cultivated non-timber forest products***
  These are those that are deliberately planted as seeds or seedlings or breeding stocks; including grass-cutters and snails. For example, *Dacryodesedulis* (safou fruit) and *Irvingiagabonensis* ('bush mango') are NTFPs, which normally grow wild in natural forests but are also widely domesticated and cultivated, and in many areas; the majority of the fruits are harvested from cultivated trees. They are the products of what Shiva (1998) call 'domesticated land areas' (Ahenkan and Boon, 2011: 3).

Against this background, evidence has shown that in the Niger Delta Region, local people are losing access to valued plant and animal species either through over-exploitation and habitat destruction or both, or through the loss of access, as former harvesting areas are destroyed through several uncoordinated and largely illegal acts of male-induced environmental recklessness (such as logging, most of which is uncontrolled and illegal), with their attendant negative effects on the women.

In other words, it has become incontrovertible that the current practice of extraction of wild NTFPs from natural forests holds very little, if any, potential for improving the welfare of women, alleviating their poverty, reducing their burden and enhancing their livelihoods and contribution to household economies. Indeed, Ahenkan and Boon (2011: 7) have asserted that it is misleading to think that NTFPs can be collected indefinitely without proper management practices and domestication, to sustain their yield. This is another way of saying that if improved human well-being and social equity must be decoupled from the simultaneous achievement of significantly reducing environmental risks and ecological scarcities, non-timber forest products must be managed under domesticated programmes and regimes. Furthermore, such programmes contribute significantly to the achievement of a green economy through what the UNEP (2011b: 6) claims to be one of its key findings, namely; *the inextricable link between poverty eradication and better maintenance and conservation of the ecological commons, arising from the benefit flows from natural capital that are received directly by the poor.* Consequently, scholars have begun to suggest that the objective of sustaining and enhancing forest-based livelihoods of women through NTFPs can only be achieved through their domestication through deliberate cultivation and plantation, as has been done for fuel wood and fodder in India (UNDP, nd).

The issue here, therefore, is the need for a policy that facilitates the intensification of the management and domestication of non-timber forest products of forest origin, including: honey, mushrooms, snails, grass-cutters, medicinal and aromatic plants and fruits, among others. The sustainable contribution of NTFPs to poverty reduction and improvement of the livelihoods of women, and by extension, the achievement of millennium development goals 1 and 3 in particular, can best be assured through a process of gradual, programmed but sustained domestication of NTFPs in human-modified agro-forest types, as is being successfully practiced in the Cameroun (Figure 22).It is believed that a trend towards plantations of NTFPs offers a way of both conserving the resource base and expanding exports (Hossain, 2008: 8).

Among the advantages of a deliberate policy of non-timber forest products cultivation are that their intensified management and domestication are assured as important means of improving livelihood of the poor rural women, in particular and forest communities, in general, through, among others:

- higher yields,
- improved and more consistent quality,
- control over the timing of harvests,
- reduced pressure on wild and presumably endangered resources,
- decoupling of natural resources utilization and environmental impacts from women's livelihoods, and
- enhancing a green economy.

Figure 22: A Non-Timber Forest Product (NTFP) nursery in Olonrounti, Widikum, Cameroun, by the Community Initiative for Sustainable Development (COMISUD)

Source: Google images; cominsud.wordpress.com

However, Hossain (2008: 8) has argued that if these potentials must be optimized, the envisage policy must go beyond the plantation of non-timber forest products, to building on the existing knowledge base and activities of women producers in the relevant informal sectors. This can be done through the formation and strengthening of their own organizations (as is done with the processing and marketing of chewing stick in Ghana), to enable them directly access export markets. This is because women constitute the most important user group, collecting forest produce to meet sundry family subsistence needs. Consequently, sustainable forest management requires their active involvement.

It has, however, been observed also that if non-timber forest products are not processed locally by the collectors, the raw materials tend to yield low returns. Therefore, their contribution to an

enhanced livelihood may be limited. This is because, middlemen, who are usually not women, reap the gains, thereby offering little prospect for the poor women to accumulate the capital needed to escape the poverty trap and achieve the appropriate MDGs, especially 1 and 3.

For example, WWF-UK (2012: 13) has observed that in India, the women collecting gum in Gujarat got only one-third of the market price. The major part of the income from NTFPs goes to those who add value to them through processing. Consequently, WWF-UK (2012) has recommended that special policy efforts are necessary to help women establish and run NTFP-based micro enterprises. Such an approach is likely to benefit women by distributing benefits more equitably within communities and families and creating more incentives for increased interest in sustainable use of the forest, thereby facilitating their escape from the poverty trap.

Indeed, Marshall, Schreckenberg and Newton (2006) are of the opinion that special interventions by governments at all level: the commercial sector; Non-Governmental Organizations (NGOs); and donor agencies, are usually necessary if the domestication; and even more importantly, the commercialization of NTFP activities are to provide poor people, especially women, with a 'stepping stone' to lift them out of poverty on a sustained basis. Such interventions must, therefore, include organizing non-timber forest products collectors into producers' or marketing groups or cooperatives. It must also include, facilitating access to information (particularly product market information) and technological and economic resources. It is the considered opinion in this Report that without these processes and facilities, women have very little chance of increasing their control over, and returns from, the productive process, alleviating their poverty and reducing their burden.

Joint Forest Management (JFM)

In order to design and implement appropriate gender-friendly and pro-poor (agro) forestry programmes, it is essential to understand how important forests are to conservation and sustainability, as well as to rural livelihoods, as has been abundantly and severally demonstrated in this Report. It is against this background that WWF-UK (2012:1), has argued that forest management needs to recognise that forests are important to the poor, especially poor women. Although women mostly do not own land, they often use forest resources for subsistence, as safety nets and even to generate modest incomes. One of the strategies for mainstreaming and integrating women into the gender-environment-livelihoods nexus is to involve them in forest management. If the forest has been equated to the woman's store house, involvement is, therefore, means including women in the team that keeps an eye on the store house. And one way of giving expression to this is the setting up of joint forest management committees,

within a Joint Forest Management (JFM) structure.

Joint Forest Management Committees (JFMCs) or what has also been called Community-Based Forest Management (CBFM), (CPED, 2007; vii) are grassroots level institutions for conservation, protection and management of degraded forests. In Nigeria, these institutions are usually established within the context of the ***Ministry of Agriculture***. Community-based forest management structures can be justified by a number of factors, some of which have been mentioned. For the avoidance of doubt, and also for emphasis, they include that: poor rural women, particularly those living in settlements located in the fringe of forest areas overwhelmingly depend on its resources for their livelihoods; such women, therefore, have a tremendous stake in the health and productivity of natural resources both for meeting their basic needs of collecting non-timber forest products, fuel wood and fodder. Consequently, to improve and enhance the quality of life, women's participation should be the major objective of the JFMCs, as has been done in India since 1990 (UNDP, nd).

Joint Forest Management (JFM) is a concept of developing collaborative partnerships between fringe forest user groups, on the one hand, and the Forestry Department of the Ministry of Agriculture, on the other. It is envisaged that such partnerships will be driven by transparent gender inclusion, and built on the basis of *mutual gender trust, gender respect, gender equality* and jointly, but clearly defined roles and responsibilities with regard to forest protection and development, and the use of its resources.

As the government of the Republic of Turkey has argued, since women constitute a group both affected by, and affecting the environment, ensuring *equal participation* of women in environmental policies is necessary and important, also in terms of protecting women's human rights(Republic of Turkey, 2008: 11).

Nevertheless, in many countries, including Nigeria, the participation of women in the protection and management of the environment and the development, planning, execution and monitoring of policies pertaining to environmental resources, is not yet at the desired level. Among the very relevant and encouraging lessons that the experience in India has shown are that JFM projects have delivered increased and improved productivity, which in turn, resulted in increased collection of NFTPs and less collection time by women. Logically, these developments have led to an improvement in the standard of living, due to higher supplementary incomes arising both from direct sales and indirectly through the conversion of the time saved into other income-yielding ventures and personal development. Ultimately, women are empowered and they are consequently better able to fight extreme poverty and hunger. Furthermore, the gender gap is reduced.

The seeming successes of the Indian example, notwithstanding, it is believed that the full potentials of the JFM approach in ameliorating the livelihood challenges of rural women with respect to the management of NTFPs can only be realised if and when women are fully involved as proposed earlier through gender mainstreaming.

Consequently, in order to ensure the success of the JFM approach and ensure sustainable livelihoods in the, particularly in the rural areas of the Niger Delta Region, women's participation must be assured, and systematically and progressively improved. This could be achieved with increased awareness among women. Among other things, the envisaged increased awareness could be translated into participation in joint forest management projects by:

- ♣ involving women from the very beginning of the designing, formation and running of JFM programmes; and by maintaining constant and sustained dialogue with them through consultation,
- ♣ increasing awareness among women that it is their right, and in their own interest to participate, and that that it is one of the sure ways of ensuring the sustainability of their NTFP-dependent livelihoods,
- ♣ increasing the representation of women in joint forest management committees (JFMCs) and other meetings, such as at the village levels, so that their concerns are known and taken into account at all levels,
- ♣ identifying and employing eligible female extension workers with whom women could communicate, exchange ideas and share challenges more freely,
- ♣ forming all-women groups to allow women to voice their opinion, since culturally and traditionally, women may not be allowed and or may not feel free to participate actively in meetings in the presence of men (their husbands or fathers), and
- ♣ undertaking gender analysis when developing plans, in order to understand the different uses and the different dependence of women and men on forest products.

14. KEY POLICY OPTIONS AND ISSUES

Following from the platforms discussed above, the overriding proposition behind the policy options offered below is that ***it is possible to promote the well-being of the people of the Niger Delta Region, in general, and reduce the burden on the women in particular, on the one hand, while reducing and or conserving the use of environmental resources and negative environmental impacts, on the other***. In other words, sustainable livelihoods and environmental quality are not necessarily or invariably incompatible. The task before policy makers, therefore, is to try and resolve the seeming conflict between a sustainable economy that requires a reduction in resource use at all levels.

The challenge is to design a set of policies that, collectively, can lead to an increase in the efficiency with which environmental resources are utilized. Together, the policies should be able to increase economic output side-by-side with the minimization of negative impacts on resources and the environment. The policy reforms should be able to catalyze improved human well-being and social equity, while significantly reducing environmental risks and ecological insecurity and scarcities. The fundamental objective is using fewer resources per unit of economic output; or maximizing the economic output per unit of environmental resource input.

Consequently, the governments of the nine states in the Niger Delta Region, the management of the Niger Delta Development Commission (NDDC), as well as the Ministry of Niger Delta Affairs are encouraged to set up structures and package appropriate and responsive policies and programmes, that are capable of replicating the incipient successes being recorded in South Africa, China and Japan, which are confronting the mismatch between the intricacies of environmental resource use, on the one hand, and the drive for economic development, on the other, as currently being experienced in the Niger Delta. The following specific areas of policy reforms are consequently recommended.

Gender Mainstreaming

Perhaps the most important single policy issue in addressing the burden that environmental resource exploitation places on the livelihoods of women in the Niger Delta Region, as it is in other parts of Nigeria, is to provide for their integration into the decision making processes. This is the so-called gender mainstreaming (GM) campaign agenda. Gender mainstreaming is the *inclusive participatory process* within which all planned actions, legislation, polices and programmes are evaluated and assessed in terms of their differential implications for men and women; to the extent that women are not disadvantaged.

Accordingly:

- All levels of government are encouraged to enact responsive and progressive laws, by-laws and statutes, that adequately recognize and accommodate the unique place of women in the development of the region;
- As appropriate, such laws, by-laws and statutes are encouraged to establish gender-friendly programmes in the use of environmental resources, at federal, state and local levels;
- More specifically, they should:
  - guarantee the access of women to, and protect, their major livelihood assets, such as firewood, water resources, and non-timber forest products;
  - particularly provide for the transparent and sustained participation of women in the management of community forests, from which most of the livelihood assets are collected;

- ♣ provide information on credit and relevant inputs, as well as produce and product markets, especially to women in rural communities;
- ♣ guarantee access to, and protect, both input markets (as buyers) and output markets (as sellers);
- ♣ open up the policy and decision-making space, so as to give voice and agency to women, particularly, the vast majority that live in rural areas;

- Barriers to access to land and land resources, including water bodies and fishing grounds, should be removed and or liberalized, through the abrogation or appropriate review of the Land Use Act of 1978;
- Traditional norms and cultural practices, particularly as they relate to inheritance, should be liberalized to provide for, and accommodate women's right to environmental livelihood assets, such as land, fish farms and forest resources.

Sustainable Livelihood Interventions

The vulnerability of the livelihood assets and livelihood strategies of women in the Niger Delta Region invariably means that they are susceptible to constant disruptions due to environmental uncertainties. Addressing these perennial challenges calls for deliberate state interventions. Among the common forms of state intervention are: the payment of compensation and the distribution of relief materials, particularly in times of disasters, such as oil spillages and flooding. These interventions have often proved to be unguided, unfairness, unfair, unresponsive, arbitrary and short-sighted. Furthermore, they are unsustainable due to the pervading problems of corruption and lopsidedness in their implementations; and the fact that they are based only on short-term valuations and evaluation.

These shortcomings were recently manifested in the handling of the plight of the victims of the flooding of September, 2012, that affected the region and beyond. State interventions were limited to livelihood provisioning activities, namely; the distribution of relief materials such, as food, clothing and medication. In some cases, some token cash was shared. There were even rumours of the infiltration of some relief camps by non-victims. Furthermore, the state intervention activities were considered haphazard, disjointed, inadequate and unsustainable. Probably more importantly, they were considered incapable of delivering on the expectations of incapable of adequately and permanently rehabilitating and reintegrating the victims. By extension, they were considered incapable of restoring, strengthening and even expanding their damaged, disrupted and destroyed livelihood assets.

Consequently, to handle situations when and where the livelihoods of the people of the Niger Delta Region are disrupted or destroyed, there should be policies that empower and equip the various levels of government and their agencies to expand their intervention activities from the traditional and usual short-term recovery livelihood

provisioning, to long-term sustainable livelihood development goals that promote the total and sustainable rehabilitation and reintegration of victims.

The governments are, therefore, encouraged to design and implement policies and programmes that diversify the livelihood assets of the region and enlarge the livelihood portfolios of the people. The diversification of rural livelihoods and economic base serves as an insurance against the proneness of the vulnerable activities to disruptions and uncertainties.

The traditional starting point for livelihood diversification is the agricultural sector. However, considering the traditional barriers and encumbrances that women face in accessing land and land resources, it is recommended that:

- access to land and land resources, including water resources, should be liberalized by abrogating the obnoxious Land Use Act of 1978;
- at the cultural and traditional levels, the punitive, oppressive and discriminatory inheritance norms and practices should also be reviewed, modified and liberalized to enable women inherit land and land resources;
- the established 'supremacy' of women in the collection of non-timber forest products should be guaranteed and protected, as a way providing some security and sustainability for them;
- government should ensure that the proceeds of the Post-Flood Rehabilitation Committee, set up by the Federal Government, and similar structures set up at state levels, are judiciously used, not merely for the payment of cash compensations, but to rebuild, restore and, more importantly, expand the damaged livelihood assets and environmental infrastructure of affected victims. In doing this, the vulnerability of women must be taken into account, and the traditional and cultural biases must be dismantled.

Sustainable Pro-poor Energy Supply

The projected escalation of poverty and the corresponding increase in the demand for biomass in sub-Saharan Africa means an equally corresponding pressure on environmental resources, particularly to meet household energy needs. There is, therefore, the need for a pro-poor energy policy, so that the projected increase in the demand for biomass energy is met without further degradation of the already fragile environment. The direct beneficiaries of such the envisaged policy are the women, who invariably constitute the poorest of the poor; and because they are the providers of household energy as the 'hewers of wood'

Accordingly, the government is encouraged to design and implement an energy crop cultivation (agro-forestry) programme as a way of sustaining the energy supply that is already in the deficit; thereby meeting the biomass demand of women and reducing their

attendant burden. Energy crops are plants grown as a low cost and low maintenance harvest; used to make biofuels, or directly exploited for their energy content. Among the several collateral benefits of an energy crop cultivation policy are the:

- accelerated replacement of used-up biomass energy. This can be achieved by cultivating fast growing short-rotation crops. Some the common short-rotation energy crops currently in production include: energy corn and energy vegetables, such as maize (*Zea mays*), sugarcane (*Saccharum officinarum*), wheat, barley, and sugar beets, potatoes, and short-rotation plantations of poplar (*Populus* spp.), physic nut, a member of the family Euphorbiaceae *(Jatropha curcas)*, sycamore (*Platanus occidentalis*) and eucalyptus (*Eucalyptus* spp.), coppice willow and M*iscanthus Gigianteus* (elephant grass).
- generation of employment and provision of an additional source of income or wealth creation. This would address the issue of unemployment and poverty, thereby contributing to the achievement of millennium development goals 1 and 3.
- collateral environmental compensations that would flow from:
  - reforestation,
  - replenishment of soil fertility, particularly when and where marginal and degraded lands are used;
  - reduction or elimination or stabilization of soil erosion,
  - enlargement of the global carbon sink, and
  - enhancement of the carbon sequestration processes,
- projected valued-added on agro-forestry investment of almost 700 times.

Affordable and Efficient Biomass Energy Conversion Technology

While a deliberate biomass cultivation policy would meet the supply side of the energy challenge of the poor rural woman, a policy that promotes a more efficient technology for converting the biomass into household energy would complete the demand side. In this regard, it has been confirmed that the traditional three-stone open air cook stove is grossly inefficient, wasteful of scarce environmental resources (its maximum energy conversion rate is only 12 per cent) and injurious to human and environmental health.

Consequently, governments at all levels are encouraged to embrace a policy that introduces, popularizes and promotes the adoption of the improved biomass cook stove, as an interim household energy technology, while other more sophisticated and more efficient but presently less cost-effective options, such as ethanol, are being explored, fine-tuned and perfected. Among the advantages of the improved biomass cooking stove are that it:

- ❖ is cost-effective and affordable, because it can be made of 100 per cent local content;
- ❖ generates at least seven (7) times as much energy as the traditional technology, thereby increasing economic output per unit of environmental resource input;
- ❖ saves time and promotes social equity, by releasing valuable time for women to deploy in pursuing self-improvement and self-development endeavours, such as the uninterrupted education of girl children and earning supplementary incomes to sustain the household economy;
- ❖ is less injurious to human health, because of the more efficient conversion (almost complete combustion) processes; thereby reducing and possibly eliminating the suspended particulate matter that cause respiratory and cardiac problems, as well as skin and eye irritations;
- ❖ uses less environmental resources to produce a given amount of energy,
- ❖ reduces the environmental risks and ecological scarcities, often manifested in the forms of diminishing returns to environmental and ecological resource inputs;
- ❖ constitutes a great potential for wealth creation, by generating employment through the generation of the entrepreneurial capacity for small and medium scale enterprises, consequent upon the need for the mass production and commercialization of the technology and product;
- ❖ ultimately contributes directly to the achievement of millennium development goals 1, 3, 4, 5 and 7.

Sustainable Non-Timber Forest Products Husbandry

Although, collectively, non-timber forest products constitute the single most important livelihood asset of the vast majority of poor rural women in the Niger Delta Region, almost all of the NTFPs are gathered from the wild; from fallow plots, secondary forests or mature forests. Since they are largely unprotected and their exploitation is uncontrolled and unregulated, the NTFP portfolios are not only slim and vulnerable, but also unsustainable, due to the vagaries of nature, overexploitation and uncoordinated actions of other users of the environmental resources of the area. The implication is that the survival of women who depend overwhelmingly on these resources cannot be guaranteed, let alone sustained.

Consequently, the deliberate domestication and husbandry of non-timber forest products must be encouraged through policy intervention. The products that should be targeted by the envisaged policy are those common items that are historically the major sources of supplementary incomes or used for food, fodder, medicines, perfumes, colorants and cosmetics, in the region. They include, but by no means limited to: fruits, such as *Irvingia gabonensis* (bush mangos), *Dacryodes edulis* (safou fruit); honey; medicinal

and aromatic plants; grass-cutters; snails; mushrooms, among others.

The advantages of a policy that facilitates non-timber forest products husbandry include:

- ♣ general improvement of the welfare of women, by guaranteeing their livelihood assets;
- ♣ a diversified livelihood portfolio that also guarantees a predictable and steady source of income,
- ♣ reduction of extreme poverty through greater volume, and better quality of yields, and achievement of millennium development goals 1 and 3;
- ♣ reduction of pressure on environmental resources and achievement of millennium development goal 7;
- ♣ establishing the foundation for the formation of informal sector NTFP-based micro enterprises and cooperatives, especially if the policy also provides for the formation and support of cooperative societies for the processing and marketing of the products, among others.

15 SUMMARY AND CONCLUDING REMARKS

Historically, the strategic place of women in development has attracted interest in the literature for more than half a century. The conceptual approaches that have been deployed in the interrogation and investigations of this relationship have included those of the welfarist, human resource development, anti-poverty and empowerment. Most recently, particularly since the 1980s, however, the concept of ***gender*** has replaced 'women and development'. Gender has been generally understood to mean the social and cultural construct that differentiates women from men, and defines the way that women and men interact and relate to each other. Gender is culture specific. It is within this cultural specificity that this Report examines the gender-environment-livelihoods nexus in the Niger Delta Region of Nigeria.

That, the cultural and traditional roles allocated to women in the Niger Delta Region of Nigeria bring them in more direct and intimate relationship with natural environmental resources than men, is well-known and accepted. That, due to these roles and responsibilities, women depend more on natural environmental resources for their livelihoods than men is, therefore, only logical. That, as a result of these relationships, women tend to disproportionately bear the burdens and the brunt associated with acts of environmental mismanagement that negatively impact on their livelihoods, is also no longer in doubt. The cumulative effects of this syllogism is that women have become victims of all acts of environmental carelessness, callousness and irresponsibility. These burdens have arisen out of the gender allocation of the roles of provision of food, household energy, and the need to

supplement family incomes, particularly in rural areas, to women.

The Niger Delta Region has a naturally fragile, vulnerable, delicate and sensitive environment. Its natural resources that have sustained the local communities for generations include the rivers, streams and creeks, forests and non-timber forest products. However, the balance between man and nature is so precarious that even a slight, unguided or misguided interference could cause serious upsets, with grievous environmental consequences, which in turn have equally grievous consequences for the survival and livelihoods of the people. In a socio-cultural setting where women have no right to land ownership and they constitute the vast majority of the poor, they are compelled to depend almost exclusively on the fragile natural environment and its delicate resource base, from which they sustain themselves and their families, by collecting fuel wood, vegetables, herbs, roots, barks and medicinal plants, wrapping leaves, protein sources such as giant snails, among others; as well as generating supplementary incomes for the family.

However, as a result of its rich hydrocarbon resource endowment, the region has become home to unprecedented and unrelenting human activities for almost six decades. Consequently, its population has increased remarkably, due to the oil and gas and other related activities. As a result, the environment has been pushed to the point of manifesting signs of exceeding its natural carrying capacity. This is because, some of the activities of the oil and gas operators have massively altered the natural environment and its resources, such that some of the livelihood assets of the local rural poor communities have either been completely destroyed or greatly depleted. These have put a lot of pressure on survival; and women are left to bear the brunt as victims.

This Report, among other things, has documented some of the dimensions of the pressure that environmental irresponsibility has put on women through the destruction of selected livelihood assets. It was established that in a *laissez faire* situation, as is presently the case in the Niger Delta Region, there tends to be a conflict of interest between men's and women's use of forests; with the women always losing. For instance, men-dominated activities like uncontrolled timber harvesting, illegal logging, commercial wood harvesting and bush-burning for game hunting, tend to destroy these members of the forest. In the process, however, they cause collateral damages and also destroy and deplete the stock of other members of the same forest ecosystem that co-habit it with the ones that the men extract. For instance, the timber trees that men extract co-habit the ecosystem with *Irvingiagabonensis* (ogbono), oil been seeds, bread fruit (ukwa) and other fruits, which women traditionally harvest for food, livelihood and supplementary incomes. Consequently, men's activities frustrate efforts by women at reducing endemic

poverty and hunger and achieving MDGs 1 and 3.

Similarly, since there is no pipe-borne water in almost all rural areas, where there is no pipe borne water, women and girl children are culturally assigned the role and responsibility of fetching every litre of water for cooking, bathing, cleaning, maintaining health and hygiene and raising small domestic livestock like hens and goats. These tasks consume much of the time and energy of women and girl children. And when the sources of water are polluted, their burden is further increased, which involves spending more time and walking longer distances, some time through lonely bush paths. In such circumstances, the women and girls become victims as they are exposed to the risks of assault, rape and kidnapping, on the one hand, and attacks by reptiles, wild animals and insects, on the other.

Besides being the source of their domestic cooking fuel and heating energy, Niger Delta women depend overwhelmingly on forest resources for the collection of a wide variety of non-timber forest products (NFTFPs), which are a veritable source of supplementary incomes, food and employment. Indeed, there is a strong positive correlation between poverty levels and incomes from the forest. For instance, NTFPs are the major sources of income for more than two-thirds (67.2 percent) of the poorest twenty per cent (first quintile) of the residents of rural Niger Delta, compared to 63.6 per cent for the second quintile and 57 per cent for the third quintile. Furthermore, more than half of the total man/days of the poorest people are employed sourcing livelihood from the assets of the forests of the Niger Delta Region.

Collectively, these findings show that whatever negatively affects the environment and natural environmental resources of the region also correspondingly and directly negatively affects the livelihoods and survival of the women. One of these external causative factors is climate change. When climate change alters the environment and consequently, the livelihood assets and strategies of women, their efforts at eradicating extreme poverty and hunger will be frustrated. If climate change increases the work load of women, they may be compelled to enlist the assistance of their girl children, which will eventually translate to preventing such girls from either going to school at all, or completing their education. Also when climate change destroys the environmental resources on which women depend they are disempowered and the gap between them and men is further widened; frustrating the millennium development goal of gender equality. Since the poor depend more on traditional medicines from the medicinal plants sourced from the environment, it means that when climate change either destroys or depletes the stock of medicinal plants, the goals of reducing infant mortality and improving maternal health are jeopardized. And, of course, any external factor that affects the natural patterns of precipitation, floods and

droughts will affect symbiotic relationships and trophic chains, thereby, putting environmental sustainability in jeopardy.

The burdens that the gender-environment-livelihoods nexus places on the women point to some areas of policy intervention and reflect some policy deficits that need to be addressed. These gaps include the unmitigated depletion of common poor resources as a result of the seeming unresolved conflict between development (economic) and environment (ecology). Since, in a *laissez faire* situation, the ecology is the weaker party in the conflict, the environment is invariably at the short end. And women who are the tag-team partners of nature, are always the co-victims and co-losers.

One of the environment-based indicators of poverty is the type of energy used by households. In this regard, the (energy) poor are always located at the lower rungs of the energy ladder, occupied by biomass fuels (crop wastes, wood and charcoal), which are sourced directly from the environment. As population increases and the number of the poor correspondingly increases; and since the cost of modern, cleaner sources of energy, that occupy the upper rungs of the ladder (kerosene, gas, LGS and electricity) make them unaffordable, rising energy poverty will mean that the pressure on biomass fuels will continue to rise and the supply will correspondingly dwindle, in the absence of strong policy intervention.

One of the explanatory factors for the persistence of the burden that the gender-environment-livelihoods nexus places on women is their alienation or exclusion from the processes that produce the decisions that affect their use of environmental resources. However, over the years it has been argued that the continued marginalization an exclusion of women only robs the decision making process of perhaps the most valuable source of informed knowledge and practical experience base, needed to responsively tackle the gendered challenges of sustainable livelihoods and survival.

Consequently, modernization feminists have argued that since women's burdens are the result of culturally assigned and determined roles and responsibilities and since culture is dynamic, then these roles and responsibilities could also be changed. They have, therefore, called for a replacement of the old traditional values that that undervalue and circumscribe the contribution of women to the sustenance of the household, with modern values that appreciate the full economic contribution of women to the household economy.

More formally, the involvement of state and mainstreaming of gender has been canvassed. The major elements of gender mainstreaming include: opening up the policy space to generously accommodate women; enactment and implementation of responsive affirmative laws; provision and protection of women's access to environmental resources; provision of

information, credit and other inputs; access to markets and development of capacity; among others. One of the ways that gender mainstreaming has been given expression is through the establishment of joint forest management structures, which allow women to participate in the design, formation, and running of environmental resources programmes, such as the domestication and commercialization of non-timber forest products.

Meanwhile, as the processes for this desirable mainstreaming are being considered and pursued, in the interim, the narrow economic base of the Niger Delta Region should be broadened, through the diversification of rural livelihoods. Additionally, the cultivation of biomass fuels as a pro-poor energy security strategy, should be embarked upon. Also the adoption of improved biomass cooking stoves, made from 100 per cent local materials, should be considered as an institutionalized strategy for reducing the burden and mitigating some of the collateral health damages that the gender-environment nexus has foisted on women as the environmental scapegoat.

The product combines all the attributes required in the conversion of biomass energy to make them more environmentally friendly, by producing and retaining as much as fourteen times more heat from a given quantity of biomass as presents modes can produce. It is an affordable way of decoupling the resource and environmental impact of dependence of the poor on biomass fuels. It has been widely accepted and adopted for use in many developing nations, including some East and Southern African countries, and the results have been very impressive.

For instance, within two years of its introduction and adoption, the improved biomass cook stove has reached over 200,000 households, generated over 290 direct jobs, which in turn, generated incomes of about 261,000 Euros per annum, in Uganda. Furthermore, with the use of improved stove over 200,000 tons of wood are saved every year, which is the equivalent of spending almost eight million Euros in afforestation (GTZ, 2007). It, therefore, holds great prospects, especially a country like Nigeria that is under the pressure of a large and fast growing population. The Niger Delta Region, whose naturally fragile and vulnerable environmental resources have been put under the pressure of increasing population and intensive industrial activities in the oil and gas sectors, is a good place to consider the adoption of the improved technology of the more efficient cooking stoves. If the method is supported with an energy crop cultivation programme, it is capable of producing far greater results than has been the case in East and Southern Africa.

Perhaps most importantly, is the fact that if energy crops are successfully cultivated under an agro-forestry programme, thereby sustaining the supply of biomass, on the hand, and the improved biomass cook stove is simultaneously adopted, on the other

hand, we could improve the well being of women, side by side with a reduction in a wide range of environmental impacts. In other words, we would be decoupling natural resource use and environmental impacts from women's livelihoods. Furthermore, we would be contributing significantly to the achievement of the goal of replacing the current brown economy with a green economy.

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