

Diversification of Livelihoods and income levels in oil-producing communities in the Niger Delta Region, Nigeria

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Abstract

The environmental impacts of oil pollution in the Niger Delta region cut across the three spheres of air, water and land. The resultant adverse economic impacts are felt more in farming and fishing have given their dominance in the main traditional livelihood activities in the region. This becomes a strong reason for affected local people to diversify their livelihood activities as a coping strategy. Using the sustainable livelihood framework, this study examined the diversification of livelihoods and income levels in oil-producing communities in the Niger Delta Region. A cross-sectional research design was adopted in this study. The research was carried out in six communities in the three states with the highest prevalence of oil pollution in the region, namely; Oruma, Aguobiri in Bayelsa State; Ido, Bille in Rivers State; and Egwa 1, Tebujoh in Delta State. Data were obtained through primary and secondary sources. The simple random sampling technique was used to select households from which 400 respondents were drawn for the study and the data collection instruments used were Questionnaire schedules, focus group discussions and key interview informants. Based on the data analysis, findings from the study showed a positive relationship between livelihood diversification and income. The implication of this is that the more the level of livelihood diversification the more the income. Hence the study recommends that the government and other stakeholders should improve the capital assets of farmers and fishers to enable them to adapt to the vulnerabilities of oil pollution.

Keywords: Diversification; Income levels; Livelihoods; Oil-producing; Niger Delta

Introduction

In the advent of declining resources due to threat to livelihoods, affected rural households may device means to diversify their livelihood activities. Kassa (2019), identified livelihood diversification strategies in Ethiopia such as farm, on-farm and off-farm, though he identified on-farm activities as the most practised. Diversifications may involve agricultural or non-agricultural livelihoods. Rural livelihood diversification means the act of expanding livelihood activities by rural households in a bid to raise their standard of living to cushion the limitations associated with the reliance on a single mainstream economic activity. It is a non-stop coping process that involves embarking on supplementary livelihoods in addition to the existing one or completely moving away from existing ones for new livelihood activities all in a bid to increase

sources of livelihood (Ellis, 2000). Fikru (2008), adduced that complementary livelihood activities increase productivity and reduce poverty. He explained that non-agricultural activities create more employment, reduce rural-urban drift in search of work and increase economic growth.

He also explained that the more diversification by households, the more income that will accrue to them. This implies that diversification increases sources of income leading to an increase in growth and standard of living. Diversification implies operating varieties. According to Awoniyi and Salman (2012), agricultural households that do not combine non-agricultural activities are more prone to poverty when viewed within the context of those engaged in non-agricultural income fetching activities. Just like Kassa (2019), Ellis (2000), had also shared the view that livelihood activities are of three categories, on-farm, non-farm and off-farm. While on-farm activities are directly related to agricultural activities, non-farm activities take place outside the agricultural sector. Off-farm activities are agricultural activities that are completely off the agricultural wage of households. Jack (2019), averred that due to oil pollution, several households who are engaged in Traditional livelihoods in the Niger Delta region such as fishing and farming are abandoning same due to poor economic returns caused by oil pollution. He also stressed that diversification of livelihood by farmers and fishers significantly promote income. Oil exploration and production activities in the Niger Delta region account for severe oil spills and pollution. The incidence of oil pollution reflects mishaps that are disasters that occur in regions where crude oil exploration and production takes place leading to monumental devastation of the environment all year-round if not effectively regulated.

In addition to oil pollution, other activities associated with the petroleum industry tend to undermine the environment of the people. For instance, the expansionary nature of the petroleum industry since the 1950s has contributed significantly to massive deforestation in the Niger Delta. The region has an expansive crossing of pipelines for oil movements leading to massive vegetation destruction. Areas that earlier had rich forests now have oil well heads, pipelines & flow stations (Mirza, 2003). Apart from the activities of multinational companies, pollution also stems from oil bunkering activities and artisanal oil refining (UNEP, 2011). UNEP in its 2011

report identified artisanal refining and oil bunkering as major sources of contamination in the region. The report further averred that the release of hydrocarbon into the atmosphere by these various sources leads to environmental depletion due to the production of pollutants that are harmful to traditional livelihoods tied to land and water. The report also indicated that the forestry sector is in jeopardy because the forests are devastated just as fishes are almost depleted since fish has the propensity to migrate from polluted waters to less polluted areas. Also, crops in hydrocarbon ravaged areas are damaged. Even the recommencement of farming on such affected areas often produces low yields as against unaffected areas. UNDP affirmed that over 60% of those dwelling in that region rely on their physical surroundings for survival. Oil pollution varies in scope and content due to the differences in the spills in relation to the nature, context and circumstances leading to the release of petroleum products into the environment. Also, to be considered are the resource at risk, and how people respond to the spill (Wiens, 2013). Even though the presence of crude oil floating on the water surface seemingly reduces, a large chunk of the spilt oil will still be present under the surface leading to another dimension of the problem. Spill affected areas are covered with toxic infected products which affect the future of the affected area. Also, the dissolved oil produces dangerous compounds that cause water, land and air pollution that contaminates the soil and groundwater (Petrosense, 2015).

When the oil is spilt into the ocean or river, animals and plants are harmed. One major effect of an oil spill is the washing away of shorelines caused by oil exploitation and exploration activities. With the expansion of oil production in the Niger Delta region, the incidence of oil spills has greatly increased (Akpofure, 2008). Spilt oil which is retained in the environment exposes plants and animals to degradation especially in the case of non-moving water. In the case of flowing streams and rivers, the oil collects on plants and grasses growing on the banks and also interacts with sediments, thereby affecting the organisms. If a stream that provides potable water is affected by a spill in an area, the inhabitants will suffer potable water shortage (Egbe & Thompson 2010). This is in addition to associated health challenges when used by people. Oil spills and pollution occur in the Niger Delta region in the course of oil exploration and production activities. The causes are broken down as follows: Tanker accidents (50%), sabotage (28%) and oil production operations (21%). Inadequate or non-functional production

equipment accounts for 1% of the spills, i.e. corrosion of pipelines and tankers leading to rupturing or leaking of old unmaintained production equipment (Nwilo & Badejo, 2001).

Oil spill occurrences are pervasive in the Niger Delta region. Edoho (2008), puts the estimated quantity of spills in the region at 2,567,906 barrels from 5733 incidents of spills from 1976-2000, cumulatively surpassing the Exxon Valdez spill by almost ten times. The effect of oil spills and pollution in the Niger Delta is quite alarming because they affect terrestrial ecosystems, shorelines, swamps, defoliation and mortality of existing mangroves, fish, turtle etc. According to Osuji and Opiah, (2007), sometimes, contamination of soil results from floating oil stick on water being blown by wind and wave to shorelines. They noted that onshore and close to shore oil contaminates the terrestrial ecosystem and that all these leads to a shortage of fish and agricultural products which are key to livelihoods of the affected communities. Another dimension to the effects of oil spillage is the occurrence of bush fire caused by the explosion of oil tankers during bunkering or pipeline vandalization. This also, has a devastating effect on agriculture, water and biodiversity. According to a report released in 2009 by Amnesty International, oil spills, waste dumping and gas flaring by oil companies has been ongoing in the Niger Delta for several years. The study revealed that oil spills figures are not properly assessed and evaluated to know the scale of pollution and environmental devastation.

Theoretical Framework

The theoretical framework used in this study is the Sustainable Livelihood Framework. Carney, (1998) highlights various assets namely, human, social, natural, physical and financial capitals that are used in diverse ways by people to tackle eventualities like shocks and stress within the context of external vulnerability caused by external shocks and other factors. The interplay of these assets, underlie or undermine the wellbeing of households in terms of sustainability. The ability or capacity of individual households determines livelihood strategies and acquisition of the assets. Households are required or needed to combine these assets in a bid to have a decent standard of living. Oil pollution affects these assets adversely and thus households become vulnerable to poverty due to poor agricultural yields. This diminishes the socio-economic life of households in communities that are affected by oil pollution. Oil pollution, within the context of

vulnerability, emanates from human activities. These activities create adverse impacts on the environment as well as on the livelihoods of the affected communities. Unsustainable oil exploration and production activities have severely damaged the ecosystem and livelihood assets of people living in the Niger Delta region. Part of the strategy adopted by rural households in the affected communities to cope with the underlying problems of assets depletion is diversification of livelihoods. The impact of oil pollution is felt in all the spheres of the environment namely; air, water and land. A combination of these spheres of impact with regard to oil pollution presents a compound situation where the totality of the environment of the region is endangered. This is seen in the form of contamination of the air, soil and waters through pollution, causing the destruction of farmlands and crops, destruction of rivers and fishes, destruction of forest resources, biodiversity, deforestation, loss of aesthetic and vegetation cover. This creates food insecurity. The nexus between rural households and socio-economic, political and environmental conditions depends on the availability of the various assets, human, social, natural, physical and financial capitals. These are used in diverse ways by people to tackle eventualities like shocks and stress within the context of external vulnerability caused by external shocks and other factors which in this regard is majorly oil pollution. Oil pollution adversely affects the assets leading to a reduction in the quality of livelihood pattern in the region, thus causing traditional livelihoods to be unsustainable. Livelihood is sustainable if it possesses the enabling capabilities and assets to cause those yet unborn to have sustained opportunities (Chambers & Conway,1992).

Materials and Methods

The research design adopted in the work is the cross-sectional research design carried out in six communities in three states with the highest prevalence of oil pollution in the region, namely; Oruma, Aguobiri in Bayelsa State, Ido, Bille in Rivers State, and Egwa 1, Tebujoh in Delta State. Data were obtained through primary and secondary sources. While a simple random sampling technique was used to select households for the study, data collection instruments were Questionnaire schedules, focus group discussions and key interview informants were also used. The sample size was 400. The analysis was based on the usage of the Statistical Package for Social Sciences (SPSS, version 22.0). The sample size of 400 was distributed proportionately

among the communities based on their populations. 314 respondents actively participated in the research. To identify the efficacy of diversification and or otherwise, the correlation between livelihood diversification (sources of respondents' income) the average monthly income of respondents was tested, using the Spearman Rho coefficient. The test showed a weak positive relationship between livelihood diversification and income. This shows that the more the level of livelihood diversification the more the income. The sample size of 400 was derived based on Taro Yamane sample size formula:

$$n = \frac{N}{(1+N(e)^2)}$$

Where:

n = sample size

N = total population

e = level of significance (0.05)

1 = constant

Findings and Discussion

Socio-economic circumstances of Rural Households in the Niger Delta Region

The impacts of oil pollution in the Niger Delta region are felt in the three environmental spheres of air, water and land. This represents a compound case of environmental pollution for the region. The resultant adverse economic impacts are felt more in farming and fishing, forest and biodiversity, household items and occupational tools. 17.2% of the respondents strongly disagreed with the fact that oil pollution impacts negatively on livelihoods. 24.2% disagreed, 7.0% were undecided, 9.6% agreed while 42.0 strongly agreed. The responses obtained from respondents in the study locale showed concern for the level of destruction of farms and crops caused by oil pollution. Communities in the freshwater areas that have farming as a major livelihood activity dwelt more on this. Communities in freshwater areas engage in both farming and fishing.

While both men and women engage in fishing, women do more of the farming. The change of the ecosystem for the worst due to oil pollution is agonizing to these rural dwellers. Farming is

basically for subsistence purpose and the surplus is usually channelled into commercial use. Major crops produced are cassava, plantain, yam, cocoyam, sugarcane and corn. The riverine location of the communities in the study area has placed them at a naturally advantaged location for fishing. The strategic location of the communities gave them a comparative advantage for fishing. The oil-polluted water has made it difficult for fishes to breed. One of the predominant livelihoods of the Niger Delta people is fishing. Being mostly riverine communities, they are naturally placed to have an abundance of fish and other aquatic species. But this has been altered by the adverse effects of oil exploration activities and worsened by artisanal oil refining. The same communities now experience shortages with regard to fish and other aquatic foods. The dumping of wastes and oil spills into the rivers and creeks causes serious pollution. Men and women who engage in fishing catch less and as such, find it difficult to meet subsistence and commercial needs. Occupational tools are often destroyed by oil pollution. The research interviewees maintained that fishers often get their equipment destroyed by the polluted waters. Livelihood activities such as Lumbering, Palm wine tapping, Canoe carving, Hunting and Palm oil production are also affected by oil pollution. The degradation of the forests (deforestation) has economically affected practitioners of the above-indicated livelihoods. The destruction of mangrove forests has led to the near depletion of periwinkles and crabs.

As earlier stated, farming and fishing are mainly for subsistence purposes, though surpluses are sold to raise income. The respondents complained of the high cost of food and fish due to the prevailing environmental degradation caused by oil exploration and production activities, worsened by artisanal crude oil refining and oil bunkering. They averred that the prevailing circumstances have made farming and fishing to be less inspiring to several persons due to the attendant food shortages and low financial capital amongst the practitioners. They pointed out that these traditional livelihood activities were more profitable in the past and that the situation was getting worse by the expansion of oil exploration and production activities in the Niger Delta communities.

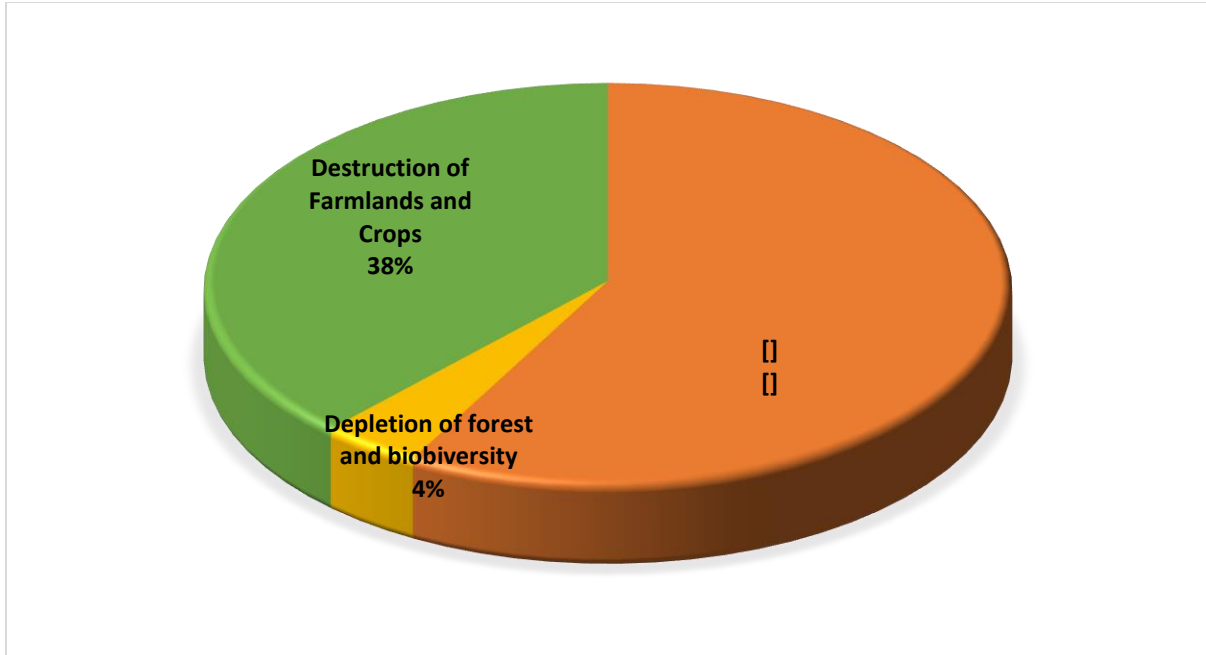


Figure 1: Showing the impact of Oil Pollution on Livelihoods

Figure 1 above, shows the impact of oil pollution on livelihoods. The resultant devastating economic impact of artisanal refining is felt more in farming, fishing, forest and biodiversity, as well as household items and occupational tools. While 19.7% of the respondents indicated the destruction of farmlands and crops, 29.9% indicated the destruction of rivers and fisheries. Also, 1.9% indicated the depletion of forest resources and biodiversity. The economic impacts of pollution are felt more in farming and fishing, forest and biodiversity, household items and occupational tools. While the impact on farming manifests in shortage of food items, low crop yield, low income, high cost of food, general food insecurity, reduction in spending, loss of livelihood, the impact on fishing comes in the form of shortage of fish, low income, high cost of fish, loss of livelihood and reduction in spending. Economic impact on forest and biodiversity leads to depletion of animals and economic trees, reduction in hunting, loss of livelihood and low income.

In the advent of declining resources due to threat to livelihoods, the affected local people device means to diversify their livelihood activities while deliberate attempts are made to cut-down consumption. These diversifications may involve non-agricultural livelihoods. The study showed

various alternative occupation. The alternative occupations highlighted in the study, include palm oil processing (1.8%), canoe carving (2.5%), Ogbono picking (10.8%), snail picking (2.9%), trading (12.7%), sale of petroleum products (6.1%), farming (15.3%) and fishing (40.8%). It was noted that some respondents combined fishing and farming to adapt. Some combine more than one or two supplementary occupations. The combination of two or more livelihoods is subject to the capacity and capability of the persons involved. Below are extracts from FGD sessions.

Fish has drastically reduced because of oil pollution. Periwinkles and crabs have also reduced. The reduction of these commodities has kept us with less money (FGD/TEBUJOH).

Land pollution caused by oil companies and artisanal oil refining contaminates the soil. This affects farmlands and crops leading to loss of livelihoods and income. (FGD/ORUMA).

Diversification by Income levels

Table 1: Cross Tabulation of Diversification by Income

Diversification	INCOME				Total
	<10,000	N10,000- N30,000	N31,000- N50,000	N51,000 and Above	
Agriculture only	18(75.0)	50(75.8)	64(55.2)	50(46.3)	182(58.0)
Non-Agriculture	0(0.0)	14(21.2)	22(19.0)	40(37.0)	76(24.2)
Agriculture and Non-Agriculture	6(25.0)	2(3.0)	30(25.9)	18(16.7)	56(17.8)
Total	24(100.0)	66(100.0)	116(100.0)	108(100.0)	314(100.0)

Source: Field survey, 2019

Results, as shown in Table 1, indicate that 75.0% of respondents who are solely dependent on agricultural sources of income, earn below N10, 000 a month, 75.8% earn between N10, 000 - N30, 000, 55.2% earn between N 31, 000 – N 50, 000 and 46.3% earn up to N51, 000 and above. For respondents who solely depend on non-agricultural sources of income, whereas none of them earns below N 10, 000 monthly, 21.2% earn between N10, 000 - N30, 000, 19.0% earn between N 31, 000 – N 50, 000 and 37.0% earn N51, 000 and above. For respondents who combine both agricultural and non-agricultural sources of income, it shows that 25.0% earn below N 10, 000

monthly, 3.0% earn between N10, 000 - N30, 000, 25.9% earn between N 31, 000 – N 50, 000, while 17.8% earn N51, 000 and above.

Test of Hypothesis: There is a significant relationship between livelihood diversification and income.

Table 2: Spearman Rho Correlation Test of Hypothesis

		Livelihood Diversification	Average Monthly Income of Respondents
Spearman's rho	Diversification	Correlation Coefficient	1.000
		Sig. (2-tailed)	.196**
		N	.000
		N	314
INCOME		Correlation Coefficient	.196**
		Sig. (2-tailed)	1.000
		N	.000
		N	314

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field survey, 2019

Table 2 presents the Spearman Rho correlation between livelihood diversification (sources of respondents' income) and the average monthly income of respondents. The Spearman Rho correlation produced the following result: $r = 0.196$, $p = 0.000$

This means that the test produced a correlation of 0.196 and a p-value of 0.00 hence the test is statistically significant and the null hypothesis is thus rejected. There is therefore a positive relationship between livelihood diversification and income. This shows that the more the level of livelihood diversification the more the income. This is in line with Fikru (2008), assertion that complementary livelihood activities increase productivity and reduce poverty and that non-agricultural activities create more employment, reduce rural-urban drift and increase economic growth. He explained that the more diversification by households, the more income that will accrue to them. Our findings are also in tune with the study of Jack (2019) that due to oil pollution, several households who are engaged in traditional livelihoods in the Niger Delta region such as fishing and farming are abandoning same due to poor economic returns. And that

diversification of livelihood by farmers and fishers significantly promotes income. Some of the interviewees have this to say:

I am a farmer. I am also involved in fishing and I sell petroleum products too. (KII/CBO REP/AGUOBIRI)

Relying on fishing alone will be disastrous so I do trade and thrift business to survive with my family (KII/CBO REP./ IDO)

Some persons in the community have added other livelihood activities to their original livelihoods as a means of diversification to add to the low income from farming and fishing. Some persons now sell all these fuel and kerosene to survive. (FGD/TEBUJOH)

Some of the livelihood activities people do are petty trading, menial jobs, boat hiring services, etc. Some persons who were doing only farming or fishing in the past now combine both of them. (FGD/ORUMA)

Conclusions

This study examined the diversification of Livelihoods and income levels in oil-producing communities in the Niger Delta Region of Nigeria. It is apparent that rural households in the region are increasingly diversifying their livelihoods. Declining resources due to threat to livelihoods by oil pollution had compelled several rural households to devise means to diversify their livelihood activities. The diversification is in three folds: agriculture only, non-agriculture only and both agriculture and non-agriculture. The economic impacts of oil pollution are felt more in farming and fishing. While the impact on farming is reflected in shortage of food items, low crop yield, low income, high cost of food, general food insecurity, reduction in spending, loss of livelihood, the impact on fishing comes in the form of shortage of fish, low income, high cost of fish, loss of livelihood and reduction in spending. To identify the efficacy of diversification and or otherwise, the correlation between livelihood diversification (sources of respondents' income) and the average monthly income of respondents was tested, using the Spearman Rho coefficient. The test showed a positive relationship between livelihood diversification and income. This shows that the more the level of livelihood diversification the more the income.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

- i. The government and other stakeholders should, therefore, improve the capital assets of farmers and fishers to enable them to adapt to the vulnerabilities of oil pollution through diversification of livelihoods. Credit facilities should be extended to rural households who cannot diversify.
- ii. Compliance to existing environmental laws by oil prospecting and production companies should be enforced to ameliorate oil pollution. Artisanal crude oil refining and bunkering should be stopped to avoid further deterioration of the environmental and livelihood crisis in the region.
- iii. The government should embark on regular environmental remediation exercises to clean up oil spills in the region.
- iv. The government should strongly consider the urgent provision of physical capital assets such as roads, electricity, modern market, micro-finance banks, drinking water to help stimulate the adaptive capacities of rural households.
- v. Operating oil companies should institute efficient corporate social responsibility schemes to engender training of rural households on diversification methods, new techniques on agriculture and the provision of fertilizers and fish feeds.
- vi. To avoid the complete abandoning of traditional livelihoods, the government should aid the diversification efforts of rural households to non-agricultural activities while maintaining their traditional occupations to avoid food scarcity. This can be achieved through extension services, compensation for agricultural losses incurred due to oil pollution and the provision of preservation facilities for agricultural products.

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