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Environmental Insecurity and Erosion of Women Socio-economic Status in the Niger Delta, Nigeria

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Abstract:
The Niger Delta has been the hub of oil operations since 1958. Before the advent of oil, the people women mostly depended on the natural environment; fishing and farming for their livelihoods. However, oil operations in the region have been accompanied by unabated oil spillages and huge gas flares that have acutely despoiled the environment. The papers examine oil operations and environmental insecurity in the Niger Delta. The paper contends that oil operations have virtually stripped women of their known means of livelihoods, with no other alternative means of sustenance; leading to servile poverty. This has forced women into practices traditionally abhorred in the region for sustenance. The paper concludes that but for oil operations, women socio-economic status would not have been so adversely impacted and ingloriously diminished.

Keywords: *Environmental insecurity, women socio-economic status, Niger Delta*

1. Introduction

The Niger Delta is Africa's largest delta; with over ⅓ made-up of wetlands (Awosika, 1995). The total area is 25,640 km2, as follows; Low Land Area 7,400km2, Fresh Water Swamp 11,700 km2, Salt Water Swamp 5,400 km2 and Sand Barrier Islands 1,140 km2 (Ashton-Jones. 1998). These harbour natural environments of crucial ecological importance; rainforest, mangrove swamp forest that harbours many endemic species of diverse faunal and floral groups (Kingdom, 1990). Nigeria's mangrove forest ranked third largest in the world (FOS, 2004; NDHDR, 2006) has 95% (504, 800 hectares) are in the Niger Delta and 5.0% (95,000 hectares) in Akwa-Ibom state (NDDC, 1999; FOS, 2004). These forests due to their ecological functions and myriads resources medicines, fisheries, wood for fuel and shelter, tannins and dyes, and critical wildlife habitats, provide sustenance for sustaining local communities.

The definition of the Niger Delta has mutated over the years, due to vested interests. Originally, the Niger Delta is defined as the area bound by the Benin River in the West, Aboh, in the North, Imo River in the East and Palm Point Akasa in the South (Dike, 1956:19). The definition subsisted until 1999 (see Willink *et al*., 1958; Akinyele, 1998). The geographic co-ordinates are; Aboh 05^0 33´ 49" N; 06^0 31´ 37" E in the north and Palm Point 04^0 16´ 22" N; 06^0 05´ 27" E in the south; Benin River estuary 05^0 44' 11" N, 05^0 44´ 49" E and Imo River estuary 04^0 27´ 16" N, 05^0 35´ 27˝" E in the east (NDES, 1997). Based on the definition and geographic parameters above, the Niger Delta comprises of the present Delta, Bayelsa and Rivers States. However, in Part 1 Subsection 2(1), of the Niger Delta Development Commission (NDDC) Act 1999, the Niger Delta is politically defined as synonymous with the nine oil producing states of Nigeria[1]. The Niger Delta; labelled the heart and lungs of Nigeria (Saro-Wiwa, 1999:13-14), is Nigeria's oil enclave (De Montclos, 1994; Embassy of Nigeria, 2001). The region is endowed with substantial hydrocarbon deposits. Proven oil reserves as at January 2007 are estimated at 36.2 billion barrels (RWI, 2010) but (NNPC, 2009) put the figures at 40 billion barrels. Also, natural gas reserves estimated at 159 trillion cubic feet (Tcf) (NNPC, 2009), and 182 Tcf (RWI 2010) are present in the region. This explains why the region is regarded as the twelfth richest area in hydrocarbon resources world-wide (Klett *et al*., 1997). The region presently accounts for over 90% of onshore and about 85% of off-shore oil production and also hosts the massive oil fields, technological and administrative infrastructure of the oil industry.

The Niger Delta, besides its vast oil and gas deposits is also endowed with, fertile agricultural land, abundant rivers (as well as creeks) and fish, forest and human resources (Onosode, 2003). Indeed, the significance of the region dates back to the colonial era due to its very rich natural resources and its strategic location as a prominent commercial and export centre. The commercial activities involved the exchange of manila, tobacco, linen or woollen clothes and coral beads for ivory, hides and skin, palm oil, rubber, pepper. The major economic activities are farming and fishing are mixed with handicrafts; mat weaving, hand-dug boats, salt making and distillation of local gin.

According to World Bank (1995) the Niger Delta also, has other numerous economic tree species; mahogany (*khaya* sp), red mangrove (*rhizopora* sp), abura (*Hallea ledermanmi*), iroko (*Milicia excelsa*) and cotton tree (*Ceiba pentandra*). These species are commonly used for building poles, fuel wood, saw logs and transmission poles. Other common species in the Niger Delta are *Lophira alata*, *Pycnanthus angolensis*, *Ricinodendron heudelotii*, *Sacoglottis gabonensis*, *Uapaca* spp., *Hallea ledermannii*, *Albizia adianthi-folia*, *Irvingia gabonensis*, *Klainedoxa gabonensis*, *Treculia africana* and *Ficus vogeliana* (McGinley and Duffy, 2007).

The Niger Delta is very rich in aquatic resources with high diversity and abundance of over 200 species of fishes (Uluocha and Okeke, 2004; Ebeku, 2004; Nwadiaro, 1984; Fentiman, 1996; NDWC, 1995), in 36 families, 20 of which are endemic (WWF, 2006). The area has more species of freshwater fishes (197) than any other coastal ecosystem in West Africa (Powell, 1993; Ogbe, 2005; Brown, 2006). About 68% of the active labour force mostly women are engaged in one form of farming and fishing activity for economic purpose (Worgu, 2000; FOS, 1985). Wetland provide a cheap and common source of animal protein for most of its inhabitants (Chindah and Osumakpe, 2005; Davies *et al*., 2009). Studies have shown that about 16 species of the 200 species of fishes found in the Niger Delta are endemic to the region, with 29 others near endemic (Moffat and Linden, 1995; Ebeku, 2004; NDWC, 1995). However, incessant oil spills and huge gas flaring have been the bane of oil activities in the Niger Delta. This has caused acute physical and environmental changes that have impacted the region's ecological balance (Moffat and Linden 1995), resulting in habitats distortion and species depletion (Amakiri 2005). Women in the region depend heavily on the natural environment (agricultural activities) for their families' up-keep and income. Thus, the paper interrogates the nexus between oil activities and the environment and how this has impacted on women's status in the Niger Delta.

2. Conceptual Framework: Gender and the Environment

Human societies are structured around patterns that establish how social interactions are carried out. A vital social structure that organises social interaction is status – a position a person occupies that is a key indicator of how one is defined and treated. Statuses may be acquired by achievement, through one personal efforts, or by ascription (born into them), or attained involuntarily at some point in a life cycle. A person may simultaneously occupy a number of statuses, referred to as a status set; mother, daughter, lawyer, employer, and tenant. Compared to achieve statuses occurring later in life, ascribed statuses instantaneously impact virtually every aspect of our lives. The key ascribed statuses are gender, race, and social class. Status is simply a position within a social system, dissimilar to rank or prestige but determines a person's role. A role is the expected behaviour associated with a status. Roles are performed according to social norms, shared rules that guide people's behaviour in specific situations. In all societies, social norms determine privileges and responsibilities a status possesses. For example, statuses; males and females have different role requirements attached to them. As vital parts of social structure, statuses and roles organise our lives in consistent, predictable ways. In combination with accepted norms, they order our behaviour and ease interaction with people occupying diverse social statuses.

Agricultural activities constitute the dominant traditional economic activity in the Niger Delta. Poor households are often highly dependent on "common property resources" (CPRs); fallow fields, forests, fishing grounds for their livelihoods. These provide variety of goods; food, fodder, fuel, medicinal plants that are important sources of sustenance or income for the land-less, especially women (KFRI, 1980; Fernandes and Menon, 1987). CPRs are of vital importance for the poor mostly women, given their unequal access to land (GOI, 1986, 1987). FOS (1985) in a report stated that farming and fishing account for about 90% of all forms of women economic activities in the region. Studies show that outside the home, most women are unemployed as they lack education, as such, agricultural activities constitute their main source of income; women "comprise 60-80% of agricultural labour and supply 90% of family food needs (Weidemann, 1987; Rowell and Goodal, 1994; Picard, 1995:37). Women are the main breadwinner and they bear the burden of raising and nurturing their families. Apart from other gender-specific tasks performed by women, traditionally, they have a primary role of food production (Wuraola, 2001:109), spending over 70% of their time on this activity alone (UN-ECA, 2001). Educationally deprived, women rely on agriculture for family food and monetary needs amongst other forms of survival strategies (Weidemann 1987; Picard 1995; Moser 1996; Davies 1996b; UN-ECA, 2001). To provide for their families, women are often, collectors, end users and managers of ecosystem resources. For traditionally, it is women who provide and manage natural resources needed for the family's up keep. Thus, as resources users, distributors and conservers, women incessantly interact with the environment. Due to these functions, women have intimate knowledge of their ecosystems and a strong need for sustainable use of resources; failure increases their work burdens (Agarwal, 1994, 1997). The role of women in relation to the environment in the Niger Delta is vital due to their reliance on the environment for their families' socio-economic (income and food) needs. It is with regard to these needs, therefore, that impacts of oil activities on the environment have been mostly felt by women in the region. In sub-Saharan Africa agriculture has been identified especially, as, having substantial multiplier effects (Young, 1998; Haggblade *et. al*., 2007). Studies have shown that gender socialisation significantly influences individual behaviour very early in life, and these findings have been supported across cultures (Block, 1973; Williams and Best, 1990). The paper explains the nexus between oil activities and environmental insecurity Delta and its impact on women socio-economic status in the Niger.

3. Oil Activities and Livelihood Insecurity

Agriculture is the core activity of rural people (FAO, 2006); source of income and employment (World Bank, 2008; IFAD 2002), an antidote to environmentally induced conflicts and thus, among rural people, a source of peace (Messer, et *al*, 1998; de Soysa and Gleditsch, 1999; UNU-IAS Report, 2004; Addison, 2005). As a deltaic region with mostly rural population, agriculture is the basis of life sustenance in the region, especially women. To the Niger Delta people agriculture is an unbreakable source of life sustenance. Women in the Niger Delta mangrove forest ecosystem engage mainly in fishing and gathering of sea foods. A dense vegetation of mangroves in their marine and brackish habitats found along numerous rivers and creeks are also veritable 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 (Raphia vinifera), collection of African mango seeds, Ogbono (Irvingia gabonensis), snails, weaving of mats and other objects/items from screw pine (Pandus candelabrum), rattan palms and bulrushes respectively. In the mangrove and fresh water swamp systems women engage in farming, mainly for subsistence and depending on the availability of arable farmland. In the tropical rain forest, women's major economic activity is farming. Collection of snails and other non-timber products, weaving, fuel wood gathering, tapping of rubber trees, etc are other sources from which women generate revenue and derive their livelihood.

But despite its value, agriculture has been pitilessly plundered (Schiff and Valdes 1992). The Niger Delta is inhabited mostly by rural dwellers that depend solely on the natural environment for their sustenance and livelihoods (UNDP, 2006). The Nigerian state it seems, attaches more value to oil resources at the expense of agriculture. For instance, while crude oil input to Gross Domestic Product (GDP) rose from trivial 0.3% (1960), 7.1% (1970), 22.0% (1980), 12.8% (1990), 47.5% (2000) to 40.6% in 2002, the contribution of agriculture plunged from 64.1% (1960), 47.6% (1970), 30.8% (1980), 39.0% (1990), 35.7% (2000) to 28.35% in 2002 (Adedipe, 2004:1). Indeed, since then, oil has accounted for 80% of government revenues, 90% of foreign exchange earnings, 96% of export revenues (Karl and Gray, 2003:26; Powell *et al*., 2005:9; ICG, 2006b:19; Watts, 2008). The deplorable situation of agriculture has been attributed mostly to the adverse impacts of oil operations on the environment. Oil operations in the Niger Delta have involved unabated oil spillages. As, UNDP (2006:181) reported, over 3 million barrels of crude oil were spilled in 6,817 incidences from 1976-2001, with over 70% of the oil spilled unrecovered. Also, Department of Petroleum Resources (DPR) data showed that between 1976 and 2005, over 3, 121, 909.8 barrels of crude oil were spilled in about 9,107 incidents in the region (Egberongbe *et al*., 2006; Emuedo, 2010). Of the quantity of the oil spilt, (77%) was lost to the environment, while only 23.17% was recovered. However, various writers consider the volume and records of oil spills in the Niger Delta highly under reported (see Green Peace 1994; Dublin-Green *et al*. 1998, Grevy, 1995, Iyayi, 2004).

Oil has devastating and long lasting negative impacts on the environment; oil impacted areas are unsuitable for farming even after two decades (Ekekwe, 1983). Pollution impacts have been more severe because clean ups are often tardy and limited (Kemedi, 2005). Indeed, the effect of oil pollution on the environment in general and agriculture in particular in the Niger Delta, have been reported by many studies (Amakiri and Onofeghara, 1984**;** Ayodele 1985; Ibeanu 1997; Obi, 1999; Ekundayo *et al*., 2001; Inoni *et al*., 2006; Emuedo *et al*., 2007; Emoyan *et al*., 2008). Oil reduces soil fertility (Osuji and Nwoye, 2007), smothers economic trees and food crops; kill them out-rightly and reduce crop yield (Edema *et al*., 2009). Also, oil causes 60% reduction in household food security (Ordinioha and Sawyer, 2008) and reduces crops quality. According to Nwaoguikpe, (2011) the ascorbic acid content of waterleaf was reduced by 36%, while cassava crude protein content was reduced by 40% (Osam *et al*., 2011). Crude oil also reduced maize (*Zea mays* L.) germination and yield by 50% and 92% respectively (Udo and Fayemi, 1975) and acutely impacted height, stem girth, ear height, leaf area and length of primary roots of the plant (Amakiri and Onofeghara, 1984**;** Ekundayo *et al*., 2001). Similarly, crude oil stunts the growth of most common vegetables (Omosun *et al*., 2008).

In addition to incessant oil spills, oil operations in the Niger Delta have also involved massive gas flares. The highest volume of gas worldwide, about 75% is flared in the region (Marland *et al*., 2005). Nigeria flared 22.8 trillion of gas from 1958 to 2003, from the 22.8 billion barrels of oil it produced; a thousand cubic feet of gas is flared per barrel produced (Rowell *et al*., 2005). According to World Bank (2007) gas flared in the Niger Delta contributes about 70 million metric tons of carbon dioxide emissions yearly (10 percent of global CO_2) and also releases about 12 million tons of methane (CH_4); considered to have higher warming capabilities than CO_2 (World Bank 2002; ICF, 2006). The impacts of crude oil on the environment have negatively impacted agriculture in the region.

Indeed, the combined impacts of oil pollution and gas flares have affected the environment, with concomitant acute adverse effects on agriculture in the region (). For instance, pollution from oil spills has led to poor water quality in the Niger Delta. Aquatic organisms' have diverse response to pollution (Egborge, 1994). Fish and other aquatic species react to water quality (Patil, 1976:38; Obeng, 1981:340; Ogbeibu and Ezeunara, 2002); water quality impacts the composition, assemblages and distribution of fish species (Boney, 1983; Kutty, 1987). Oil activities seem to have impacted availability of aquatic products in the Niger Delta, as, fish, Cray fish, periwinkle, crabs and edible frogs are no longer readily available (Hassan *et al*, 2002). Aquatic species seems to have dwindled in the region. For example, Aghoghovwia *et al*. (2015) recorded only 34 species compared to 91 species by earlier studies (Okia-Anie, 1980:65-68; Okumagba, 1988; Dibia, 1989; Tetsola and Egborge, 1991 Agada, 1994). The species number is also lower than 58 species recorded for flood plain rivers in Africa by Welcome (1979). Studies show that acute and chronic effects of oil pollution deplete environmental resources that may result in death of living organisms in the environment, either immediately or with time (Hofer, 1998; Cole, 1997; MacFarland, 1998). It is therefore not surprising that 75% of respondents a study Emuedo (2013) avers that fish catches have drastically reduced in the region. Studies Omoweh (1978) and Emuedo have indeed reported that adverse impacts of oil activities in the Niger Delta environment, has led to virtual extinction of some species of flora and fauna (Table 1).

Flora/ Fauna	Significance	Remarks
Coco yam*	Major staple food widely grown in the region; a main source of carbohydrate like yam and cassava	Farmers stopped farming it since the mid 1970s due to very poor yields
Electric fish*	A dominant fresh water fish; a major source of protein found mostly in fish ponds	Extinct since the early 1980s
Iku-evwevwe**	Tiny reddish fresh water Cray fish. Not eaten by Urhobos, sold and also used for sacrifice (appease spirit of bed wetting)	Decrease catch noticed in the early 1980s and now, it is virtually extinct
Cat fish*	A common fresh and salt water fish in the region found in natural water bodies; a major source of protein	The fresh water type has been very scarce since the 1990s; now found in commercial fish farms
Ohorhe fish**	Large scaled fresh water fish, not eaten by Urhobos but killed for sale	Has become virtually extinct since the early 1980, in the area
Edible frog (Okerhe)**	A dark smooth skinned fresh water frog found in natural water bodies; a source of protein and also used for medicinal purposes.	It has now virtually extinct as it is hardly found now
Iseun**	A type of small fish that moves in a very large school, caught by fisher men along with Cray fish; source of protein for most poor people as it is sold at very cheap rate.	It has now virtually extinct as it is hardly found now though Cray fish is still available in the markets
Igieneba**	A small fresh water fish that moves in a very large school, caught usually in shallow streams and rivers	It has now virtually extinct as it is hardly found now in the markets
Epepete**	A small fresh water fish found in large schools usually at the beginning of the rainy season, caught by people even with ordinary basin in the early mornings or late evenings and sold very cheaply	It has now virtually extinct as it is hardly found in the markets

Table 1: Effects of oil pollution on sampled flora and fauna of the Niger Delta
*Source: *Omoweh 1978; **Emuedo 2010.*

The adverse impacts of oil spills on agricultural practices have been further exacerbated by the impacts of gas flares on the environment. Oil operations have involved obsolete equipments and unsustainable practices, as, most gas produced is flared (Hunt, 2000; Ibhade 2001). According to Word Bank, (2009) over 150 billion cubic metres of gas is flared yearly. The high level of gas flares in the region has generated serious concerns (Enehoro, 1973; Aggrey 1983; Obadina, 2000; Oghifo, 2001). Gas flares impacts micro-climate and vegetation (Odilison 1999, Efe 2003), soil, air and water quality (Ekanem 2001) and human health (Obajimi 1998; Oniero and Aboribo 2001). This is because gas flares give rise to atmospheric contaminants; oxides of Nitrogen, Carbon and Sulphur (NO2, CO2, CO, SO2), particulate matter, hydrocarbons and ash, photochemical oxidants, and hydrogen sulphide (H2S) (Obioh, 1999; Kindzierski, 2000). These contaminants acidify the soil, depletes soil nutrients and nutritional values of crops (Imevbore and Adeyemi, 1981). Most often, there is no vegetation in the areas around flare sites due to the extreme heat that is produced and acid nature of soil pH (Ubani and Onyejekwe, 2013).

Also, gas flares have been linked to soil depletion (Abara, 2009) vegetation destruction; over 10 hectares in 1998 (Odilison, 1999) and pollution of rivers (Ekanem, 2001). At temperatures of about 1,300^{o}C to 1,400^{o}C, gas flares heat up everything (Ake, 1996) and heat radiation from flares result in micro bacteria decline (Okezie 1989) leading to poor crop yields (Nelson *et al*., 2003). Gas flares in the Niger Delta have led to decreased yields in most common crops. Several studies have linked gas flares to low agricultural activities; fishing and hunting, thus impairing livelihoods (Alakpadia, 2000; Daudu, 2001; Udoinyang, 2005; Inoni *et al*., 2006). Specifically, gas flares have drastically reduced the yield common food crops and vegetable; sweet potato (Udoinyang, 2005), cassava/yam (Odjugo, 2007) egusi melon (*Citrusllus Lanatus*) (Odjugo 2010). Indeed, Adeyomo (2002) reported a 10% decrease in crop yield at a distance of 1000 metres, 45% decrease at a distance of 600 metres and 100% yield loss at a distance of 200 metres from a gas flare point for most food crops in the region. Gas flares have also impacted on common tree and food crops in the region as shown in (Table 2).

Crop	Problem associated to gas flaring by farmers in the Niger Delta Akri
Yam (D. rotundata)	Gas flare (GF) continuously emitting heat radiation, light and unburnt gas drastically reduces yield, both quantitatively and qualitatively. GF attracts insects, such as variegated grasshopper (Zonocerus variegates) that eats up vines, and yam beetle (Heteroligus spp.) that attacks yam tubers.
Cassava (M. esculenta)	Gas flare attracts grasshoppers, which eat up the plants
Mango (M. indica)	Gas flare causes premature ripening of fruits, especially during the dry season months of December-March each year.
Sweet orange (C. sinensis)	Gas flare effect is similar to that of mango. In addition, farmers believe that toxic effluents dispersed by flood water to homes and farms adversely affect the crop.

Table 2: Effects of Gas Flares on Common Crops in the Niger Delta
Source: Daniel-Kalio and Braide (2006:6)

As we shall see, adverse impacts of oil operations on the environment have had myriads socio-economic impacts on women women's livelihood, resulting in their diminished status. The near demise of agriculture led to poor incomes for women and food shortages.

According to Braun *et al*. (1992) food scarcity leads to productivity losses, misallocation of scarce resources, lower cognitive ability and ineffective income earning decisions.

4. Environmental Changes and Women Economic Security

Agriculture is the core activity of rural people" (FAO, 2006). It is the basis of life sustenance (World Bank, 2008; IFAD 2002), income and source of peace for rural dwellers (Messer, *et al*., 1998; de Soysa and Gleditsch, 1999; UNU-IAS Report, 2004; Addison, 2005). To the Niger Delta people especially women agriculture is an unbreakable link in life sustenance. Before the advent of oil, the Niger Delta's economy depended solely on agricultural commodities. For instance, palm oil produced in the region became an export crop in 1558, and by 1830, dominated Nigeria's export list for more than 50 years. Agriculture is the most dominant traditional economic activity in the Niger Delta. Farming and fishing according to FOS (1985) account for about 90% of all forms of economic activities in the region. Indeed, agriculture constitutes the main source of employment and income for rural women. Like other parts of Africa, 80% of agricultural production is from small farmers, who are mostly women. Due to their great efforts in agricultural production, women's production helps to guarantee their self-sustenance. However, agricultural practices in the region have been acutely constricted by the negative impacts of oil activities (Schiff and Valdes 1992) with dire impacts on women esteem.

The stultification of agriculture has meant inadequate food production and food insecurity. Food insecurity results in human suffering, substantial productivity losses and a misallocation of scarce resources due to diminished work performance, lower cognitive ability and ineffective income earning decisions (Braun *et al*. 1992). The negative effect of oil activities on the environment in general and agriculture in particular in the Niger Delta, have been widely acknowledged by several studies (Udo and Fayemi, 1975; Amakiri and Onofeghara, 1984**;** Ibeanu 1997; Obi, 1999; Roberts, 1999, 2005; Ekundayo *et al*., 2001; Inoni *et al*., 2006; Emuedo, 2007; Emoyan *et al*., 2008; Ayodele, 1985).

One of the main ways that oil activities have directly constricted agricultural practices in the Niger Delta is in land requirements for oil operations. Annually, large chunks of lands deployed hitherto for agricultural purposes are lost to oil activities. For instance, a minimum of about 7.7 hectares of land is required to site an oil well and a helipad. Also, land is needed to construct access road, pipelines, borrow pits, waste disposal sites and seismic lines. As a result, oil-host communities in the Niger Delta have lost erstwhile farmlands to oil activities. Reduction in agricultural land has led to increased land fragmentation and consequently, decreased crop production. A glimpse of the quantum of land required for an oil well and its accessories is illustrated with the case of Okrika, (Table 3) in Rivers state. This illustration typifies the situation in all oil-host communities in the Niger Delta

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Name of oil field	No. of wells	Area per well	Total area for wells	Area for activities around well	Area for Helipad	Area for flow station	Total land area for oil activities
Bolo	10	6.3	63.0	1.2	1.4	6.3	71.9
Iwokiri	9	6.3	53.7	1.2	1.4	6.3	65.6
Mbikiri	8	6.3	50.4	2.4	1.4	6.3	60.5
Agokien	34	6.3	214.2	2.4	2.8	6.3	225.7
Ele	11	6.3	69.3	2.4	2.8	6.3	80.8
Oraberekiri	21	6.3	132.3	1.2	1.4	6.3	141.2
Wakama	26	6.3	163.8	1.2	1.4	6.3	172.7

Table 3: Arable land area lost to oil related activities in Okrika LGA, Rivers State (Ha)
Source: Adeyemo (2002)

According to Adeyemo (2002) the community lost over 818.08 hectares of land to oil activities, which deprived farmlands to over 900 women. The picture of arable land lost to oil activities would be clearer, when we put into perspective the fact that the Niger Delta today harbours a massive oil infrastructure consisting of 606 oil fields 360 on-shore and 246 off-shore, 5,284 wells, over 7,000 kilometres of pipelines traversing a land area of about 31,000 square kilometres, 10 export terminals, 275 flow stations, 10 gas plants, 3 refineries and a massive liquefied natural gas (LNG) (Watts, 2007). These huge infrastructures (Table :) together with staff housing roads and canals construction by the oil companies entail land acquisition that has in real terms involve the loss of agricultural lands to oil activities. Additionally, Shell as at 2001, held over 400 kilometres square of land for its operations, most of it reserved for future use. This land holding is exclusive of land acquired for "short-term" purposes; seismic projects and temporary staff housing and land not acquired for petroleum development but, nonetheless, rendered useless as part of ecological collateral damage from oil activities. Also, Chevron's operations as at 1998 spanned over 5,000 kilometres offshore and 2,600 kilometres of onshore lands in the region. Though the amount of land used for oil activities, may be considered small, by comparison with the total area of the region, the effect of the resultant land fragmentation on access to land for women is devastating to their economic well-being.

% contribution of crude oil export to national forex earnings	Over 80%
Average daily crude oil production	2.45 million bpd
Number of oil wells drilled in the Niger Delta	6,284
Number of flow-stations for crude oil processing	257
Length of oil and gas pipelines in the Niger Delta	Over 7000km
Number of export terminals	10
Land area within which the network of pipelines is located	31,000sq km
Number of communities hosting oil / gas facilities	Over 1,500
Number of gas flaring points in the Niger Delta	133
Number of gas plants in the Niger Delta	10
Number of marginal oil fields farmed out to local companies	30

Table 4: Oil and Gas Infrastructure and Production Related Activities in the Niger Delta
Source: Niger Delta Regional Development Master Plan, 2006; Watts, 2007.

Thus, oil activities without even its attendant negative effects are a hindrance to the availability of land for agriculture in the Niger Delta. A 1995 study revealed that between 1992 and 1993 land area under food crop production in Bayelsa, Rivers and Delta states decreased by 41.7% and 15% respectively; due to oil, related land sequestration. This practice besides constricting women access, to land, increases land fragmentation leading to decline in crop production, which impacts women's income. Land requirement for oil activities in the Niger Delta, renders women economic activities unviable, and insignificant (Charlton, 1997; Visvanatban, 1997). Women bear the heaviest burden of environmental changes because often, they are uneducated and poorer, thus, depend mostly on natural resources for their livelihoods (FAO, 2011). As, such, oil activities have led to myriads of socio-economic and environmental, problems; soil infertility and damages to crops and marine life from pollution (Amadi and Tamuno, 1999); leading to dislocated livelihoods, rural-urban drift, and poor health (Elis, 1994; Amadi and Tamuno, 1999). However, despite all these, neither the state or the oil companies have commissioned scientific studies to ascertain the adverse effects of oil activities on the region's environment since 1956 (van Dessel, 1995; Mamby, 1999). Thus, the people especially women have continued to bear the brunt of oil operations on the environment, with no hope of alternatives.

5. Environmental Insecurity and Women Initial Coping Strategies

As already shown elsewhere, oil operations in the Niger Delta even without the attendant negative effects are a hindrance to the availability of land for agriculture. A major factor for the heavy oil-related land use is that unlike the Persian Gulf where oil is concentrated in major pools, and the North Sea countries, where oilfields are mainly offshore, oil occurs in small fragmented pools onshore across the Niger Delta. As a result, oil operations in the region have entailed practically littering villages, farms, forests, swamps and streams with oil facilities (Udo, 1970:62). It is a well-known fact that arising from its topography land is scarce in the Niger Delta and scarcer still is arable land. For instance, it is estimated that of the 2,185,000 hectares that is the land area of Rivers and Bayelsa states about half of it is swamp land which hampers certain agricultural practices. In Delta state, of 1,769, 800 hectares, which represent its total land area, about a third are similarly swamps. Thus, continuous loss of land to oil spillage and other oil-related activities is basically the destruction of women's means of livelihood. Historically, lands are owned and controlled by men in the Niger Delta, and due to the topography land is scarce. As a result, women have intensely struggled to access farms or fishing areas. Oil activities have exerted further pressure by its virtual sequester of most lands for oil production and erection of processing facilities that are built on erstwhile arable lands and fishing grounds. This has exerted acute pressure on agricultural practices; farming and fishing (Hutchful, 1985:51; Turner and Badru, 1985).

Indeed, since the advent of oil as a source of power in Nigeria, its social relations of production have tended to alienate local people mostly women. In addition, interaction between the oil companies and their host communities breeds a variety of contradictions that reflect the contour of power that enriches them, while impoverishing local people especially women. Women have been alienated from the social relations of oil production and have been hardest hit by environmental impacts of oil activities (UNDP, 2002). In farming and fishing especially, oil activities with associated pollution have constricted the economic space for women. For instance, an impact assessment of the 1983 Oshika oil spill by Powell and White (1985) confirmed the death of floating and submerged aquatic fauna; water lettuce, crabs, fish and birds. Also, the Bomu II oil spill of July 1970 impacted over 607 hectares of farmlands; denying women from farming in the area for years (Odogwu, 1981). Fishing activities for women was also reduced as fishing gears; cast net, drift net, set hook, line hook, fish fence, crayfish, shrimps and fish traps were destroyed. Furthermore, fish catches reduced drastically than catches prior to the oil spill years after the spill (Chukwu *et al*., (1998). Scientific studies (NDES, 1997; Egborge, 2000; Orubu *et al*., 2002; Otukunefor and Biukwu, 2005) have shown that unregulated and unsustainable methods of oil operations in the Niger delta account for the acute pollution of the aquatic ecosystems. Also, the politics of oil and its commoditisation of the environment also exclude the rural women from its labour needs, as, they are often, not accorded formal education (Turner and Oshare, 1993). This has constricted women economic activities; diminishing their social status. The diminution of their economic activities renders women contributions immaterial and unviable economically (Charlton, 1997; Visvanatban, 1997). Also, lacking access to land, women are unable to access credit, due to lack of collaterals (land/real estate) often, required by banks (Nwogu, 1995; Igube, 2007:60-61). This has disadvantaged and impoverished women vis-a-vis men; engendering marked inequalities in social and economic roles between men and women (Oakley, 1974:11). This is because equitable resources distribution contributes to equitable relations between men and women while imbalanced access by men and women to resources lead to imbalanced relations Alliyu, (2007:6).

Women initial reaction to the impacts of oil activities on the environment and hence, their means of livelihoods was to embark on protests; meant to draw attention to their plight. This led to series of women's anti-oil peaceful protests across the Niger Delta. The first protest was at Ogharefe in 1984 against a US oil company Pan Ocean (Turcotte, 2002:1). The protest was anchored on women's demands for the oil companies' improvement of the socio-economic and environmental conditions of the oil-host communities in the region. This protest achieved some level of success, as some of the women's demands were met by the oil company. The next to follow was Ekpan women's Revolt that began at 5 a.m., on Monday, August 25, 1986, involving crowd of women estimated at about 10,000 from Uvwie clan against the Nigerian National Petroleum Corporation (NNPC) Refinery, Petro-chemicals Plant and the Pipelines and Products Marketing Pump station, all located at Ekpan. The throng was made up of women of all age groups including the very old (Daily Times (Nigeria), August 28, 1986:3; Sunday Telegraph (Warri), August 31, 1986:1). This was followed by Ijaw and Itsekiri women's protest that took place on May 23, 2002, against another US oil company Chevron (INDYMEDIA, 2002:1-3; Okpowo and Adebayo, 2002:1-4; A.I, 2003:1-9). Though the protest involved only about 300 women it was considered most remarkable protest due to the women's threat to strip naked, giving rise to intense international media attention on it for the 10 days it lasted (Branigan and Vidal, 2002:8). These protests were considered successful as some of their demands were met by the oil companies.

However, by the late 1990s things changed for the women, as the oil companies became vicious in their response to women mass protests. This was manifested by the acute repression of two women protests in Warri against Shell and Chevron on August 8, 2002 involving over 3000 women from the three ethnic groups in Warri; Urhobo, Ijaw and Itsekiri. In both companies, the women were abandoned for about 12 hours by both companies' officials, and then brutally dispersed by a joint team of soldiers and mobile policemen with tear gas, gun butts, and horsewhips, while shooting into the air rapidly with AK 47 riffles (Emuedo and Emuedo, 2014). The women were simply brutally and dispersed without an opportunity to dialogue with the officials of the companies. We can therefore, see clearly that the oil companies became rather very vicious in their response to women mass protests after some initial successes. With their means of livelihood alienated by oil activities and left with no options, women in the Niger Delta resorted to other survival strategies.

6. Environmental Insecurity and Women Socio-economic Status

Socially in all societies there are usually gender assigned tasks and obligations. Traditionally, in the Niger Delta, based on the division of labour women provide for the family's upkeep (Onoge, 2002:6). This makes "women producers, procurers and preparers of food" (Okon, 2002:67) and they rely entirely on the natural environment to achieve these tasks. This because rural women in the Niger Delta, as, in the world over, being uneducated, rely mostly on diverse forms of agricultural practices, for their income and about 90% of family food needs (Weidemann, 1987; Picard, 1995; Moser 1996; Davies 1996a,b; UN-ECA, 2001). But impacts of oil operations on the environment have disrupted traditional livelihoods, leading to food shortages (Udonwa *et al*., 2004; Udoh *et al*., 2008; 2009) and servile poverty for women (Uchendu, 1995). The havoc wrecked on the environment by oil activities abolished fish products from coastal waters and creeks, leading to continual dwindling harvests. This has led to huge rise in the prices of fish and farm products. For instance, since 1995, the cost of fish and other sea foods have soared; a good milk cup of shelled periwinkles now cost between ₦350.00 to ₦400.00, while a depressed cup sells for between ₦250.00 to ₦350.00 Hitherto, a full good milk cup cost just ₦25.00. Besides, it is mainly juvenile sizes of periwinkles that are now sold in most markets except in Nembe where periwinkle has no commercial value that some seemingly medium sized adults can be found" (Emuedo, 2013). Also, bonga fish and its fingerlings (Isogu), (often given out free) by most women are now rare commodities. The fingerlings are now virtually extinct, while a very tiny piece of dry bonga fish now selling for over ₦90 and a medium size sells for between ₦130 to ₦150. In the past, ₦100 worth of bonga fish purchased directly from fisher men and women could last an average family for two weeks. Similarly, a bowl of shrimps (about two-litre volume) sells for ₦6000, while Crayfish is ₦3000. The cost of these items in the past was ₦650 and ₦250 respectively.

Thus, the erstwhile close to nature feeding life style of the people has deviated drastically, due to oil activities. As a result, most people in oil-host communities live in their ancestral communities, like strangers; they now buy food as against the past when people feed themselves from their own produce. This practice was totally alien two decades ago in the region (Clark, *et al*. 1999:9). This because due to peoples disconnect from their traditional means of livelihood by oil induced changes in the environment; most people in oil-host communities resorted to buying their foods. As Eaton (1997) opined, food items; fish, sea foods, cassava, garri, yam, plantain and fruits hitherto produced in surplus and sold cheaply are so scarce that they must be purchased from communities far from oil-host communities at exorbitant prices. The situation has been further worsened by the obtuse neglect of the region in the provision of developmental infrastructure.

The ecological effects of oil activities on the environment impacted women economically and socially severely in the region's oil-host communities. It crushed their ability to meet their families' food needs or earn income. As some writers (Chambers and Conway, 1992; SIDA, 1995; Grown and Sebstad, 1989) have aptly observed; in time of crisis individuals and households usually adopt myriads survival strategies. The Niger Delta is no exception. Thus, as women's peaceful protests failed to improve their situations, they sorted other survival measures, provided ironically by the oil industry. Oil locations create a false sense of "sweet life" that has triggered various unholy practices. For instance, prostitutes' enclaves "Ashawo" villages where single girls engage in sordid sex "rings" are proliferate. Also, rampant, is the increasing practice of young single girls leasing rooms. Most of these young girls involved in commercial sex are either indigenes or migrants from proximate communities and towns. The lack of formal economic prospects in the face of traditional gender roles has made sex work a survival strategy for many women in the Niger Delta.

The commercial sex trade is buoyed by the sexual activities and advances of oil workers, whose presence is ubiquitous in the region; when they come ashore after months of separation from the society. It has also been aided by the high concentration of military and

private security officers protecting oil facilities. Thus, most patrons of the prostitutes are connected to the oil business. Towns, villages and even hamlets in the region have seen influx of male workers from other parts of Nigeria as well as a large expatriate community. This has led to an increasing throng of women flocking the region from other parts of the country to earn easy money. The ease with which these women make money from oil workers, coupled with poverty, and lack of alternative means of livelihoods have led many hitherto upright young girls and even housewives in the region into prostitution. The temptation that women (young or old, married or unmarried) are exposed to as a result of what one may call "dollar sex trade" is quite intense. For instance, we all know that ₦500 or even ₦1000 is quite small but imagine being offered between $1000 and $2000 for sex that will last no more than five minutes?" That is a very huge amount of money in naira and with the poverty level in the region, most women easily fall prey even against their better judgement. With orchestrated superior living standard openly exhibited with fat wad of dollars offshore oil workers mostly expatriates, often with uncontrolled sexual behaviour tempt and lure innocent girls and even housewives into quick sex when they come ashore. Inadvertently, this lead to unhealthy relation not necessarily rooted in intrinsic affection but as a survival strategy to eke out a living since oil activities have made useless their traditional means of livelihood. Thus, erstwhile long established social values rooted in culture and traditions of the people have been adversely altered. As a result, many women even otherwise decent housewives have become permanent or part-time commercial sex providers. However, this has not been without adverse social effects on women despite the economic gains; unwanted pregnancies, unwanted children, unwanted abortions unwanted single parenthood and "mulato" (white skinned) children. According to Jike (2004:697) the sex trade has led to acute moral decadence in family and marriage institutions; legally married wives disengaging from their husbands and engaging in sex business.

There is no doubt that the moral decadence in the region, especially in oil-host communities is closely tied to the oil industry. For instance, Emuedo (2010) in a study reported that "Sometimes, young girls after been raped by members of the security forces that are also highly concentrated in the region are forced into what is now commonly known in the region as "military prostitution". Most members of the security forces wherever they go, usually set-up brothels and then force local girls to prostitute themselves therein. Often these girls are forced to engage in bestiality with expatriate oil workers. The families of such girls are usually singled out for "special treatment" (severe repression) if they try to protect their children and or refuse to perform".

7. Conclusion

Whereas, youths transformed anti-oil protests in the Niger Delta into a near full-blown insurgency, it was women who gave the first hint of the stultifying effects of impunity of oil operations on the environment and the people. The primary role of women as food gatherers and providers for their families exposed them to the negative effects of oil activities on the environment. As the saying goes; "the one wearing the shoe knows where it pinches" Thus, to safeguard their traditional roles they embarked on peaceful protests to draw attention to their plights. The oil companies' response to the protests was merely cosmetic, and failed to improve their situation as the environment in fact worsened. The lack of education makes most women unfit for paid employment in the Niger Delta, hence their resort to "survival" strategies. The strategies resorted to by the women for survival went against the basic tenets of the traditional society in the Niger Delta, thus, demeaning their status.

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