

Women in the Niger Delta: Environmental Issues and Challenges in the Third Millennium

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Introduction

The Niger Delta is located in Southern Nigeria and is Africa's largest delta, covering about 70,000 square kilometers, and with about one-third of it made up of wetlands, and the third largest world mangrove forests. The Niger Delta is unique in Nigeria because it is the home of Nigeria's oil industry, with its attendant environmental hazards such as water, land, air pollution, etc. Human activities and those of oil exploration and exploitation raise a number of issues such as depletion of biodiversity, coastal and river bank erosion, flooding, oil spillage, gas flaring, noise pollution, sewage and waste water pollution, land degradation and soil fertility loss, deforestation, etc which pose great challenges to women's economic development of the Niger Delta.

This study focuses on the consequences of the above-mentioned environmental issues on women's economic activities in the Niger Delta communities of the following oil producing states in Nigeria, which are Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Rivers and Ondo.

Ecology and Women's Economic Activities

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 endeavors, the rural women in particular. The soil types, water, climate, physiography, 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 seafoods. 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 (*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. Fishing in this zone is practiced on a very low scale, mainly for subsistence. Pottery making cuts across the three vegetative zones discussed and so does trading. In fact, women dominate in the retail trade, at both local and long distance levels in the Niger Delta. It is with regard to the economic activities that environmental issues and challenges in the Niger Delta are examined, and as they negatively impact women. Faced with the challenges at the dawn of the third millennium, what adjustments and coping strategies can women make and adopt in order to sustain their existence, improve on their quality of life and contribute actively to the sustained development of the Niger Delta through out the third millennium.

Environmental Issues and Women's Economic Activities

The role and importance of women in relation to environment and development in the Niger Delta is crucial because women depend on the environment for their daily needs such as water, fuel, food, etc. Women not only endure the most of environmental degradation, but also play a vital role in environmental management. The issues that pose challenges are worrisome as they reduce the quality of life of women and the entire human population of the Niger Delta. The threat to the resource base and existence of the Niger Delta in this regard, underscores the Agenda 21 of the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in 1992. Thus, the threat to women's economic activities in Niger Delta is not a local or national issue but is of international concern and requires examination.

Oil Spillage

Oil spills are caused by variety of factors such as blowout, equipment failure, burst/rupture of flow line/pipelines, corrosion of flow line/pipelines, over-pressure, overflow (tanks), valve failure, hose failure/single buoy moorings (SMB); operator/maintenance error, engineering error, sand cut (erosion), accident, sabotage, etc (Awobajo, 1981). Whichever way, oil spillage damages the environment. In Rivers State, an oil well in Shell Petroleum Development Company's (SPDC) Bomu Field (Bomu II) which had been producing for nine years blew out, on 19th July 1970 and spilled oil on agricultural land before it was stemmed. The estimated area impacted upon was 607 hectares (1510 acres). Crops were damaged; women could not farm on this polluted land area for about three years. Farming commenced on the less contaminated area only after one and half years (Odogwu, 1981).

Although farmers and landowners were paid compensation, women who traditionally do not own land could not benefit and this had a negative consequence on their economic resource base. Compensation is paid once but the extent of land degradation by oil spillage lasts longer and reduces available land for

agriculture. In fact, the Bomu (Gokana LGA) oil spillage still leaves most part of the land desolate, infertile and unproductive. Earlier in the late 1960's, during the Civil War, a leak at SPDC's Ejamah-Ebubu oil well in Eleme (Rivers State) degraded farmlands. Later investigation and assessment of the Ebubu oil spill site showed the presence of contaminants. For this reason, SPDC planned clean up and remediation in 1998 (SPDC Environmental Report 1997). The presence of contaminants for over twenty years after is also indicative of the extent of economic deprivation female peasant farmers' experience. Sometimes, they have to abandon such farmlands or contend with poor yield if they have to farm on them. In 1972 there was another oil blow out, the Safram (now ELF) Obagi 21 oil field at Obagi (Rivers State). In 1980 again, there was also the Texaco blow out. In 1993, Ogoni land (Rivers State) after the Bomu experience, had another oil spillage. This time the oil pipeline leak was from SPDC's Kokori Flow Station, which lasted for about two months before it was stemmed, damaged crops and farmland beyond estimation. In 1997 again, Ebubu witnessed another oil spill from a corroded manifold, in which 3,000 barrels of oil was spilled.

This situation is better appreciated from an examination of field and laboratory studies on the impact of oil pollution on crops and soil. Odu (1981) noted that oil deposited on leaves of plants, penetrates the leaves and reduces transpiration and photosynthesis and that leaves become yellow where oil pollution is light. However, heavy contamination results in defoliation. Oil polluted soils on the other hand, create a condition which makes nutrients such as nitrogen (essential for plant growth) unavailable to plants but increase the availability of toxic nutrients. Thus, oil contamination of the soil makes arable land unsuitable for agriculture. The effect can last for months or years depending on the degree of contamination.

Land Degradation

Oil spillage resulting in land degradation and soil fertility loss compounds women's limited access to land for agriculture in the Niger Delta. Women neither own land nor inherit any in the Niger Delta. This traditional practice, which alienates women from owning this economic resource base only, allows them access to land through their spouses, sons, brothers and/or male relations. This issue is well documented; Ekwe (1996); Idisi (1996); Okonji and John (1996); and Okonji (1990). Given these challenges, land as an economic power resource base becomes critical for the Niger Delta women except the oil companies are capable of controlling oil spillage and that traditional land ownership practices are revised in favor of women. However, women rent farmlands in Delta, Akwa Ibom, Imo and Rivers states. This is largely determined by their financial base and the extents of the men folk are ready/willing to lease or rent. This situation also makes it expedient that women engage in other economic ventures in addition to farming. Again, the feasibility of this depends on how much they can save from farming activities, which are laborious. Apart from the fact that women use crude implements, they also engage in agricultural production such as land cleaning, land tilling, planting, weeding, fertilizer or manure application, harvesting, food processing, etc., which do not give them much time to cope conveniently with domestic chores, recreation, etc. Thus, there is likely to be less food production in the Niger Delta as

women farm on lower quality land that decrease yields. Nutrition will also be poor and women have less time for other social activities.

There are oil production related activities that limit available land for agriculture in the Niger Delta. For example, about 20,000 square meters of land is required for establishing a drilling site which accommodates a pad (a pad occupies 5,000 square meters of land). Apart from the site there is need for construction of roads to oil locations, laying of pipelines, waste disposal sites, borrow pits, seismic lines and housing for drilling or construction personnel. Borrow pits in the Agbada field and contaminated soil in the Elemenwa field also caused loss of soil fertility in these areas. However, SPDC rehabilitation measure/strategies give a ray of hope that some portions of degraded land would be recovered if their strategies were efficient and effective. The question again is how soon will these degraded land recover? Alakiri site was re-vegetated, Agbada and Elemenwa fields, are being recovered by using microbes to break down the oil contaminated soil. Rehabilitation work on Kosini dumpsite, Ewreni – 10 drilling waste pit and that of Tunu (Delta State) are being rehabilitated too. It would be more encouraging if other oil companies emulate SPDC and even introduce more efficient strategies for land recovery.

Water Pollution

Water pollution resulting from oil spillage is another major threat to women's fishing, seafoods and fuel wood collection in the Niger Delta. Many rural women in the riverine communities depend on these economic activities for their livelihood. Such threats/situations impoverish the women and create challenges that not only bother women, but also spell doom for the larger human population if unchecked. For example, in July 1979, the Forcados Tank 6 Terminal incident spilled 570,000 barrels of oil into the Forcados estuary in Delta State polluting the aquatic environment and surrounding swamp forest. The Funiwa No. 5 well in the Funiwa field blew out an estimate 421,000 barrels of oil into the ocean from January 17th to January 30th, 1980 when oil flow ceased. According to Ekekwe (1981), the principal zone of impact extends from Fish town, to the Sangana River and affected Koluama I, Koluama II, Sangana, Otuo and Fish town villages (Bayelsa State). Some mangroves in these villages were defoliated while some died, crabs and periwinkles died. About 836 acres of mangrove within six mile off the shore were killed. Oysters that live on mangrove pop roots were destroyed. In August 1983, Oshika village in Ahoada Local Government Area, Rivers State, witnessed a spill of about 5,000 barrels of oil from the Ebocha-Brass (Ogoda-Brass 24) pipeline into its flooded swamp forest and lake. This area had witnessed a similar but small oil spill of 500 barrels in September 1979. Crabs, fish and shrimps died. In fact, for shrimps, (*Desmocarid*) embryonic mortality continues for about eight months after the spill and these Power et al (1984) attributed to oil in the sediment of the lake. There was also reduced reproduction rate and population level. The Ogoda-Brass Pipeline Oil spillage near Etiama, Nembe which occurred on 28th February, 1995 spread into the freshwater swamp forest, the bigger Agbakabiriyai creek and into the brackish water mangrove swamp system. An estimated 24,000 barrels was spilled. According to Odu (1997), the oil spill still had some negative effect on some zooplankton, particularly the larval forms which are of economic significance. Macro algae, which were wiped out from the impacted

area, not only serve as food but also as refuge reproductive nest area for fish and other aquatic life. This feature obviously reduced fishing activity for women. Periwinkles (*tympanotonous fuscatus*) were eliminated in the affected areas and this is a food source, even for protein, on which the people depend. Fishing activities in the heavily polluted areas was insignificant while common fishing gears, such as cast net, drift net, set hook, line hook, fish fence, crayfish, shrimps and fish traps were abandoned. Women in Okirika community complained about depleted fish and sea foods stocks due to oily discharges from the Port Harcourt refineries located close to Okirika.

On January 12, 1999, a Mobil Crude oil pipeline blew out about 40,000 barrels of crude oil into the Atlantic Ocean destroying marine life and economic activities of women in coastal communities of Akwa Ibom State located in Mbo, Itu, Ibeno, Nsit Ubium, Ikot Abasi, and Eastern Obolo, local government areas. Again, the Mobil Idoho oil spill affected Awoye, Aiyetoro, Orioke, Iwamimo, and Araromi in Illaje local government area (Ondo State) whose major occupation is fishing. Here, the presence of fish, shrimps and crabs were reduced. Fishing nets and traps were heavy with oil. As Chukwu et al (1998) noted, bonga fish landing from the catch were far less than landings before the oil spill incident. Yet, their investigation was carried out four months after the spill. The vegetation in Awoye, Aiyetoro and Araromi, within the high tide mark of the forest by the canals and creek and those along dredge spoils were yellowing and had chlorotic symptoms. In Awoye and Aiyetoro oil accumulated around mangrove, roots and seedlings led to plant mortality and defoliation. Intertidal mud soaked with oil smothers pneumatophores of *Avicennia* led to death of roots and plants, death of macro algae and animals of intertidal mud which are of economic value to women. The Diebu Creek flow station oil pipelines crossing the River Num (Bayelsa State) ruptured on May 28, 1998 and adversely affected Peremabiri, Lasukugbene, Oyeregbeni, Ikonamogbere, etc. Women were prevented from fishing for the eleven days oil gushed and thereafter. Again, enormous damage to marine life was observed. Aleibiri (Bayelsa State) oil spill destroyed farmlands, ponds, economic trees, etc. The incidents of oil spill in the Niger Delta cannot be recounted in a study of this nature. Whatever the number, it is clear that they impact women's economic activities negatively. Mangrove leaves provide detritus-based food webs, and benthic invertebrates in large population and predators such as fish. Their presence attracts mudskippers, mullets, snails, crabs, periwinkles, oysters into the mangrove swamps where women fish.

In the Niger Delta, women and children harvest snails and seafoods on mangrove and fresh water and flats. Women fish in creeks and mainly at ebb tide. From Nembe, Sangana, Aleibiri, Awoye, Iko (Eastern Obolo), etc, fish, seafood – periwinkles, oysters, water snails, shrimps, crayfish – are transported to urban areas for sale. Women depend on these sources for their livelihood and other responsibilities. Pollution of this major economic base is worrisome. Since 1995, the cost of fish and other seafoods have soared increasingly. A good milk cup of shelled periwinkles cost ~~N~~40.00 (Forty Naira) while a depressed cup costs ~~N~~20.00 (Twenty Naira). Clamp costs ~~N~~80.00 and ~~N~~40.00 (Eighty Naira and Forty Naira) for a full and 3 meter full cups respectively. Hitherto, a full cup cost ~~N~~15.00 (Fifteen Naira). Another feature is that mainly juvenile sizes of periwinkles are sold in the market except in Nembe where periwinkle is not sold,

that one can find big adult sizes. There really is a diminishing trend largely attributable to oil spillage into the mangrove and fresh water swamps. Often times, oil spill is not cleaned up in time. This makes sedimentation of a large quantity of oil into the swamp bed possible as well as a prolonged negative effect. Again as in Aleibiri, Etiama and Funiwa where oil caught fire and burnt large acres of mangrove swamp the negative effects are really enormous. Fishes die when their gills are coated with oil, which contains hydrocarbons that prevent oxygen intake. Periwinkles, clams water snails, oysters, barnacles, etc, that move slowly, hardly move away from impacted areas and are burnt (where the area is burnt by fire) or suffocate.

Burning of large acres of mangrove wood, or their defoliation and eventual death, reduces fuel wood source for revenue generation and domestic activities. Mangrove wood provides special flavor to fish being smoked and is preferable to using gas for drying fish (Nwokocha, A. M. and Gabriel A. O. I. 1998). 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. Oil companies and Niger Delta citizens will do well to re-vegetate degraded mangrove swamps whenever the effect of oil pollution wears off.

Light crude oil is soluble in water and gives objectionable tastes and odors. Spills pollute ground water as the soluble hydrocarbon carries them into the ground water. Drinking water is adversely affected by the toxicity of crude oil. Women who bear burden of providing water, often times spend more productive or leisure time searching for water. For example, in 1989, the inhabitants of Obio/Akpor and Bonny LGA's of Rivers State had this traumatic experience when their rivers, wells, springs and other sources of drinking water were polluted by oil spillage. In Ondo State, tidal incursions due to soil erosion (a product of oil exploration hazards) forced women in some fishing villages such as Apata, Awoye, Ojumote, etc, to paddle for at least twelve hours into other parts of Ondo and Edo States in search of fresh drinking water. One year after the Funiwa 5 oil blowout, ground water sample taken from the beach at Fish town was contaminated with crude oil but that from Koluama I had only trace oily sheen. This was even after a clean-up exercise of the affected area. Another vivid example from Delta State was the oil leakage from a 28-year-old trunk pipeline linking Jones Creek oil field, which occurred on Thursday, 26th March 1998 when 20,000 barrels of crude oil spilled into the creeks and mangrove swamps. Ofiebor (1998) reported that thirty-four communities, which source drinking water from the creeks, were adversely impacted. Some of the affected communities were Gbaramatu, Clan, Okerenkoko, Kokodia, Opurosa, Korotie, Okolobobugbene, Benekrukru, Epemu, Obafa, Kunkunu, Asama and Igbogho. Produced waters in the

process of drilling contain oils, variety of slats, solids and organic. Drilling mud also contain complex chemicals, organic and inorganic. When these wastes and refinery effluents are discharged into water bodies, pollution occurs. When fishes store some of these metals from pollutants in their bodies without them being metabolized, human beings in turn eat them and suffer abnormalities, cancer, etc. Women must be educated to know the harmful effects of using such water. Oil companies should not dispose of these wastes indiscriminately into water bodies. However, in the first seventy years of the operation of oil companies in Nigeria, there were no petroleum laws until the establishment of the Nigerian National Petroleum Corporation (NNPC). Consequently, water bodies were heavily polluted without check. Oil companies are still trying to acquire effective technology to cope with waste management. Thus, women in the Niger Delta in this new millennium still have to grapple with the environmental issues that challenge their economic resources.

Gas Flaring and Noise Pollution

About 95 per cent of waste gases (a by-product of oil) from the production fields and operation of the refineries are flared. Gas flaring pollutes the air and suppresses plant growth near the flaring points. In cassava, for example, there is decrease in length, weight, starch, protein and ascorbic acid (vitamin C) content (Imevbore and Adeyemi, 1981). Okra plants and palm trees around the flares do not flower and therefore do not fruit. Rubber trees do not also produce well. This experience is true of Owaza and Otu-Jeremi in Abia and Delta States respectively. Atmospheric contaminants from gas flaring include oxides of nitrogen, carbon and sulphur (NO_x , CO_2 , CO , Sox); particulate matter, photochemical oxidants, hydrocarbons, and ash and hydrogen sulphide. Apart from adverse effect on human health, animals, avoiding thermal pollution and noise from refineries, have moved far away into other parts of the forests. The fact the Ekpan villagers in Delta State lamented. Nigeria has about 100 gas flaring points; four flare points surround Out-Jeremi, which also has 42 oil wells. Out-Jeremi suffers high-level soil infertility; consequently, they hardly produce sufficient food for subsistence. Women engage in mat weaving more than they previously did. SPDC, which produces about 45 per cent of total gas flared in Nigeria plans to stop gas flaring in AD 2008. This implies that women who farm in areas with flare points will be deprived until then and are not sure that such farmlands will recover soon after stoppage of gas flaring. The Department of Petroleum Resources (DPR) of the NNPC regulates noise levels but the following locations, Sapele West, Egwa I, Odidi I, and Jones Creek exceeded DPR's limit. Again, smoke density values at Utorogu gas plant and flow station, Ughelli gas plant, Escravos flow station, Uzere and Osioka flow stations exceeded DPR's limit of 80 decibels (db) and 100-db upper limit. Human being in such areas can become hard of hearing too. If human beings are healthy, they perform better economically. Explosives used during seismic surveys also result in noise pollution that adversely affects wildlife for protein as well as the hearing ability of the local population. Acid rain is partly attributed to gas flaring and this corrodes corrugated Aluminium roofing sheets on houses, acidify the soil (loss of soil fertility) and damage crops.

The issue of coastal and riverbank erosion as well as seasonal flooding are of great challenge to women in the Niger Delta. Not only do these reduce available land for agriculture, housing, playgrounds and other activities, women have been forced to prematurely harvest their crops and subsist over long period without alternative stable economic source. Often time's unplanned canalization and sand dredging aggravate coastal erosion and facilitate the movement of tidal currents inland to assail the environment. Olukoju (1998) noted this impact on Awoye and Milam communities of Ondo State, where women's fish farming activities have been reduced. In Bonny, sand dredged from near shore for construction of houses for persons displaced by the NLNG project caused shoreline retreat as the equilibrium of the beach with the inner continental shelf was disturbed. Again, as the turbidity of water and the level of suspended matter increase, the gills of fishes are clogged, mortality rate of fish fingerlings increase, as such fishing is adversely affected. These clogs damage fishing gears apart from reducing the quantity and quality of the haul.

The uncontrolled activities of loggers, indiscriminate fuel wood harvest, bush burning and felling of tree for furniture and other crafts aid deforestation. It is traditional that women harvest Ogbono (*Irvingia gabonensis*), oil bean seeds, breadfruit (ukwa) and other fruits for livelihood. If these trees are felled without planned replacement then they are deprived of their economic resources, and this is often the case. In the face of this challenge, women need to dialogue with their community leaders for effective monitoring and control. Apart from this, there is the need for conscious cultivation of these trees for sustainable economic activities.

The Millennium Challenge

Women have become increasingly aware of their roles in society as they form a variety of organizations and actively participate in political leadership in order to contribute meaningfully to the overall development of their societies. It is in this context that it has become imperative for them to develop strategies to cope with these environmental challenges. Thus, knowledge of environmental laws, whom alert when there is an incidence of oil pollution and enforcement of clean-up becomes crucial. Women groups should assert their presence in their various communities, relate cordially with the leadership so that they are fully and actively represented among delegates to oil companies, other industrial outfits, government, persons and so on that degrade their environment. Women should also be sensitive to any unplanned canalization, deforestation, and biodiversity loss. Through dialogue, peaceful protest and affirmative actions, positive results can be attained.

Women co-operatives can raise loans and establish fish farms, periwinkle farms, prawn and shrimp farms, snail farms, rabbitery, and so on, on a long term basis and with modern techniques for economic sustainability. With awareness campaigns and scholarship scheme, young women can be encouraged to study Agricultural Economics and Extension so that they can service women organization, which traditional norms may prevent from benefiting from male extension officers. They can also establish zoos and model farms in order to check loss of biodiversity.

Provision of rural infrastructure such as good network of roads, electricity and portable drinking water would make women less dependent on mangrove and other trees for generations of fuel (since fuel and kerosene can be easily transported on good roads) and more time will be saved sourcing for drinking water. Women groups can establish fuel stations (even a mini-type with large tanks) to ensure regular supply. In this regard, there is need for attitude change towards the establishment and others to provide these services for them.

Women can and should assist in checking pollution of rivers, creeks and ponds (around them) with sewage and garbage. They can form vigilante groups, enlighten members of their communities and develop other ways of disposal that are not harmful to aquatic life. There is a need for women to organize workshops, seminars and conferences regularly so that all and sundry will be acquainted with environmental issues. In this way, they complement the activities of government and other agencies in this regard.

Conclusion

There are several activities in the Niger Delta that engender a degrading of the environment upon which women depend for their livelihood and other activities. Consequently, the following issues arising from human activities and natural occurrences noise pollution, coastal and river bank erosion, flooding, loss of biodiversity. Land degradation and deforestation among others pose great challenges to women in the region.

Given these challenges, women awareness and active involvement in development projects and programmes, the third millennium is now period for affirmative actions towards the development and sustainability of the Niger Delta environment. Women have to generate funds, form active and effective co-operative societies to establish projects using modern techniques and equipment for economic sustainability among others. They can establish fish, periwinkle, snail, prawns, shrimp, crab, oyster, rabbit farms and zoos, fuel and kerosene stations/depots, craft industries, and so on.

Women need to assert themselves in their communities and participate actively in politics at all levels, form vigilante groups, engage in peaceful protests, arm themselves with environmental laws and enlighten the masses on environmental issues. In this Way, they can achieve greater relevance and play more roles in the development of the Niger Delta