International Journal of Advanced Studies in Business Strategies and Management
Hard Print: 2354-4236 Online: 2354-4244 Vol. 4, No. 2 July, 2016

Asset Management Strategies in the UK North Sea and Offshore Ghana: an Investor Perspective

[1]Suleiman, Moses Baidu & [2]Isa, Wednesday
[1&2]Department of Accountancy, Federal Polytechnic Mubi, Nigeria

Abstract

This report examined the feasibility and strategies of investing in UK North Sea and Offshore Ghana fields. This report aims to provide details substantial input into the final investment decision of a company. It explored and developed specific asset management strategies for company. It was observed that UK North Sea is a matured field requiring modern technology to operate in the field and that cost of production is high compared to other regions. However, the study also revealed that other factors such as social, fiscal, environmental and political are relatively controlled and stable. While the Ghana offshore field, a developing field faces the threat of undeveloped infrastructure and low cost of production. The asset management strategies recommended for UK North Sea field differ from the Ghana offshore field. In specific, for UK iipofield, the strategy should be technology based due to the prevailing features. For the Offshore Ghana field, the strategy will involve hiring of experts from NOC, firms and neighbouring countries like Nigeria to save cost. Also, the study noted that Ghana requires a robust stakeholder management strategy.

Keywords: *UK North Sea, Offshore Ghana, Asset management, Strategies, Stakeholders.*

Corresponding Author: Suleiman, Moses Baidu

Background to the Study

Investing in oil and gas exploration and production requires huge capital outlay (Wright and Gallun 2011). Any company seeking to invest in such venture need to plan the strategy to be adopted. It is imperative that an asset management strategy should be developed. A good asset management strategy gives a clearer picture about managing an asset (investment) and could save costs when implementing the plan. This report seeks to outline, explore and develop asset management strategies which will be used as input into the final investment decision of a petroleum company planning to invest in UK North Sea and Offshore Ghana. It discussed the background to the new fields, the asset team organisation strategies, stakeholders' management strategies, innovation and technology strategies, field life cycle management strategy and finally conclusion and recommendations.

Objective of the Study

The objective of this paper is to provide details substantial input into the final investment decision of a company.

Literature Review

Background to UK North Sea and Ghana Offshore

The UK North Sea is one of the oldest fields in the world. The field started production in 1967. Production in this region is declining due to the ageing of the basin (Garcia-Blanco et al. 2010). High technologies are deployed to enhance oil recovery and reduce costs of production in the field. Ghana Offshore field is a new field where production in commercial quantity started in 2010. The field has limited infrastructural development unlike the UK North Sea (Bawole 2013).

Furthermore, other factors are also studied to give clear understanding of the fields are:

1. **Social Consideration:** Social groups in UK field have a developed system and ways of addressing their grievances. Companies operating in the field implement corporate social responsibility (Macklin and de Koning 2004). However, in Ghana, community clashes and problems of land access to offshore activities are described as some of the issues common. Research showed that communities are not considered when projects are awarded and that local authorities give less attention to the land owners (Bawole 2013; Fred-Mensah 1999; Standing 2014).

2. **Fiscal Consideration**: UK practices the concessionary fiscal system. But Royalty fiscal system was first adopted then abolished it in 2001. The UK government gives incentives in form of allowances and special taxes to investors in order to encourage investment in the field and to cushion the effect of high production cost (Agha 2014). Ghana also practice Royalty/Tax regime established by Petroleum law of 1984 (Agha 2014; Bock and Rodriguez 2011). The law permits Ghana National Petroleum Corporation (GNPC) to enter into contracts with the International Oil Companies (IOC). Production cost in the region is relatively low. The system was friendly to investors than the concessionary regime (Agha, 2014).

3. **Technical Consideration**: The issue here is whether the fields have adequate technology for the operations. The UK field has high technologies to meet existing

challenges. For instance, the Enhanced Oil Recovery (EOR) technologies initiated in the North Sea improved the field's production capacity (Bock and Rodriguez 2011; Awan, Teigland and Kleppe 2006; McIntyre et al. 2009; Berge 2005). Conversely, technology in Ghana oil and gas industry was observed to be inadequate to meet the need of the field. In Ghana upstream activities, it was noted that the availability of technology was deficient (Rutherford and Ofori-Mensah 2011).

4. **Environmental Considerations:** Due to long term operation environmental issues are well regulated in the UK. For example, the OSPAR convention for the protection of the North East Atlantic, 1992 is the primary environmental regulations in use. This regulation seeks to prevent and eliminate pollution by implementing measures to safeguard against negative effects of human activities (Garland 2011). Ghana environment is regulated by the Ministry of Environment, Science and Technology (MEST). Study revealed that implementation of environmental legislation was weak (Slocum, Boakye-agyei, et al. 2012).One of the major weaknesses observed was lack of clarity in roles and responsibilities.

5. **Political Considerations:** Politics in UK is stable and has less interference with oil activities (Agha 2014). Politicians do not have control over the industry as in the case of some countries like Nigeria. However, in Ghana, political issues in the oil and gas sector have been under control. Substantive measures were put in place to prevent too much political interference (Rutherford and Ofori-Mensah 2011).

Asset Team Organisation Strategies

The organization of Asset management team is imperative in managing the assets of upstream petroleum industry. High technical demand of oil and gas activities necessitates a coherent organization of team of experts to effectively manage the process. Asset Team organization is based on type of assets, the objectives of the organization and phases of the asset's life cycle (Attaran and Nguyen 2000). Asset team members for petroleum assets are drawn from vast range of disciplines. The team's organizations, responsibilities and operations are discussed below.

1. **Asset Management Group:** Asset Management Group comprises nine members well experienced in oil and gas exploration and production activities drawn from the company or hired from other companies. The group is headed by a senior manager with high technical knowledge of the industry. Members include leaders of various asset teams; Geologist, petroleum engineer, reservoir engineer, drilling engineer, production & maintenance engineer, Decommissioning Engineer, Legal expert and financial analyst (Garcia-Blanco et al. 2010; Attaran and Nguyen 2000). The main responsibility of the team is to acquire, explore and develop oil and gas assets. The group also have the obligation to effectively maintain and decommission the assets at the end of the asset's life. This group relies on the inputs from the respective teams which will be used to form the overall asset management plan. The team in Ghana field should be organized using experts from national oil companies and independent firms in Ghana or Nigeria to reduce cost of hiring professionals.

2. **Acquisition Team:** This team has the role to make input and plan the acquisition of oil and gas mining licence. The project team comprises of a Geologist/Geophysicist as the leader. Members of the team include an experience lawyer, engineers and financial analyst (Sulaiman and Husin 2000).The team studies surface data, subsurface data, regulations and financial analysis then make input to the main asset management team. In order to maximise the use of the team of professionals hired, the team members here should be drawn from the asset management group.

3. **Exploration Team:** This team is headed by an experience Geologist/Geophysicist from the company. Members include engineers, economist and HS&E. This team conducts a detail study generating the data using technology such as 3D and 4D seismic. The team work with the various engineering and construction team (Sulaiman and Husin 2000; Satter and Thakur 1998).

4. **Appraisal Team:** This team evaluates the possibility of reserves in commercial quantity. It requires experts in modelling. The team conduct detail probabilistic and simulation models in establishing the quantity of hydrocarbons (Satter and Thakur 1998). The outcome here determines whether to invest or not. The team work with other engineering disciplines headed by an experienced subsurface engineer.

5. **Development Team:** The project team is headed by Drilling engineer. The team also includes reservoir engineers and petroleum engineers. This team has the responsibility of incurring the largest CAPEX, hence their input and knowledge for the existing prices and supply will be required (Asghari and Rakhshanikia 2013). They also work with the safety engineers and maintenance engineers.

6. **Operation and Maintenance Team:** This project team has the Maintenance/Process engineer as the head. Members include subsurface and surface engineers. It relates with the logistics team, HS&E team, Reservoir management team and the acquisition team. It is responsible for the operations and maintenance of the production (Sulaiman and Husin 2000; Lansing 2007). The main purpose is to reduce cost of operations and improve performance.

7. **Decommissioning Team:** This team is headed by a Decommissioning/Waste Demolition engineer. It includes both surface and subsurface engineers. The team makes contribution at the concept development stage and throughout the project life having a complete record of the constructions made on the asset field (Gallant and Blickle 2005; Lansing 2007). The project team work with safety engineers and regulatory agencies to ensure safe decommissioning.

Stakeholders Definition, Identification and Management

Stakeholders' interest in oil and gas exploration and production activities is key to the business success (Achterkamp and Vos 2008). Stakeholders refer to any individual or group who has the capacity to influence or be influenced either positively or negatively by the decisions of a company (Abuzeinab and Arif 2014; Martin 2006). Successful engagement

with stakeholders starts with proper identification of who they are and to what extent can they affect or be affected by the company's decisions. Therefore, upon identifying the stakeholders, an effective strategy can be employed to manage them in order to be successful.

i. **Stakeholders Identification:** Stakeholders' identification means discovering the real party who could or should do what stakeholders are expected to do. A model designed by Vos and Achterkamp (2008) can be used to identify stakeholders through brainstorming by a focus group. This model is similar to Environmental Impact Screening strategy used in Nigeria for a project of Non-associated West African Gas (Martin 2006). Stakeholders are invited to make contributions on who can influence or be influenced by the project and at what stage. This identification technique precedes the planning phase. Considering the proposed projects in the two regions, the same technique can be applied. However, management of the stakeholders will differ.

ii. **Stakeholders Management Strategies:** There are no two projects within the same region that can be managed using the same management strategies (Martin 2006). This is the reason why the strategy used in Australian North West Shelf cannot be applicable in either North Sea or Ghana Offshore. Therefore, strategies required for the regions are given below.

UK North Sea

Managing stakeholders here can be done using mathematical model such as the game theory (Martin 2006). This model determines the relationship between various interest groups identified. The model reveals the probable outcomes using different information as inputs. It helps the management and teams to interact with the different stakeholders effectively (Donaldson and Preston 1995). For example, this model was used in Lombardi Steam flood project in United States (Martin 2006).

Ghana Offshore

In Ghana field, stakeholders' management requires a direct engagement approach where identified stakeholders are invited for regular meetings and briefing (Bawole 2013; Ablo 2015). Again, implementation of local content provisions and other regulatory requirements helps foster good relationship with stakeholders. More so, internal stakeholders can be motivated by incentives, collaborations and empowerment through training. Stakeholders should be engaged at each phase of project lifecycle.

Technology and Innovation Management Strategies

Increasing challenges such as decline in production, emission of greenhouse gas, geological complexities, etc. have necessitated the demand for advanced technology and continuous innovations (Perrons 2014; Imomoh 2012; Parshall 2011). Improved technology results to cost-effective production and friendly community. However, it is argued that research and development into new technology and innovation are costly and takes long period for it to be tested and accepted in the industry (Perrons 2014; Perrons and Donnelly 2012). Despite the challenges, Shell developed the concept of horizontal drilling, deepwater drilling, etc to meet industry demand. Innovation should be a priority in the statement of objectives.

Managing innovations in the UK field requires a good working atmosphere. Individuals can be encouraged to be innovative and/or organise an R&D unit to conduct research on identified problem (Perrons 2014). In the UK innovations are high, while in Ghana, individuals can be motivated to observe problems and develop ideas to solve it with a reward for success.

Field lifecycle Management Strategies

Field life cycle management "refers to the management of asset over life cycle, from before acquisition to disposal, taking into account economic, environmental, social and technical factors and performances, and thus also stresses the importance of a multidisciplinary approach to asset management" (Ruitenburg, Braaksma and van Dongen 2014). Management of asset starts with concept development, through licensee acquisition, exploration, appraisal, development, production and abandonment (Sulaiman and Husin 2000). Managing oil field is necessary to minimize costs, reduce delay and maximize long term profitability.

UK field requires an integrated management approach where all teams share data through a network (Ruitenburg, Braaksma and van Dongen 2014). However, Ghana offshore life-cycle management requires a multidisciplinary approach. Integrated network approach may not be feasible due to insufficient infrastructure.

Acquisition Phase

Acquisition phase considers the preliminary data that the asset management team will use to make decision on applying for license to explore or not. In the UK, oil blocks data are available with the DECC this gives investors opportunity to access and study the mapping. Literatures suggested that such study should be handled by acquisition team, which includes experts from consulting firms in UK. The team can conduct an independent Geological and Geophysical (G&G) study of the field to ascertain the accuracy of data with the DECC and also investigate available technology, fiscal regime, environmental regulations, stakeholders engagements and social issues in the region (Denni-Fiberesima and Abdul 2011). The data collected becomes a valuable input into the bidding process.

In Ghana field, data for the fields are not sufficient due to its state of development, therefore, Garcia-Blanco, Chernacov and Laria (2010) suggested that investing operator deploys its multidiscipline asset team headed by a geologist including experts from the national oil company to conduct a study. The G&G and other related data collected will serve as input to bidding for the licensed. In Ghana field, Bawole (2013) suggested an early engagement with the stakeholders especially the local communities.

Exploration Phase

Exploration activities involve surface and subsurface study of the rock features. Seismology is the prominent technology used at this stage. In the UK field experience professionals with modern technology are required to conduct the study. A multidisciplinary team drawn from the company, consultancy firm and oil servicing companies undertakes a comprehensive study with all the relevant technologies such as the 4D and 3D seismic technology. The stakeholders to be engaged at this stage are the contractors, employees and government

regulatory agencies to ensure flow of communication and clarity of each role (Adeyemi, et al. 2008).

In the Ghana Field, getting technology and experience experts from UK field may be expensive. Therefore, a multidisciplinary team comprising experts from the company and the NOC should handle the exploration. Furthermore, there is need for meeting with the local community leaders, NOC and government regulatory agencies. Success depends on the extent of stakeholders' engagement and the project team (Adeyemi, et al. 2008).

Appraisal Phase

The main activity in this phase is to deploy further technology to ascertain the extent of reserve whether it is in commercial quantity (Wright and Gallun 2011). It is a critical stage as huge investment is involved, wide range of uncertainty and grave decision must be made. An integrated asset team is essential. This team is to use simulation models and probability measures to study the movement of the reservoir. The risk here involves decision making that may result to 'wildcat'. Therefore, caution of great detail is exercised (Costa and Schiozer 2003).

In the UK field, there are experts that can be drawn from other operators and service companies (Garcia-Blanco et al. 2010). It is imperative that some experts from the company are part of the team so that knowledge can be transferred to the company. In the case of the Ghana offshore, an asset team including the NOC and experts from service companies can be put together. The success of the business relies deeply on the data revealed by the team. Again, stakeholders' engagement is pertinent to the success of this stage.

Development Phase

If the result in the appraisal turns out positive, a decision to develop the reserves follows. This stage involves drilling well, platform building and pipeline installations. Literatures revealed that drilling activities are best handled by Drilling companies (Bommer and Baker 2008). However, when awarding the contract, adequate measures to reduce unnecessary cost has to be considered. Drilling, Reservoir and petroleum engineers are expected to work closely with the drilling contractors to guard against deviation from data collected.

The UK field has experienced drilling contractors that can be engaged to handle the work. Also, engaging stakeholders especially suppliers, vendors, contractors, regulatory agencies and employees are required. In Ghana, drilling contractors available in the region should be engaged to reduce cost. However, firms engaged should be such that has good past records on drilling and an expert from other firm could be hired to supervise the drilling.

Operations and Maintenance Phase

After the drilling and installation phase, operations and maintenance engineering team takes over. The main purpose of this phase is to ensure the smooth process of production with minimum operating costs (OPEX). This can be achieved by integrating functions and reduce number of employees handling the operations, time use in maintenance and delay in supply of logistics (Woodhouse 2007). In UK field where modern technologies are available, maintenance of petroleum assets can be automated. Studies showed that using technology

for scheduling maintenance and operations minimizes costs, reduces offshore workers' risks and improve performance. Furthermore, since the field is a matured field, the reservoir team should apply the Enhanced Oil Recovery (EOR) technology to improve production.

However, in Ghana field, modern technology can be deployed but the cost of installing and hiring specialist could be high. Another constraint might be the local content requirement of employing a percentage of workers into the work force of the company. Maintenance and operations uses more employees than any other phase. Hence to minimize cost, employees should be adequately engaged considering the local content law, health safety, risk and improve performance (Lansing 2007). Logistics and suppliers in the field require adequate monitoring to prevent breakdown in process.

Decommissioning Phase

This is the last stage in the asset lifecycle. The project team uses the decommissioning documents established during project development to dismantle the platform and plug the rig from the well. UK government has tax relief and allowances to companies on decommissioning to cushion the cost of demolition. The cost should have been provided for according to initial planning strategy (Gallant and Blickle 2005). Stakeholders especially regulatory agencies are to be adequately engaged. On the other hand, Ghana field do not have allowances for decommissioning. Stakeholders' engagement here should be robust.

Conclusion and Recommendations

This report explored factors associated with UK North Sea and Ghana Offshore fields, and presented strategies that is to be adopted by the company as input into investment plan of the prospective fields. The study revealed that UK North Sea is a matured field with a declining production and high costs of production. However, the report showed that Ghana offshore field is a developing field with limited infrastructures and low cost of production. The study recommends that the management should use the available technologies and expert to develop the UK field while the offshore Ghana field requires engagement with stakeholders and use firms of high quality.

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