THE EFFECTS OF SAND HARVESTING ON ECONOMIC GROWTH IN KENYA WITH CASE STUDY OF MACHAKOS COUNTY

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ABSTRACT

Sand mining is the removal of sand from their natural configuration. Sand is used for all kinds of projects like land reclamations, the construction of artificial islands and coastline stabilization. These projects have economic and social benefits, but sand mining can also have environmental problems. Environmental problems occur when the rate of extraction of sand, gravel and other materials exceeds the rate at which natural processes generate these materials. The morphologies of the mining areas have demonstrated the impact of harvesting with the prowess to destroy the cycle of ecosystems. In the past few decades, the demand for construction grade sand is increasing in many parts of the world due to rapid economic development and subsequent growth of building activities.Sand harvesting has been one of the serious environmental problems around the globe in recent years. In order to address these problems, pragmatic and explicit laws and regulations have to be developed by countries in a participatory manner so as to facilitate enforcement and compliance at all levels within the social settings. Mining of natural aggregates, including both sand and gravel and crushed rock, represents the main source of construction aggregates used throughout the world, with examples from Australia (Erskine & Green, 2009). However, operations of mining, whether small or large scale, are inherently disruptive to the environment (Makweba & Ndonde, 2010).

Key Words: *sand harvesting, economic growth, Machakos County*

Introduction

Sand harvesting is of great economy importance to Kenyan. It should however, be recognized that the processes involved in prospecting, extracting, refining and transporting involves a variety of stake holders from the point of harvesting through transportation to the middle men and finally to the users(Macharia, 2004). Harvesting of sand and gravel on agricultural land is one of the alternative livelihood activities of the rural people and is now become a source of livelihood for many rural communities in Machakos county.

Sand harvesting is widespread, highly unregulated, uncontrolled and is being carried out at an alarming rate. The gravity of the situation beyond the affected communities and the region at large is enormous and possess a threat not only to the environment but also to food security. Chiefs and land owners gave out land for monetary gains and caring less about the effects of the harvesting activities on the people and the environment (Imoru, 2010). Although sand harvesting contributes to the construction of buildings and development, its negative effects include the permanent loss of sand in areas, as well as major habitat destruction. Sand harvesting is regulated by law in many places, but is still often done illegally.

The mining activities engaged in the extraction of minerals used for building and construction purposes have been responsible for more extensive environmental impacts (Corey Navjot, Kelvin & Barry, 2007). Although individually, these operations are almost always small, pits and quarries are commonly left abandoned, particularly in regions where environmental control is deficient (Corey et al., 2007). In addition to the obvious visual impacts, these unreclaimed, excavated areas have contributed to the siltation of watercourses (Foody, 2001). Explosives are commonly used at quarries, thus generating high levels of noise and vibration and, in some cases, causing the release of rock fragments outside of mining areas. Mining in rivers cuts banks, thus altering the shape of riverbeds (Olang&Fürst 2011).

Statement of the Problem

Former government spokesman Alfred Mutua yesterday said he will enact a policy on sand harvesting if elected Machakos governor. Mutua said sand transporters are making a fortune in Nairobi while those scooping and loading it into Lorries are wallowing in poverty. "Sand scoopers are paid Sh200 each for loading a lorry which fetches Sh30, 000 in the city," Mutua said. He said he will initiate the creation of industries to pack the sand which will then be sold in hardware stores like cement. This, he said, will ensure a controlled harvesting of sand and prevent the roads leading to the rivers from being damaged by the Lorries. Mutua was speaking to local leaders in Mwala, a major sand producing district. (Wambua Kavila April 2013, *The Star p. 1*). While so many tonnes comes from machakos per day/month, economic impact of sand harvesting has not been documented and that is why the local leadership keeps banning sand harvesting.

While it is true that the sand users may be seen to be the main beneficiaries, the study seeks to show that the process greatly impacts positively on the lives of the communities involved in harvesting of sand in Machakos County. The study seeks to establish why sand harvesters are economically impoverished while contractors and transporters are getting richer. The outcome will inform the local leaders' arrears of improvement on policies and regulations, best harvesting technologies to be used to improve the demand and result in job creation and increased economic growth in the county. Locally, there has been no much empirical literature on impact of sand harvesting on economic growth. It is against this background that the study seeks to fill the

existing knowledge gap by investigating the effect of sand harvesting on economic growth in Kenya.

General Objective of the Study

The general objective of this study is to assessthe effect of sand harvesting on economic growth in Kenya.

Specific Objectives

1. To determine the effect of sand harvesting policies and regulations on economic growth in Machakos.
2. To assess the effect of sand harvesting technologyon economic growth in Machakos.
3. To examine the effect of demand on sand on economic growth in Machakos.
4. To establish the effect of job creation by sand harvesting on economic growth in Machakos.

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Literature Review

A study by the Times of India (2012) found that Sand Mining in India is adversely affecting the rivers, sea, forests & environment. Illegal mining of Sand and the lack of governance, in a big way is causing land degradation and threatened its rivers with extinction. Mining of sand, for instance, is depleting the waters of the rivers. Weak governance and rampant corruption are facilitating uncontrolled and illegal mining of sand and gravel in the rivers, threatening their very existence. This unrestrained and unregulated activity is posing threats of widespread depletion of water resources which may lead to avoidable food shortages and hardships for the people. Despite numerous prohibitions and regulations, sand mining continues rapidly on the riverbed of the Bharathapuzha.

Conceptual Framework

The conceptual framework of the study examined causal relationships between dependent and independent variables shown below:

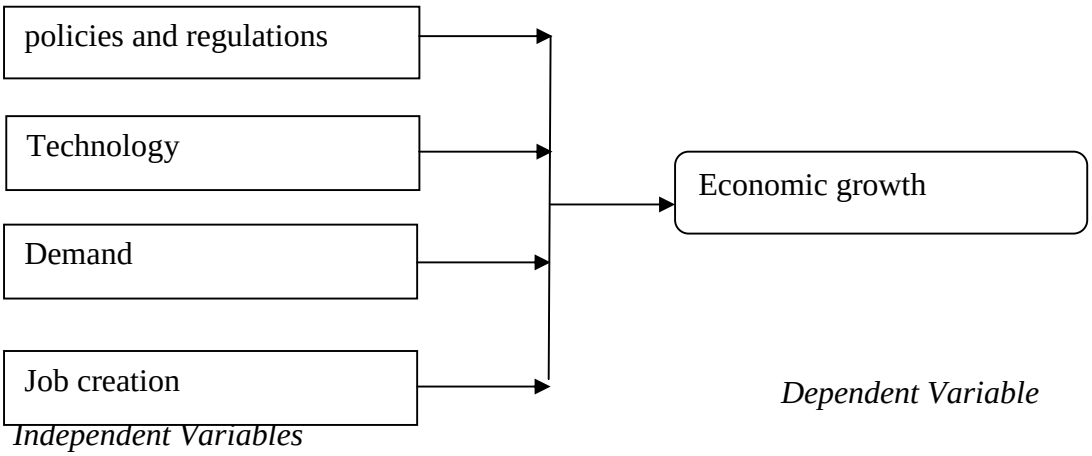

Figure 2.1: Conceptual Framework

Review of Variables

Policies and regulations

Musah (2009) carried in the Northern Region of Ghana and the East Gonja District (EGD) found that Sand and gravel mining has been one of the serious environmental problems around the globe in recent years. This often results in land degradation, loss of agricultural lands and biodiversity as well increased poverty among people. In order to address these problems, pragmatic and explicit laws and regulations have to be developed by countries in a participatory manner so as to facilitate enforcement and compliance at all levels within the social settings. The study revealed that policies and regulations on mining vis-à-vis monitoring and enforcement activities are quite explicit in the Gunnarsholt area compared to EGD.

Technology

The mining literature that focuses on developing countries, often in the context of the "resource curse thesis", offers several reasons why many poorer nations aggressively pursue mining as an economic growth strategy. Developing countries tend to view natural resources through classical theoretical perspectives, specifically, striving to achieve their comparative advantage as outlined in international trade theory (Bridge 2008).

Demand

With global demand exploding and such sources being mined faster than nature can replenish, it creates a highly skewed supply demand situation. The global value of construction is expected to reach 12 trillion USD per annum in 2020 or about 13 per cent of global GDP (Global Construction Perspectives, 2013). By and large, this industry is the lynchpin of economic growth and is popularly considered a primary engine of growth and an important indicator of development. After China and the United States, India has the world's largest construction business which accounts for 9 percent of its 2trillion USD economy.

Job Creation

A study by Deller and Schreiber (2012) on Frac Sand Mining and Community Economic Development found that communities that are more heavily dependent on mining for employment tend to experience greater negative impacts after the mines close than positive impacts while the mines are in operation. It was clear that making blanket generalizations about the impact of mining on the local community must be avoided. The study also revealed that in many ways sand mining can provide well-paying jobs leading to lower levels of poverty. But on the other hand, sand mining activity appears to be associated with poorer overall health levels within the community. The study concluded that for remote rural counties there is weak evidence that counties more heavily dependent on mining for employment will tend to have a slower population growth rate and that there is more consistent evidence that mining has a positive impact on employment and income growth rates (Deller& Schreiber, 2012).

Methodology

Research Design

Research design refers to the method used to carry out a research. This research srtudy will be studied through the use of a descriptive research design. According to Cooper and Schindler (2003), a descriptive study is concerned with finding out the what, where and how of a phenomenon. Descriptive research design was chosen because it enables the researcher to generalise the findings to a larger population. The main focus of this study is quantitative. However some qualitative approach will be used in order to gain a better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study.

Study Population

Target population in statistics is the specific population about which information is desired. According to Ngechu (2004), a population is a well-defined or set of elements, events, group of things that are being investigated. This definition ensures that population of interest is homogeneous. The target population of this study will be sand harvesters in Machakos county, Sand transporters, Building contractors and estate developers. The study intends to examine a target population of 120. Mugenda and Mugenda (2003), explain that the target population should have some observable characteristics, to which the researcher intends to generalize the results of the study.

Data Collection instruments

This study will collect quantitative data using a self-administered questionnaire. The researcher will drop the questionnaires physically at the respondents' place of work. Where it might prove difficult for the respondents to complete the questionnaire immediately, the researcher will leave the questionnaires with the respondents and picked them up later. The structured questions will be used in an effort to conserve time and money as well as to facilitate in easier analysis as they were in immediate usable form; while the unstructured questions will be used so as to encourage the respondent to give an in-depth and felt response without feeling held back in revealing any information. Each questionnaire will be coded and only the researcher will know which person responded. The coding technique will only be used for the purpose of matching returned, completed questionnaires with those delivered to the respondents.

Data Collection Procedure

The study will collect both primary and secondary data for the purpose of analyzing the effect of sand harvesting on economic growth. Primary data will be collected using a questionnaire while secondary data will be obtained from e-resources, previously published journals, magazines and other written material.

Data Analysis

Before processing the responses, the completed questionnaires will be edited for completeness and consistency. The data will then be coded to enable the responses to be grouped into various categories. Data collected that is purely quantitative will be analyzed by descriptive analysis. The descriptive statistical tools such as SPSS and MS Excel will help the researcher to describe the data and determine the extent used. The findings will be presented using tables and charts. Data analysis will use SPSS version 20 and Microsoft Excel, percentages, tabulations, means and other central tendencies. Tables will be used to summarize responses for further analysis and facilitate comparison.

Piloting

The researcher will select a pilot group of 10 individuals from the sample size to test the reliability of the research instrument. The pilot study will allow for pre-testing of the questionnaire. The clarity of the questionnaire to the respondents is necessary so as to enhance its validity and reliability. The aim is to correct inconsistencies arising from the questions, which will ensure that the questionnaire will measure what it is intended. The pilot data will not be included in the results of the actual study.

Data Validity and Reliability

The researcher will carry out a pilot study to pretest the validity and reliability of data collected using the questionnaire. According to Berg and Gall (1989) validity is the degree by which the sample of test items represents the content the test is designed to measure. Content validity will be employed in this study as a measure of the degree to which data collected represents a specific domain or content of a particular concept. Mugenda and Mugenda (1999) contend that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field. Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures.

Conclusions

The government, through various stakeholders can facilitate development of operational policies and regulations**.** Findings of this study are expected to be of great importance to various researchers in the current phenomenon. The documented report of this study will be easily acquired from the library and it will equip the learners with more knowledge and skills on the prevailing phenomenon. The study will further make a myriad of contributions to the literature on the effect of sand harvesting on economic growth which will be part of articles useful to researchers who want to further this study and to other wider stakeholders in academic circles.

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