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Implication of the Niger River Dredging on the Livelihood of Arable Farming Households in Niger State, Nigeria

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Abstract

Over the years, efforts have been made to improve the living conditions of the rural poor with the government embarking on different projects some of which are questioned even by the intended beneficiaries. The Federal Government of Nigeria in 2009 embarked on the dredging of the Lower Niger River some 573 kilometres upstream from Warri in Delta state to Baro in Niger State, Nigeria with the intension of promoting economic activities in the country. Considering the huge amount of money invested in the project, this study was carried out to examine the impact of the project on the socioeconomics of arable farming households in the study area. A simple random sampling technique was used to select 60 respondents for the study after which a well-structured questionnaire was used to collect data from them. Descriptive statistics and the Sustainable Livelihood Framework were the major analytical tools used for the study. Results of the study showed that on the overall, the project has a positive impact on the livelihood of the respondents though not without some negative effect. The study therefore recommends that in the future adequate compensation should be paid to the Project Affected People who had their assets destroyed and their livelihood negatively affected as a result of the project. Also, sufficient and proper assessment should be done before embarking on the execution of the project such that enough provision is made to cushion its negative effect.

Keywords: *Sustainable livelihood framework, dredging, impact, lower Niger river, Warri*



Introduction

Nigeria has a population of 150 million, the largest in Africa and a fast-growing economy. Agriculture is the mainstay of the economy, contributing about 45 per cent of GDP. The agricultural sector employs about two-thirds of the country's total labour force and provides a livelihood for about 90 per cent of the rural population. Poverty is especially severe in rural areas, where up to 80 per cent of the population lives below the poverty line and social services and infrastructure are limited. The country's poor rural women and men depend on agriculture for food and income. About 90 per cent of Nigeria's food is produced by small-scale farmers who cultivate small plots of land and depend on rainfall rather than on irrigation systems (IFAD, 2009). Over the years, efforts have been made to improve the living conditions of the rural poor with the government embarking on different projects some of which are questioned even by the intended beneficiaries. One of such project is the dredging of the river Niger.

Dredging as defined by the International Association of Dredging Companies is the relocation of underwater sediments and soils for the construction and maintenance of waterways, dikes and transportation infrastructures and for reclamation and soil improvement (PIANC, 2005). Dredging is vital to economic and social development and to the construction and maintenance of some of the infrastructure upon which our economic prosperity and social well being depends (PIANC, 2005). Dredging can be categorised into two types namely, capital (new) and the maintenance dredging projects. Capital or new dredging projects can be both extensive and expensive while the maintenance dredging is often a regular and perhaps annual ongoing, long-term activity. The dredging process consists of three elements which include: excavation, transport of excavated material and utilisation or disposal of dredged materials. The dredging process is usually associated with direct or indirect environmental effects which may be positive or negative, short term or long term. The quality of water, topography and other physical processes are all affected by dredging activities (PIANC, 2005)

The age-long plan to dredge the Lower River Niger in Nigeria was first conceived by the colonial administration in 1958. After over 44 years in incubation, the dredging of River Niger was flagged off on September 10, 2009 (Leadership, 2012). River Niger is one of the major rivers in Nigeria; it plays an essential role in the life of the people in communities where it passes through. It is an important waterway both for navigation associated with active trading and for small canoe traffic over the whole of its course. The riparian, rural populations benefit from its important fish resources. Its floodplains and floodplain tributaries in the inner delta are used for the



cultivation of rice, cotton and wheat. In addition, the floodplains are vital to the cattle-herding nomads who use the access to water and the pastures that are created a new every year as the water recedes, giving the river a significant economic role (Welcomme, 1985).

The dredging of Lower River Niger cuts across eight cooperating states and 152 communities. The states include: Delta, Bayelsa, Rivers and Edo states; others are Imo, Anambra, Kogi and Niger states. The 572 kilometre-long dredging covers Baro in Niger State to Bifurcation in Bayelsa State with recurrent (maintenance) dredging which has to do with maintaining a minimum channel depth of 2.5m and a top width of 100m for all-year-round navigation (Leadership, 2012). The dredged river is expected to provide all-year round navigation, employment opportunities, and improved economic activities as well as flood control. The project is divided into five lots by the National Inland Waterways Authority (NIWA) using natural boundaries. They are also of different mileages as follows:

Lot 1: Warri to Bifurcation	154 km
Lot 2: Bifurcation to Onitsha	116 km
Lot 3: Onitsha to Idah	118 km
Lot 4: Idah to Jamata	108 km
Lot 5: Jamata to Baro	76 km

The original contract sum for the project was ₦34, 806,353,521.00 (\$221,696,519.24 at an exchange rate of ₦157 to a dollar) but was later augmented by the sum of ₦8, 528,358,812.00 bringing the total sum of money budgeted and approved for the project to ₦43,334,712,332.00 (\$276017276.00 at an exchange rate of ₦157 to a dollar) (People's Daily, 2011).

Though the major objective of the dredging of the lower River Niger is to ensure that navigational channel is kept open throughout the year with sustainable improvement in water-borne transport in Nigeria, it nevertheless has a multiplier effect on the livelihood of the arable farming households in the affected areas.

Problem Statement

The dredging project before its commencement witnessed different shades of criticisms from within and outside the country. Dredging and dredging activities are known to be accompanied by ecological impacts including damage and often irreparable consequences to the flora and fauna coastal topography and impairment of water quality (Ade Sobande and Associates, 1998, Ohimain et al., 2002). Dredging in sensitive ecosystems may have serious impacts if not well managed particularly the dredge



spoil which pollute or contaminate disposal sites (van Dessel and Omoku, 1994). Given that rural infrastructure in Nigeria has long been neglected with very low Investments in health, education and water supply such that the rural population has extremely limited access to services such as schools and health centres, and about half of the population lacks access to safe drinking water with a sizeable number of the nation's population living below poverty line and considering the expensive nature of the project, the need to assess the impact of the dredging project on the farming household is of economic relevance to policy makers for planning purpose and for better execution of future project. According to (Salu, 2000), though the Environmental Impact Assessment (EIA) of the project was carried out prior to its commencement, however, contrary to federal law the intended beneficiaries were not consulted or even contacted during preparation of the federal EIA report. The need for an independent assessment of the impact of the project on the livelihood of arable farming households in the area can therefore not be overemphasized.

In view of this statement, this study was carried out to achieve the following objectives:

1. To examine the socio-economic characteristics of the household farmers in the study area,
2. To investigate the effect of the Niger dredging project on the livelihood of the farming household.

Justification

Arable farmers and traders form an extensive and growing group of entrepreneurs that are likely to be affected by the dredging project. They serve as agents of economic development in the otherwise remote area. The purpose of the project is to promote the economic development of the country, especially Northern Nigeria. A number of concerned communities along the proposed waterway and throughout the Niger Delta have voiced concerns about its potential environmental, social, and economic impacts. While dredging projects may have proven to be successful in many countries, there is however a real need to study how and in what way it affects the livelihood of the farming households in the project area so as to justify any investment in the project. (Barbara and Charles, 2001) presenting empirically supported evidence and scientific uncertainties concerning the effects of marine dredging activities on fish and shellfish populations in Washington State concluded that dredging activities have short and long term effect on the marine habitat. Given that many dredging projects (oil and gas) have been carried out in the Niger



Delta region for many years, most of which had left serious implications unsolved in the entire area, among these are Escravos Ugborodo, Bonny etc. In this paper, the impact of the dredging of the River Niger on the livelihood of arable farmers in the study area is studied. Examining the impacts and impact pathways of different types of government project is essential to guide future projects in ways that will make the greatest contribution to poverty reduction. Impact assessment of public project has always been viewed as an important activity to ensure accountability, maintain credibility, and improve internal decision-making processes and the capacity to learn from past experience. Impact assessment of the project will be useful in defining priorities of the project sponsors and facilitate resource allocation among programs diffused into farming communities, and show evidence that the intended beneficiaries really benefits from government projects.

Theoretical Framework

The Sustainable Livelihood Framework

The study will be based on evaluating the project in terms of relevance, acceptability, and impact on livelihoods. Conceptually, "livelihoods" connote the means, activities, entitlements and assets by which people make a living. Assets, in this particular context, are defined as not only natural/biological capital but also social physical, human and financial capital. Rural people's livelihoods depend on their livelihood assets (see Figure 1); Understanding the impact of the dredging project on people's asset is a key step in sustainable livelihoods analysis. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Ian Scoones, 1998). Rural livelihood strategies are often heavily reliant on the natural resource base. The framework for the analysis of sustainable livelihoods presented in this paper provides a holistic and integrated view of the processes by which people achieve (or fail to achieve) sustainable livelihoods being the aftermath effect of the dredging project (Figure1). The key for any intervention in support of sustainable livelihoods is to identify the institutional matrix which determines the major tradeoffs (between, for example, types of 'capital', livelihood strategies and sustainable livelihood outcomes) for different groups of people and across a variety of sites and scales and so the variety of livelihood pathways available. may help in such an investigation by acting as a simple checklist of issues to explore, prompting investigators to pursue key connections and linkages between the various elements. While it offers no predictive



power, it hopefully encourages the right sort of questions to be asked. The sustainable livelihoods approach emphasises getting the institutional and organisational setting right, with emphasis on both formal and informal mechanisms. Such an approach will hopefully improve the effectiveness of conventional interventions, as well as extending the range of options across livelihood strategies. The sustainable rural livelihoods framework (SRLF) was therefore adapted and used in assessing the impact of the dredging of the lower Niger River on the livelihood of the farming household in the study area. The tool developed by DFID is a way of thinking about the objectives, scope and priorities for development, in order to address poverty (Ashley and Carney, 1999). It operates on an understanding that people operate within systems: household systems, community systems, social systems and, in particular, livelihood systems. Starting with people and the way they live their lives, SRLF seeks to find practical ways to investigate individual and collective social and economic advancement, to organize information relevant to that advancement.

The SRLF is used by a growing number of research and applied development organizations, including the Department for International Development (DFID) of the United Kingdom (one of its most ardent supporters), the United Nations Development Program (UNDP), as well as nongovernmental organizations (NGOs) such as CARE and Oxfam (DFID 1997; Ashley and Carney 1999, Kerr and Kolavalli 1999; Adato and Meinzen-Dick 2002). Balgis, Nagmeldin, Hanafi and Sumaya (2000) also used the Sustainable livelihood approach to assess community resilience to climate change in Sudan.

The SRLF draws on a number of theoretical and conceptual approaches to development thinking; in this sense, it is a holistic and synthetic framework rather than an entirely new set of concepts. What the framework does is to provide a method for thinking about the multiple and interactive influences on livelihoods without overlooking important explanatory factors. The SRLF brings in many considerations that are often not included in an impact study (Adato and Meinzen-Dick 2002). In impact assessment, the assets upon which people build their livelihoods are of particular interest. This includes a wider range of assets than are usually considered. Typically, assets are divided into five categories: human, social, financial, physical and natural (Carney, 1998). The SRLF suggests consideration of an asset portfolio of five different types of assets and are given below:

Natural capital: consists of land, water, pasture, and biodiversity, and wildlife. Productivity and access to these resources may be degraded or improved as a result of the dredging project.



Financial capital: Consists of stocks of money or other savings in liquid form. It includes income levels, variability over time, and distribution within society of financial savings, access to credit, and debt levels.

Physical capital: Is that created by economic production. It includes infrastructure such as roads, irrigation works, electricity supply, reticulated equipment, housing and also producer goods such as machinery

Human capital: is constituted by the quantity and quality of labour available. At household level, therefore, it is determined by household size, but also by education, skills, and health of household members.

Social capital: Any assets such as rights or claims that are derived from membership of a group. This includes the ability to call on friends or kin for help in times of need, support from trade or professional associations (e.g. framers' associations) and political claims on chiefs or politicians to provide assistance (DFID, 1998).

Fig. 1: Research theoretical framework

As shown in fig 1, the theoretical framework was developed based on how the stocks of the different capital would be affected by the dredging project directly or indirectly and consequently the livelihood of the farming household

The Study Area

The study was carried out in Baro. Baro is a town about 54 kilometres away from Agaie town; the headquarters of Agaie Local Government Area in Niger State. The town is 400 miles (650 km) from the sea. Originally a small village of the Nupe people, it was selected by the British as Nigeria's link between rail and river transport and has a population of about 6059 people (Wikipedia). Baro port was used in colonial days to transport goods by ship to foreign countries through River Niger and from overseas to Nigeria. A railway line terminus (Minna-Baro) exists where goods were transported from the hinterland to the port for export and vice versa. The major occupation of the people is crop and fish farming. Cassava, rice, yam and plantain are the main crops grown in the area.

Sampling Method

The target population for the study are small scale arable farmers in Agaie Local Government Area of Niger State. A simple random sampling Technique was used to obtain a representative sample for the study. Sixty respondents were randomly selected from the list of households in the dredged area.



Results and Discussion

Socio-economic characteristics

A summary of the socio-economic characteristics of the dry season tomato farmers is given in table 1

Table 1: Summary of the socio-economic characteristics of the respondents

Characteristics	Frequency	Percentage
Gender		
Female	8	13.33
Male	52	86.67
Total	60	100.00
Age of Respondents(years)		
21-30	16	26.67
31-40	13	21.67
41-50	17	28.33
51-60	9	15.00
>60	5	8.33
Total	60	100.00
Marital status		
Married	49	81.67
Single	5	8.33
Widow/separated	6	10.00
Total	60	100.00
Educational status		
No formal education	8	13.33
Quranic education	11	18.33
Primary education	7	11.67
Secondary education	10	16.67
Post secondary education	24	40.00
Total	60	100.00
Household size		
1-5 members	18	30.00
6-10 members	36	60.00
11-15 members	6	10.00
Total	60	100.00
Primary Occupation		
Farming	45	75.00
Trading	3	5.00
Civil Servant	12	20.00
Total	60	100.00



As shown in Table 1, approximately 87% of the farmers were males while only 13% of them were females. This indicates that farming activities in the study area is male dominated. The mean age of the respondents was 41.48. This implies that the farmers are relatively young and would therefore be active. The youngest farmer in the study area was 26 years and the oldest was 65 years. The study revealed that about 82% of the respondents are married. The mean house hold size was 7 persons and the modal family size was 6 to 10 members. The study also revealed that more than 50% of the respondents had at least a secondary education. This indicates that a good number of the respondents are educated and would therefore be conscious of their environment. 75% of the respondents have farming as their primary occupation with about 44% of them combined fish farming with arable farming and about 36% concentrated only on fish farming while the remaining 20% have arable farming as their primary occupation.

Effect of the Dredging project on the Livelihood of the Respondents

The sustainable livelihood approach was employed to analyse the effect of the dredging project on the livelihood of the farming households. The effect of the project on the natural capital of the farming households before and after the project is shown in table 2.

Table 2: Natural capital

Before the project			After the Project	
Characteristics	Frequency	Percentage	Frequency	Percentage
Area of land Cultivated(ha)				
0.5-1	8	13.33	42	70.00
1.1-1.5	10	16.67	11	18.33
>1.5	42	70.00	7	11.67
Total	60	100.00	60	100.00
Source of water				
Bore hole and Well	8	13.33	36	60.00
Well and River	19	31.67	11	18.33
River	27	45.00	9	15.00
Well	6	10.00	4	6.67
Total	60	100.00	60	100.00



The result of the analysis showed a drastic reduction in the area of land cultivated by the farmers after the project. Before the project, the average area of land cultivated by the farmers was 2.48ha with about 70% cultivating land area above 1.5ha. However, after the project the average area of land cultivated by the farmers was reduced to 1.23ha with only about 11% cultivating land area above 1.5ha. This may be as a result of the large mass of land occupied by debris that resulted from the dredging activities. The farmers nevertheless, got access to improved water quality as a result of the project. This is as a result of 4 new boreholes constructed in the area which is necessary for healthy farming households.

Financial Capital

The effect of the dredging project on the financial capital of the farming households is shown in table 3.

Table 3: Financial capital

Before the project			After the project	
Characteristics	Frequency	Percentage	Frequency	Percentage
Income per day				
N500-N1000	31	51.67	14	23.33
N1100-N1500	13	21.67	28	46.67
N1600-N2000	11	18.33	11	18.33
>N2500	5	8.33	7	11.67
Total	60	100.00	60	100.00
Other Sources of income				
Yes	16	26.67	48	80.00
No	44	73.33	12	20
Total	60	100.00	60	100.00

Table 5: Financial capital after the project

As shown on the table, the dredging project resulted in more income accruing to the farming households. The average income accruable to a household per day before the dredging was N788.48 with more than



half of the respondents (51.67%) earning less than ₦1000 per day. After the project however, income earned per day by the farming households on the average rose to ₦1388.76 with more than half of the respondents earning above ₦ 1000. This may be due to increased access to other sources of income apart from their normal farming activities which also help the farmers in purchasing quality farm inputs necessary to raise productivity. About 80% of the respondents became engaged in other economic activities apart from their primary farming occupation leading to increased income.

Social Capital

The effect of the dredging project on the social capital of the farming households is shown in table 4

Table 4: Social Capital

Before the Project			After the project	
Characteristics	Frequency	Percentage	Frequency	Percentage
Membership of Social groups				
Yes	27	45.00	47	78.33
No	33	55.00	13	21.67
Total	60	100.00	60	100.00
Access to loans				
Yes	26	43.33	43	71.67
No	34	56.67	17	28.33
Total	60	100.00	60	100.00

As shown in the table, the dredging project has a positive effect on the social capital of the farming households. Only 45% of the respondents claimed they were members of a social group before the dredging project commenced. However with the advent of the project, as much as 78% of the respondents claimed they are now members of cooperative societies. This could be as a result of the initial problems faced by the farming households at the commencement of the project which forced them to come together in a bid to solve their common problems. This later turned out to be beneficial to the farming households as members became more active in the society's activities and a good number of them (71.67%) now have access to loans.



Physical Capital

The presence of the project in the study area has lead to improved social amenities in the study area. The government in a bid to ensure peace in the study area and cushion the effect of the project on the livelihood of the farming households built a hospital and ensured improved electricity supply. This was acknowledged by all the respondents. Unexpectedly however, about 70% of the respondents claimed the presence of the project in the study area has lead to an increase in the cost of transportation rather than reduce it. This may be as a result of increased economic activities in the area and non commencement of transportation through the water. Before the project, only about 38% of the respondents claimed they obtained their inputs particularly improved seeds from the State's Agricultural Development Projects (ADP). This however increased to about 79% after the project. This may be as a result of increased presence of government activities in the area and a more efficient and well funded ADP.

Human Capital

The effect of the dredging project on the cost and availability of labour in the study area is shown in table 8.

Table 5: Human capital

Characteristics	Frequency	Percentage
Cost of labour		
Increased	48	80.00
Reduced	4	6.67
No effect	8	13.33
Total	60	100.00
availability of labour		
Increased	2	3.33
Reduced	51	85.00
No effect	7	11.67
Total	60	100.00

As shown in the table, 80% of the respondents claimed the project has lead to a substantial increase in the cost of labour and that they now find it very difficult to get labour to work on their farms as most of the young men and women who use to assist them now prefers menial jobs at the project site. On the average, the cost of labour before the project was about N400 per man-day. This has however increased to about N700 after the project. This has resulted in higher cost of production consequently higher cost of food items.



Conclusion

From the results of the study, it can be concluded that on the overall, the project has a positive impact on the socio economics of the arable farming households as well as on the economy in terms of increased economic activities on completion of the project, though not without some negative effects especially at its on-set. It is recommended that before embarking on such project in the future, proper and sufficient study and estimate should be done so that it can be executed according to approved specifications and within the defined time frame to prevent lengthy delay. Also, prompt and adequate compensation should be given to the Project Affected People who had their assets destroyed and their livelihood negatively affected as a result of the project. It is also recommended that public participation at the community level be given utmost importance in the assessment cycle as such will give room to a more comprehensive environmental impact assessment.



References

- Adato, M. and R. Meinzen-Dick. (2002). Assessing the impact of agricultural research on poverty using the sustainable livelihoods framework. Food Consumption and Nutrition Division Discussion Paper No. 128 and Environment and Production Technology Division Discussion Paper No. 89. International Food Policy Research Institute, Washington, DC, USA.
- Ade Sobande and Associates (1998): Dredging Impact Study. A report submitted to Shell Petroleum Development Company of Nigeria (SPDC), Warri.
- Ashley, C. and D. Carney. 1999. Sustainable livelihoods: lessons from early experience. Department for International Development (DFID), London, UK.
- Balgis Osman Elasha, Nagmeldin Goutbi Elhassan, Hanafi Ahmed, and Sumaya Zakieldin, (2005): Sustainable livelihood approach for assessing community resilience to climate change: case studies from Sudan, *An electronic publication of the AIACC project available from www.aiaccproject.org*. AIACC Working Paper No.17
- Barbara Nightingale and Charles A. Simenstad (2001): "Dredging Activities: Marine Issues", white paper submitted to Washington Department of Fish and Wildlife, Washington Department of Ecology and Washington Department of Transportation, University of Washington. Washington.
- Caney, D (ed). (1998): Sustainable Rural Livelihoods- what contribution can we make? DFID
- Caroline Ashley and Diana Carney (1999): Sustainable livelihoods: Lessons from early experience, Department for International Development
- Development
- DFID (Department for International Development). 1997. The UK White Paper on International Development – and Beyond. London, UK.
- DfID (1999) Sustainable Livelihoods Information Pack.
- Ian Scoones, (1998), 'Sustainable Rural Livelihoods: A Framework for Analysis', IDS Working Paper 72



- IFAD (2009): Enabling Poor Rural people to Overcome Poverty in Nigeria. Available at <http://www.ifad.org/operations/projects/regions/pa/factsheets/ng>
- Kerr, J. and S. Kolavalli. 1999. Impact of agricultural research on poverty alleviation: a conceptual framework with illustration from the literature. Environment and Production Technology Division Discussion Paper No. 56. International Food Policy Research Institute, Washington, DC, USA.
- Leadership (2012): River Niger Dredging: Issues, Ideas Keep Clashing. Reported by Nuhu Yarwa and Pembi Stephen. www.leadership.ng/nga/articles. Retrieved, 7th June, 2012
- Ohimain, E. I., T. O. T. Imoobe, and M O. Benka-Coker (2002): Impacts of dredging on zooplankton communities of Warri River, Niger Delta. *African Journal of Environmental Pollution and Health*. 1: 37 – 45
- People's Daily (2011): River Niger dredging cost jumps to N43bn. Reported by Mohammed Isa. Retrieved 15th May, 2012.
- PIANC (2005): Generic Biological Assessment Guidance for Dredging and Disposal, EnviCom Working Group 8. www.dredging.org/documents/ceda/downloads/publications-dredging_the_facts
- Salu, Abimbola. "The EIA Law and the Niger River Dredging Controversy," *Naturewatch*, January 2000, pp. 18-19.
- Van Dessel, J. P. and P. S Omoku (1994): Environmental impact of exploration and production operations on the Niger Delta Mangrove. *Proceedings of the second International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production*, Jakarta, pp. 437-445.
- Welcomme R.L. (1985): River fisheries. *FAO Fisheries Technical Paper*, No. 262, pp 330



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