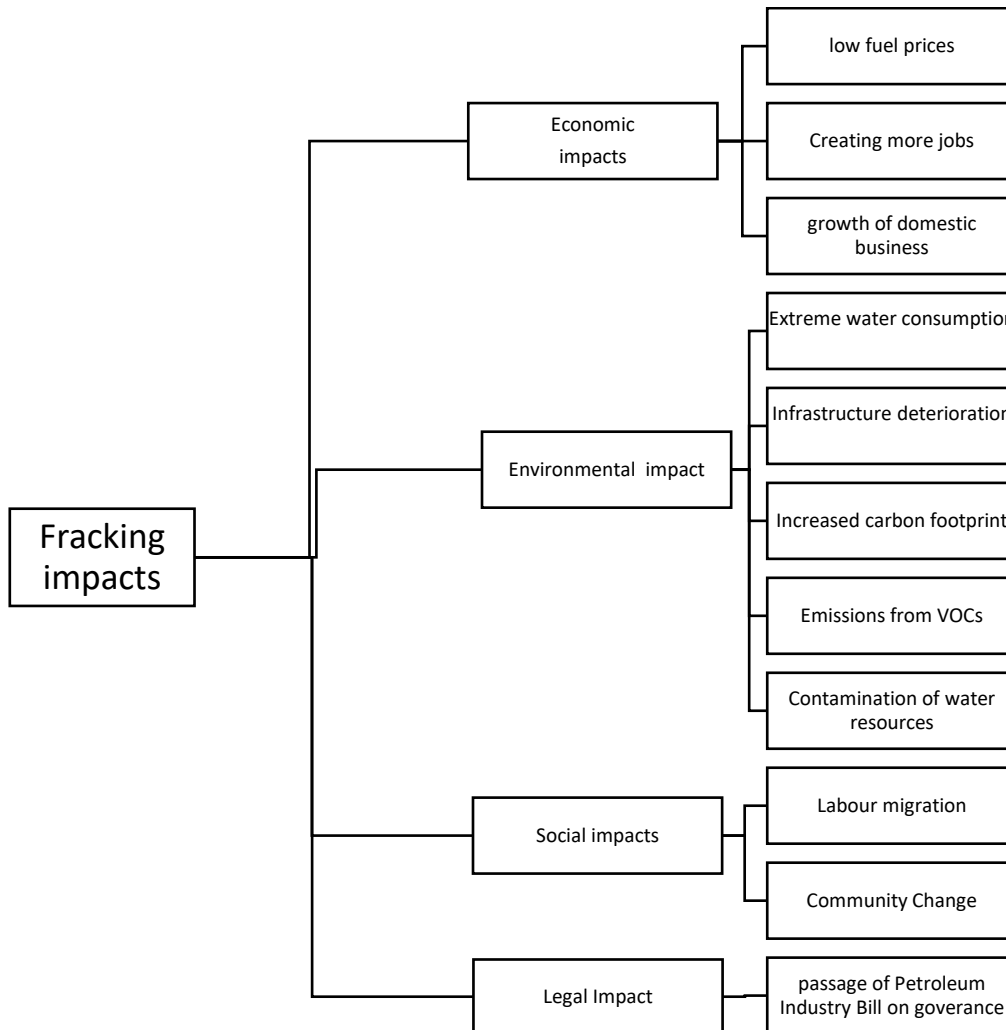


A LITERATURE SURVEY ON THE POTENTIAL IMPACTS OF FRACKING ON NIGERIA ECONOMIC, SOCIAL, LEGAL AND ENVIRONMENTAL SUSTAINABILITY

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GRAPHICAL ABSTRACT



Abstract

This study presents an intensive survey of literature focused on the different aspects of fracking potential impacts as related to Nigeria economy, social and environmental sustainability and establishes an understanding of the potential benefits and impacts of fracking on diverse spectrum of sustainability. The development of more innovative ways to limit the environmental damages of the fracking process should be on the priority list of the construction and engineering community's research agendas. Finally, an international assessment of fracking would be very useful in addressing the opportunities and threats of the fracking process.

Keywords: *Fracking; Economic; Environmental; Legal; Social; Nigeria*

Introduction

With a maximum crude oil production capacity of 2.5 million barrels per day, Nigeria ranks as Africa's largest producer of oil and the sixth largest oil producing country in the world. But, import virtually all its refined crude oil /energy due to bad state of its refineries. This current situation is regarded as a national security problem, which the current government is currently seeking ways to address this energy crisis by evaluating the cost and benefits of fracking activities as a means of resolving this problem.

Approaches to energy independence are based in three major channels. First, is increasing production from renewable energy sources such as wind, hydro and solar. Second, is the reduction of the Nigeria energy consumption. Third, is tapping more non-renewable resources such as the discovery of shale gas in Anambra Borno, Benue and in some North-Eastern parts of Nigeria. There are also shale gas deposits in other parts of southern Nigeria. The last alternative is a natural step for the oil and gas sector to take to resolve the current energy crises.

Exploring more fossil resources, especially shale gas, has been more pronounced with the advent of fracking which used in limestone deposit in 1947. The word "fracking" is a term used to denote hydraulic fracturing, by which large volume of water combined with chemical and sand proppant is injected into tight formations with high pressure to fracture and facilitate recovery of unconventional reserves of oil and gas (Meng 2017, Meng 2018),

In conclusion, exploration of shale gas has come with several implications which have both benefits as well as costs which deserves a consideration. This paper explains the diverse potential impacts of fracking with respect to Nigeria economy, social effects and environmental sustainability.

Relevance of the study

As climate change challenges continue to linger, it is pertinent to reexamine the sustainable usage of the environment.

A research was carried out in the United States of America (USA) as regards environmental pollution due to fracking activities. One of their research findings confirmed that active gas extraction site (one or more gas well within 1km) maximum methane concentrations in water quality. This the authors confirm to dangerous and destructive to human consumption.

Research question

The research question of the study is to examine the potential effects of fracking activities in Nigeria based on its established economic benefits, social effects, as well as its attendant environmental cost. This study will conclude the government must reconcile the much-needed mining industry with sustainable development.

Rationale for study

The rationale for the study is to seek an answer to the ongoing debate as to assess the economic benefits versus the environmental cost of fracking activities in Nigeria. As economic benefits of fracking activities are well documented globally. What is not as advertised is the environmental cost implication to the immediate environment. This channel does only provide the opportunity to the environment in terms of natural resource degradation alone but it will also affect the health status of people residing these areas.

In conclusion, shale gas development shares many science policy questions with other possible energy alternatives and, as a result, provides a good case study into the different actors at play and associated challenges. I believe that locally, nationally, and globally, costs and benefits of new energy options need to be assessed quickly.

Structure of the paper

This study is divided into three chapters. Chapter two presents the Economic, Environmental, Social and Governance impacts of Fracking Chapter three presents the evaluation recommendation.

The potential Economic, Environmental, Social and Governance impacts of Fracking

This section highlights the potential economic, environmental, social and governance impacts of fracking in Nigeria.

(Mehany and Guggemos 2015) affirm that fracking process has both benefits and threats, therefore its feasibility is an outstanding topic of argument to examine its potential on the Nigeria economic, social and environmental sustainability. The following subsections of this paper present supporting empirical findings and discuss its potential economic, social, legal and environmental impacts of the fracking process.

Economic impacts

(Hassett and Mathur 2013) opines that fracking is said to possess the following economic benefits impacts

1. Creating new jobs for the local communities around the drilling sites(Weber 2012)
2. Generating tax revenues(Insight 2011)
3. Advance nations energy independence and expansion of the energy sector.
4. Expand domestic consumption of energy (Considine, Watson et al. 2011)
5. Increase exports of energy products

Environmental Impacts

1. The contamination of ground water is a major concern for those who live near drilling operations and rely on drinking water wells (Colborn, Kwiatkowski et al. 2011, Gregory, Vidic et al. 2011, Howarth, Ingraffea et al. 2011, Schmidt 2011).
2. The procedure usually cause harm to the public health and the environment including but not limited to contaminating water supplies and causing hazardous gas emission and seismic activity near wells(Kerr 2010)
3. The uncontrolled and unregulated fracking may often lead to unprecedented depletion of the natural resources

In the same vein, the physical environment in the form of soil and terrestrial habitants will be ultimately affected in the course of utilizing the method. The cumulation of these effects results in environmental degradation and depletion (Gornitz, Daniels et al. 1994, Howarth, Ingraffea et al. 2011).

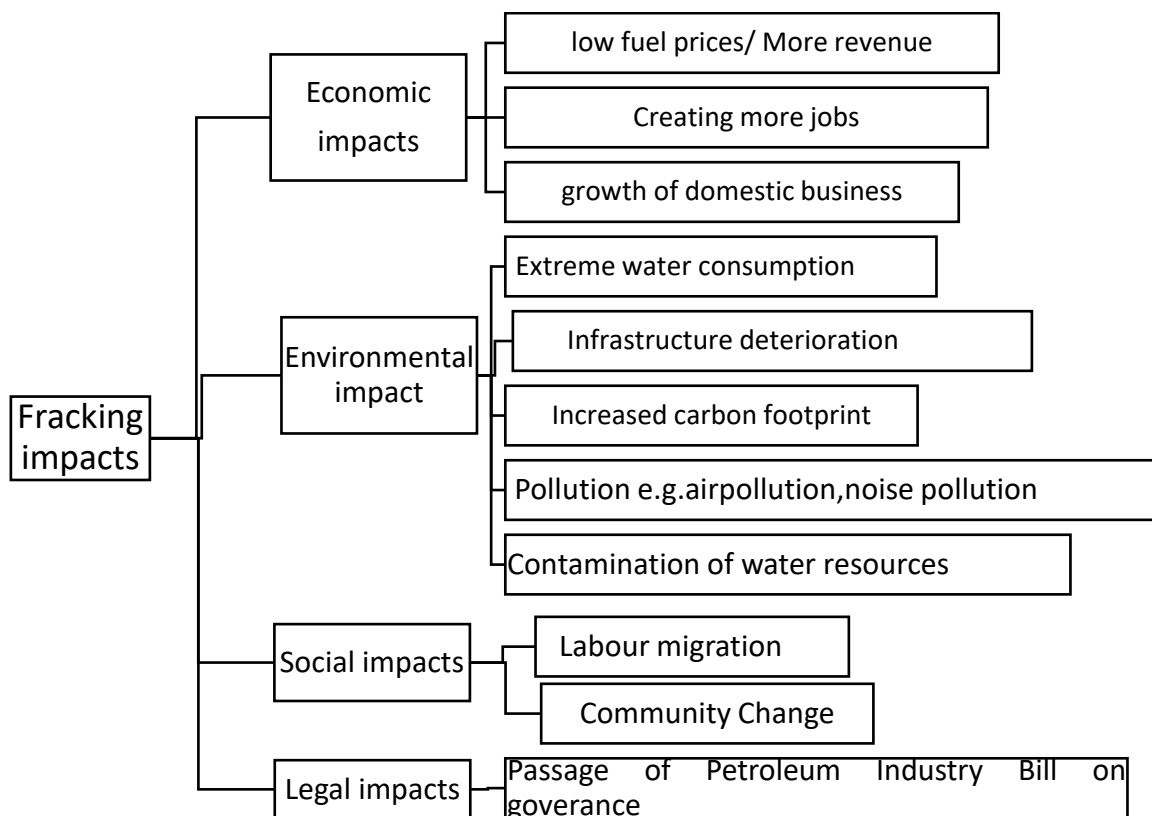


Fig. 1. A graphical representation of the potential Economic, Environmental, Social and Governance impacts of Fracking

Source: Authors (2021)

Social Impacts

Labour Migration

People working at fracking sites often move and aggregate into a nearby city or town, in which the communities are influenced and changed by these strangers who often move to other places as the drilling and fracking are completed and new fracking tasks are needed away from their current locations (Jacquet 2014).

Community Change

The landscape of so many communities in the United States of America (USA) has witnessed a drastic change as a result of the fracking activities in these areas. For example, deforestation caused by fracking (Drohan, Brittingham et al. 2012) or converting grassland into fracking pads has deep impact on the society such as loss of habitats for animal and plant species (Kiviat 2013), and could be an important factor stimulating climate change domestically and internationally.

Health risk

Potential human health risks from frack chemicals are difficult to characterize because sources, release mechanisms, transport, types of exposures, and toxicology of the potential chemicals involved are both complex and poorly understood. The routes by which health threats can enter the environment vary from legal to accidental to criminal

Legal Impacts

This section presents the legal impacts that was orchestrated by the potential shale exploration. As presented below:

Petroleum Industry Governance Bill

The Bill is the first in a series of long-awaited petroleum industry laws designed to reform the Nigerian oil and gas industry. The Petroleum Industry Bill (PIB), an omnibus law meant to regulate the entire sphere of the industry and repeal all current existing oil and gas legislation, had struggled to see the light of day despite its introduction to the National Assembly over 16 years ago. Subsequently, the National Assembly decided to break the PIB into a number of different pieces of legislation guiding specific aspects of the industry. The PIGB is the first of several Bills (the Petroleum Industry Fiscal Bill and the Host Community Bill are currently before the Senate) which the National Assembly will debate and pass in due course.

The Senate of the Federal Republic of Nigeria (FRN), on Thursday 25 May 2017, passed the Petroleum Industry Governance Bill (PIGB or the Bill). The Bill, which still needs to be passed by the House of Representatives and assented to by the President of the FRN before it becomes law, seeks to establish a framework for the creation of commercially-oriented and profit-driven petroleum entities, to ensure value addition and internationalization of the petroleum industry, through the creation of efficient and effective governing institutions with clear and separate roles for the petroleum industry.

Highlights of the Bill

The Bill establishes/confirms a number of new/existing institutions, which can be broadly classified into the following categories:

- i. Policy and general strategy formulator– Tasked with setting overall policy and direction for the industry
- ii. Regulator – Charged with regulating the entire industry
- iii. Commercial Institutions – Tasked with holding and managing the assets and interests of the Government
- iv. Ancillary Institutions – Tasked with the provision of specific support services assigned to them

In conclusion, the Bill is still work in progress as both Legislative Houses will need to harmonize their versions of the Bill before it is sent to the President for Assent. The President also has the right to request for clarity on sections of the Bill before assenting or refusing to assent if he is not satisfied with the clarification provided or the Bill as a whole. It is therefore essential that all stakeholders take advantage of this opportunity to seek clarity and where possible, propose changes to the Bill in order to ensure that what is signed into law accomplishes the main objective of reforming the industry for the collective good.

Evaluation Recommendation

Sustainable development will need to be inclusive and take special care of the needs of not only the poorest and most vulnerable people, but also the poorest and most vulnerable areas. Strategies need to be ambitious, action-oriented and collaborative, and to adapt to different levels of development. They will need to systemically change consumption and production patterns, and might entail, inter alia, significant price corrections; encourage the preservation of natural endowments; reduce inequality; and strengthen economic governance.

However, adopting a mere 'copy and paste' is also not the answer. Because contemporary fracking is a relatively new mining technique, South Africa is but one of many jurisdictions where this legislative issue exists of whether SA should adopt a separate fracking-specific legal framework. Even in the USA, which has the most fracking experience, there is a move to introduce fracking-specific legislation to areas that possess shale gas resources, with the exception of course of those areas where the technology has already been banned. For the South African government, a swift solution does not exist. Arguably, filling South Africa's legislative problem by simply adopting a foreign regulatory regime is not an appropriate solution. It is common cause that the potentially negative consequences of fracking vary depending on the specific features of the location in which fracking is proposed.

In conclusion, the local government authorities are recommended to take the following steps

1. It is proposed that local authorities should regulate the oil exploration process by applicable conditions to be complied with by International Oil Companies (IOCs).
2. Fines and penalties may be imposed on erring IOCs whose operations contravene the pre-conditions.
3. Fracking may be completely banned within the municipality of the local area.
4. Local government should set-up agencies like National Environmental Standard Regulation and Enforcement Agency (NESREA) and National

Oil Spill Detection and state can have agencies like environmental protection agency (LASEPA).

5. Amendment of environmental protection laws and jurisprudence be amended towards adopting the American model whereby local authorities make bye-laws and regulate oil exploration in practice in conjunction with the state and federal governments

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