TECHNO-ECONOMIC ASSESSMENT OF LIME PRODUCTION AND USAGE IN GHANAIAN INDUSTRIES

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ABSTRACT

Lime production is a lucrative business that Ghana Government can capitalize on to boost the current ailing economy. There exist a vast land that is lying idle with all the rich oysters and lime stones that can redeem the country from the vicious cycle of poverty. The higher fuel prices, emission-taxes and low efficiency of kilns forces the producers to focus on new ways of lime production. Now, a lot of research work has been done as the government is conservative the development of new solutions is slowly progressing. Well, the whole lime production cycle is very large area so therefore the main focus in this research will rely on purpose it serves in the petrochemical industry in Ghana. The objectives are to: identify the types of lime source (limestone and oyster shells); identify the usage of lime in Ghana's petroleum and establish the economic survey on the production and consumption of lime in Ghanaian industries. Both literature review and laboratory methods will be used in this study. Hence there is the need for an up to date technical analysis on lime production and its potential uses in a developing country like Ghana that both local and foreign investors could rely on.

Keywords: Techno, Economic, Assessment, Lime, Production

INTRODUCTION

Lime of this day is one of the largest chemical industries in the world. Every year about 408,000 tonnes of quicklime (calcium oxide) is produced. The lime is very versatile where as areas of usage have been defined (Miller, 1994). It is being produced in large Kilns or from hammer crushers which often have poor efficiency from the kiln process (Boynton, 1980). The kiln uses fossil fuel and is one of the largest constitutions of green house gases (GHG) such as carbon dioxide, Nitrogen Oxide (NO\textsubscript{3}), Magnesium Carbonate (MgCO\textsubscript{3}), among others (Flament and Schlegel, 2006).
The burner in the conventional lime kiln does affect the lime product. In this case, the flame of the burner is in direct contact with the limestone or oyster shells which the end product is polluted (Gutschick, 1994). In fact, it reduces the selling price of the lime which is already low quality from the start and again it reduces or decreases the areas of use of quicklime. Because quicklime is fairly cheap chemical product, the selling can start from $100-$140/ton. Many producers are trying to service it in terms of price. Now, exporting of the lime product is not economically feasible. In this case, a lime plant should be build to supply the local companies in Ghana.

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Quicklime is financially produced by dissociation of calcium carbonate (CaCO₃) to Calcium oxide (CaO) and carbon dioxide (CO₂). This process takes place in the kiln furnace at very high temperature of about 900°C - 1300°C depending on its requested properties. Other companies need modification of its heating techniques. In Ghana only CAMEUSE Company produces lime on a small scale which is constantly looking for new market areas where their product may fit unto the marketing trends. The lime industry is a viable business that Ghana government should try to join to make a difference in the business (Meier et al., 2005). The new ground for Cameuse Company of Takoradi is hoping that their products will serve Africa and part of Europe.

Scope of Study

This dissertation focuses on assessment of the available lime deposits in Ghana and its associate positive economic impact on the country with retrospect to boosting and strengthening the operations of petroleum industries. Emphases shall be placed on the assessment of the economic viabilities of locally produced lime and its usage in the Jubilee Oil Field, Takoradi.

Justification

Lime production is a lucrative business that Ghana Government can capitalize on to boost the current ailing economy. There exist a vast land that is lying idle with all the rich oysters and lime stones that can redeem the country from the vicious cycle of poverty. However, the fact remains that investors are not aware of the prospects of this precious natural resources. The quantum of lime that is utilized by petroleum companies and cement industries alone is just enough to stabilize the country's economy.
However, huge investment of this nature requires technological and economic assessment by engineers and economists who appreciate the technological and economic fundamentals of such a broad production industry. Hence there is the need for an up to date technical analysis on lime production and its potential uses in a developing country like Ghana that both local and foreign investors could rely on.

Aim

The aim of this proposal is to access the economic viability of lime usage in Ghanaian industries.

Objectives

The objectives are to:

- To identify the types of lime source (limestone and oyster shells).
- To identify the usage of lime in Ghana’s petroleum.
- To establish the economic survey on the production and consumption of lime in Ghanaian industries.

RESEARCH METHODOLOGY

The study will be undertaken to include the examination and analysis of the following:

1. Identification of the various minerals (limestone, oyster shells and dolomite) and their deposit sites in Ghana. These minerals exist in the Earth crust as sedimentary rocks.
2. Review literature on the uses and benefits of the various minerals present.
3. Conduct quantitative survey on the various types of minerals
4. Perform qualitative analysis on samples of the various types of minerals to confirm its quality and its possible uses in the Ghanaian petroleum industries.
5. Perform cost benefit analysis on production and consumption on the various minerals in the Ghanaian industries.
6. Perform demand and supply analysis of the lime in the Ghanaian industry.
7. Evaluate risk and opportunities in the lime business in Ghana.

FACILITIES AVAILABLE

- Carmeuse Lime company, Takoradi
- Lime company, Tenia
- Petroleum industries
- Geological survey department, Accra
- Environmental protection Agency, Accra
- Ghana Water company Limited
- Ghana Cement Factory, Tema
- Mining Companies in Ghana; Anglo -gold, Gold Fields, etc.
- Ministry of Agriculture
- Ghana Highway authority.
- Paint Industry
Research Hypotheses

- First Hypothesis Null Hypothesis (H₀)

Indigenous production and usage of limes in Ghanaian industries would have significant contribution to the sustainability of the Ghanaian economy. Alternative Hypothesis (H₁)

Indigenous production and usage of limes in Ghanaian industries would have no influence on the sustainability of the Ghanaian economy.

- Second Hypothesis Null Hypothesis (H₀)

The quality of lime composition in lime stones and oyster shells available in Ghana befit the international market standard. Alternative Hypothesis (H₁)

The quality of lime composition in lime stones and oyster shells available in Ghana does not much the international market standard.

REFERENCES


