Sustainable Decommissioning Plan and Corporate Social Responsibility in the Global South: A Case Study of a Matured Province (Bahrain Oil Field)

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Abstract

This paper discusses sustainable decommissioning plan and corporate social responsibility (CSR) for a matured province in the Global South (GS) using Bahrain field in Bahrain as a case study. Crude oil remains a strong source of revenue (80%) in Bahrain while the majority of the government budget is funded by the oil and gas industry]. Matured province is a field attaining its economic limit after primary and secondary recovery effort. It involves high cost of operations for a given output. This paper proposes a holistic view of the relationship and interconnection of system within the oil and gas industries. Decommissioning occurs when the operational cost of operating the oil and gas platform is greater than revenue. Bahrain oil field has tentatively reached its limit of 217 x10^6 boe/day. This amount to 88% of its total recoverable reserves in 2022 and hence the need for a viable decommissioning plans. Despite a high level of stakeholders' involvement in decommissioning, the level of disclosure was set to be very low. An innovative PESTLE is said to be essential in any decommissioning of a matured province. Considering the age of the Bahrain field and the use of different technologies to enhance the recovery of oil, the infrastructures might be dilapidated. There is no clear evidence of oil and gas decommissioning legislation in Bahrain, however, there are international laws guiding oil and gas operators. Bahrain is a mature field given the age of the oil fields, and production projected decline. This paper reinforces the need for every oil and gas company to carry the stakeholders along in their operation and ensure that their basic needs are provided in ethical manners and also improving the lives of the workforce, families and society at large which has been revealed to have significant relationship with organisational performance Future work in respect of decommissioning plan and CSR will include visitation to various sites in the Global South in an attempt to produce a viable and sustainable plan that addresses the specificity of various regions.

1. Introduction

This research aims to address the issue of decommissioning. It is paramount to have a decommissioning plan in place given the economic, social and environmental implications. Further, the role of Corporate Social Responsibility (CSR) strategy would need to be put in place to mitigate these impacts. Decommissioning occurs when the operational cost of operating the oil and gas platform is greater than revenue; it is commonly said that such assets have reached their economic life and it is no longer viable.

Bahrain oil field is in Jabal ad Dukhan – about 5 km to Awali the central of Bahrain; the Island is 80% of the total land area of the country [1]. Bahrain field total production in 2015 was 156 x 10^6 boe/d and in 2022 the peak production became 217 x 10^6 boe/d with a projection of reaching its economic limit in 2027 by producing 152 x 10^6 boe/d as shown in Figure 1 [2]. The field has recovered 87.94% of its total recoverable reserves and accounts for 0.76% of global reserves. Currently, 56% of the country's daily output comes from Bahrain field.

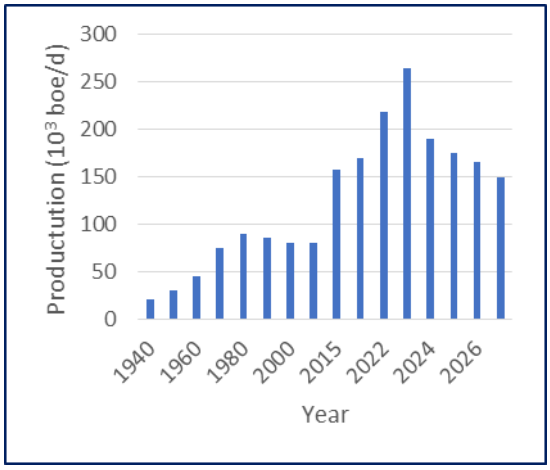

Figure 1. Global Oil and Gas Intelligence Center [2]

The Gross domestic Product crude oil in Bahrain from 1980 to 2021 is shown in Table 1 and the value for 2021 is 10.9% [3].

Table 1. Crude Oil Contribution to GDP

Year	Oil Rent (% of GDP)
1980	68.1
1985	30.4

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1990	37.0
1995	15.2
2000	18.7
2005	20.1
2010	17.3
2015	9.8
2020	6.7
2021	10.9

Crude oil remains a strong source of revenue as 80% of the government budget is funded by the oil and gas industry [4].

2. Literature Review

A mature province is characterised by a significant decline in production or have produced for over twenty-five (25) years [5]. Defines matured province as a field attaining its economic limit after primary and secondary recovery efforts [6]. High cost of operation in relation to low productivity rate is characterised by a matured field [7].

An examination and extent of compliance by oil and gas company taking a stakeholders' view during decommissioning was shown to be high whilst reporting a low disclosure [8]. Analysis of UK and US practices indicates incorporation of international best practices to decommissioning of both onshore and offshore platforms [9]. It has been argued that innovative political, economic, social, technical, legal and environmental (PESTLE) factors are to be considered in sustainable decommissioning [10]. Views decommissioning as the process of removing a facility out of service and restoring the seabed as closely as possible to its natural state. It is basically the reverse installation process from well closure to seabed cleaning [11].

Figure 2. Dimensions of Decommissioning Process

Holistic view of the relationship and interconnection of the dimensions as seen in
Figure **2** is a Framework of decommissioning process [12]. The use of specifications such as ISO 15926 and the Capital Facilities Information Handover Specification for process industries (CFIHOS) was proposed as a framework for the development of decommissioning programmes of Oil and Gas facilities [13]. Investigation of stakeholders' perceptions in relation to future of the platform and sustainable decommissioning reveals reuse as an opportunity to minimise the impacts on the environment, economic, and social perspective. Examination ways of improving efficiency and environmental benefits of decommissioning, recommend that UK government should review and have a conceptual framework combining strategic, evidence-based decommissioning options with proportionate regulatory practices because one-size-fits-all approach is not sustainable [14]; Issues relating to environment, development and governance can be addressed using an established concept of CSR [15]. It has been reported that the leading global industry will be those that provide goods and services that meet the customers' needs in a way that addresses the world's challenges such as poverty alleviation and climate change [16]. Comprehensive incorporation of CSR in core business process is particularly important for achieving effective business outcomes [17]. Examination of impact of CSR on the reputation of Oil and Gas Company was conducted and reveals that ethics and philanthropic practices have significant relationship with organisational performance [18].

It has also been established in literature that incorporation of effective CSR in Oil and Gas companies help in the reduction of employees' whilst increasing the organisation turnover [19]. CSR has moved from profit generation to include a set of tasks with a notion that the main responsibility of companies should be shared value [20]. It has been argued that an integrated framework for implementing CSR would need to be multi-dimensional and of different level in nature [21]. Investigates on environmental justice and returns on assets of the oil and gas companies and reveals that environmental justice had a statistically positive significant effect on return on assets [22]

3. Discussions and Findings

Onshore decommissioning involves the removal of all surface equipment, production tubing, and uncemented casing from a well. To achieve effective sealing of the well, certain wellbore segments are injected with concrete material to create separation between reservoir fluids and guarantee their confinement within the reservoir, preventing them from migrating to the surface. Offshore structure is made up of two components namely; topside or platform and substructure plunged beneath the water's surface and others situated on the seabed also known as mudline. The difference between onshore and offshore is that the structures beneath the water can

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leave in-situ but can be removed if it is difficult to navigate or interfere with commercial fishing activities [23]. Currently, the decommissioning of offshore and onshore oil and gas operation is a complex process especially for oil matured fields as it can take several years. There is no clear evidence of decommissioning legislation that specifically addresses its inherently complex issues with specific reference to oil and gas infrastructure. However, there are international laws guiding oil and gas operators on decommissioning such as:

- The 1958 Geneva Convention on the continental shelf states that no exploration or exploitation in the continental shelf should interfere with fishing or the conservation of living resources of the sea, oceanographic or other scientific research with the intention of open publication.
- The 1982 United Nation Convention on the law of the sea: presents comprehensive laid-down rules guiding all users of the oceans and their resources. UNCLOS places interest on the protection and preservation of the marine environment and it requires states to prevent, reduce and control pollution of the marine environment [24]. It states explicitly that coastal states are the primary regulators of offshore activity hence giving them the exclusive right to authorize and regulate drilling on the continental shelf for all purposes [25].
- London Dumping Convention and Protocol (1996): It laid emphasis on the prevention of Marine Pollution by Dumping of Wastes and Other Matter which was later forced in 2006. The London Protocol also places a strong emphasis on the Polluter Pays Principle, which holds the party generating pollution accountable for any environmental damages [24]. The protocol also upholds the precautionary principle, where a lack of full scientific certainty will not be accepted as a good enough reason for postponing cost-effective measures.
- The Convention for the protection of the Marine Environment of the North-East Atlantic (OSPAR convention) 1998: position a clear argument that any delay in action on decommissioning will not only be more costly to society and nature but would compromise the rights of the future generation.
- The EU Energy Charter Treaty (1998) - it is seen as a positive instrument that encourages the promotion of international cooperation in the energy sector.
- The Petroleum Act 1998 states the exclusive right to petroleum and natural gas resources in a country and its territory.

3.1. The Concept of a Matured Field

The role of Middle East particularly the Arabian Gulf countries in the oil and gas industry cannot be over emphasised. Their reserves are very important as the region contains more than 40% of the world's oil and gas. Bahrain depends on oil and is still active in the field of oil discovery and land enhancement to increase the oil productivity. However, Bahrain is a mature field given the age of the oil fields, and production projected decline shown in Figure 1. Bahrain is currently developing the old Awali oilfield, which is more than 78 years old using new enhanced oil recovery techniques.

Production of Bahrain field had been declining over the years but has managed to increase back from 29 x 10^3 to 40 x 10^3 barrels per day. The forecast is that production will treble to around 100 x 10^3 barrels per day in the next 5-7 years leading to a substantial increase in revenue for the government. However, these predictions were thwarted as by foreign partners deciding to exit the joint venture over-seeing the project. This paper reaffirms that these are classical signs of a mature province as seen in Figure 3. Therefore, there is a need for Bahrain to put a decommissioning plan in place as the production will either further decline over time or the cost of production will increase arising from the use of enhanced technologies making the field not viable.

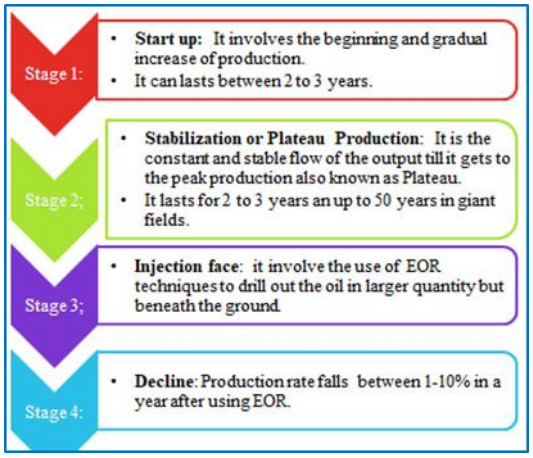

Figure 3. Classical Stages of Oil Field Production

3.2. The Need for Decommissioning Plan

At the point when operational cost is greater than revenue such assets have reached their economic life and it is no longer viable hence production will cease. It is therefore reasonable for operators to put in place a viable decommissioning plan. Considering the age of the Bahrain field and the use of different technologies to enhance the recovery of oil, the infrastructures might be dilapidated. Therefore, decommissioning will help to protect the

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environment, preserve the integrity of the oil company, avoid leakages underneath the ground and closely restore it as it was before operation began. In the UK, decommissioning is an obligation stipulated in the Petroleum Act 1998 [21] as well as subsequent legislations.

3.3. Challenges of Decommissioning

The increased rate of bankruptcy and global drive towards renewable energy has created a significant uncertainty to the oil and gas industry. Establishing the appropriate techniques to minimise or eradicate foreseeable environmental and safety risk involved in decommissioning can be tasking. There is limited technical knowledge to manage the societal and economical aspects given the complexities of decommissioning [26]. Decommissioning of aged infrastructure is challenging especially when the original design did not consider decommissioning. Another challenge is when emphasis is placed on benefit maximisation.

3.4. UK Decommissioning Practice

Currently in the UK, decommissioning is an important aspect of the oil and gas value chain, and the legislation places this responsibility on the operators to remove all infrastructures on the seabed, subject to some exemptions. The Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) is the expertise under department for Energy Security and Net Zero (DESNZ) that is delegated to handle decommissioning in UK and the regulating guidelines are partly contained in the Petroleum Act 1998 and its subsequent amendments - Energy Act 2006 and Energy Act 2016.

3.5. Proposed CSR for Decommissioning

CSR should be seen as programme of actions to reduce externalised costs or to avoid distributional conflicts - it helps in achieving cleaner ways of decommissioning. Bahrain oil and gas operators are expected to use technologies that will reduce environmental impact on the society. They are expected to be proactive and adhere to regulatory frameworks including international best practices that promote sustainability. Currently Bahrain is facing challenges because of early retirement of employees by the state government which also has a negative impact on the oil and gas sector.

Given that CSR is a continuing commitment by organisations, there is a need for the oil and gas industry in Bahrain to be ethical and contribute to the economic development by improving the lives of the workforce, families and society at large. Key areas that Bahrain oil and gas operators will be assessed would include cash flow, employee satisfaction and customer satisfaction.

4. Conclusion and Future Work

Our research work positions a sustainable decommissioning plan and application of CSR in the matured province of Bahrain. Given the important contribution of crude oil in the economic development of Bahrain, it is equally worth planning the decommissioning phase of her matured fields. A holistic view of the dimensions involved in decommissioning process should be adopted. Considering the age of the Bahrain field and the use of different technologies to enhance the recovery of oil and given that there is no clear evidence of oil and gas decommissioning legislation in Bahrain, however, there are international laws guiding oil and gas operators. Given that CSR is a continuing commitment by organisation, there is need for the oil and gas industry in Bahrain to be ethical and contribute to the economic development by improving the lives of workforce, families and society at large because it has been revealed to have significant relationship with organisational performance. Future work in respect of decommissioning plan and CSR will include visitation to various sites in the Global South in an attempt to produce a viable and sustainable plan that addresses the specificity of various regions.

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