

### Alleviating the Impact of Sand Dredging on Fishing

By: Fatai Abiola Sowunmi

#### EXECUTIVE SUMMARY



*A dredger in action at Epe, Lagos State*

Environmental degradation continues to pose a threat to the sustainability of African natural resource endowments. Increasing demand for sand for construction purposes has made sand dredging along river or sea resources a major threat to aquatic habitats and artisanal fishing. The importance of artisanal fishing as a source of protein, and means of livelihoods in Nigeria cannot be over emphasised, bearing in mind the high level of unemployment in the country.

This study examined the concept of environmental efficiency and how it can be used to evaluate the performance of artisanal fishing, using high water turbidity arising from sand dredging activities as a detrimental input. It also identified the cost and returns associated with artisanal fishing in sand dredging and non-sand dredging areas in Lagos State, Nigeria. The study highlighted the need for sand

dredging activities to be monitored and urged relevant authorities to consider restricting the activities of sand dredgers to non-fishing communities. It also recommended intensive family planning campaigns in fishing communities to reduce household sizes, and called for the need for fishermen to engage in fish farming to complement their income.



*Small-size fish caught at Majidun, Nigeria*

## INTRODUCTION

Fishery is an important agricultural sub-sector in Nigeria. There are more than 6 million coastal and riverine artisanal fisher folks. According to Bada (2005), artisanal fishing accounted for more than 80 per cent of total fish production in Nigeria and about 75 per cent of households' animal protein intake comes from artisanal fishing.

Lagos State is one of Nigeria's states with coastal sea and inland water dotted with many fishing communities. Besides over-exploitation of fishery resources, high demand for sand for construction purposes has made river sand dredging a big threat not only to the sustainability of artisanal fishing but also to the aquatic environment. River sand dredging continues to spread in many fishing communities in Nigeria. This situation, which is impacting negatively on fish production, may pose challenges to food security and employment opportunities in the fishing communities.

Dredge et al. (2009) posited that Lagos may be a place with the highest sand need in Nigeria, if not in Africa. This is because of the development of the World Bank-financed Lagos Mega City project, the Eko Atlantic City, the proposed Eko Energy City and numerous residential and industrial estates, new roads, airports and seaports cropping up at the vast Lekki peninsula in Badagry and practically many other development projects in different parts of the Lagos metropolis. As a result, constructors are constantly in search of sand, putting a lot of pressure on fishing sites.

Among the immediate effects of sand dredging, is the release of large quantities of solid substances into water bodies. These solids affect biological resources in various ways. The effects include physical harm to fish, interference with the purification process of the water body, and subsequently photosynthesis reactions. According to Balogun (2011), river sand, though vital for human use, mining activities have presented multifaceted problems.

## CONTEXT

While there are studies on artisanal fishing (production and technical efficiency) as well as the effect of sand dredging on artisanal fishing in Nigeria, none of these studies incorporated environmental factors. This makes it difficult for relevant stakeholders to adequately identify, prioritise and measure the environmental impact of sand dredging.

Bearing in mind the many Nigerians earning their livings from fishing, the findings of this study aim to offer a workable solution to environmental threat associated with sand dredging and the over-exploitation of marine resources. The findings will also inform authorities on the reasons behind many fishermen abandoning fishing for towns and cities in search of unavailable jobs.

## KEY FINDINGS

### *Household Size*

The results of the research reveal that the average household size of the respondents is 7.9 while the value is higher (8.6) among respondents in non-dredging areas, compared with the value of 7.2 in sand dredging areas. The average household sizes in the two locations are more than the national average household size of 5.2 and the average household size of Lagos state (3.8) (National Bureau of Statistics, 2012). This confirms high population among the fishing communities in the study areas, a situation that is leading to over-exploitation of fish stocks to meet households' daily food need.

### *Environmental Efficiency*

The study found that distribution of Environmental Efficiency (EE) score shows that about 65.1% of fishermen in the sand dredging area have EE score ranging from 0.001 to 0.099 while only 0.6% of the fishermen in non-dredging area are in this category (Figure 1 below). Generally, the result shows a very low EE scores among fishermen in the dredging area.

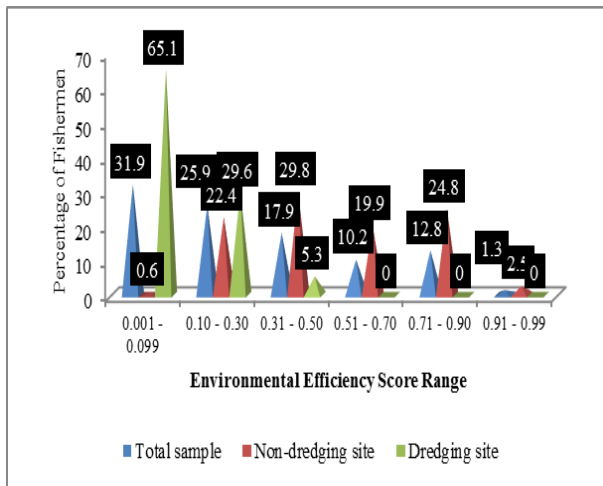


Figure 1: Distribution of Environmental Efficiency among Fishermen

### Costs and Returns of Fishermen

The findings also indicated that fishermen in the dredging area incurred higher cost per day.

This may be attributed to cost incurred on long distance travels to catch fish in order to avoid the dredging area. Generally, average total cost per day for fishermen in the sand dredging area is higher than that of non-dredging area.

Similarly, the average gross profit per day is higher among the fishermen in the non-dredging area (Table 1). However, the average per capita gross profit is higher among fishermen in the dredging area. While over-exploitation and large household size may be the reasons for the low per capita gross profit among fishing households in the non-dredging area, in the case of the dredging area, over-exploitation and dredging activities could be the reasons for the low average gross profit per day.

Table 1: Breakdown of costs and return of fishermen

Items	Average amount (₦)		
	Total Sample Site (313)	Non-dredging site (161)	Dredging site (152)
<b>Fixed cost per day</b>			
Canoe	152.34	156.46	148.22
Paddle	5.21	5.52	4.84
Net	81.48	90.32	72.02
Basket	4.57	4.21	4.85
Trap	5.68	7.26	4.1
Rope	6.68	6.93	6.58
Miscellaneous (knife, plastic bowl/bucket etc)	19.11	11.2	16.99
Cost of distance covered (km)	65.96	23.28	110.58
<b>Average total fixed cost</b>	<b>341.03</b>	<b>305.18</b>	<b>368.18</b>
<b>Variable cost</b>			
Bait	122.24	123.24	122.81
<b>Average total cost per day</b>	<b>377.44</b>	<b>405.14</b>	<b>350.41</b>
<b>Average revenue per day from fish</b>	<b>4,309.94</b>	<b>3,952.88</b>	<b>4,695.08</b>
<b>Revenue accruable for extra hours (other economic activities)</b>	<b>660</b>	<b>1290.00</b>	<b>-</b>
<b>Average gross profit per day</b>	<b>4,628.91</b>	<b>4,937.70</b>	<b>4,326.90</b>
<b>Average Household size</b>	<b>7.9</b>	<b>8.6</b>	<b>7.2</b>
<b>Average per capita gross profit</b>	<b>585.94</b>	<b>574.15</b>	<b>600.96</b>

## POLICY CONSIDERATIONS

The following suggestions are made to help mitigate the impact of sand dredging on fishing:

### *Restriction of Dredging License to Non-Fishing Communities*

The activities of dredging firms should be properly monitored by relevant authorities, by ensuring that dredging license is restricted to non-fishing communities.

### *Intensive Family Planning Campaign in Fishing Areas*

The family planning unit of the Ministry of Health in Lagos State should ensure that their family planning campaigns in the fishing communities are intensified. This will not only help to reduce household sizes but also reduce over-exploitation of aquatic stocks.

### *Fish Farming*

Fishermen need to be encouraged to rear fish or engage in other environmentally suitable agricultural ventures, for instance, swamp rice farming. This will go a long way to address over-exploitation and also help to improve their income.

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