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Local Content Implementation Enhancement through Infrastructure Development in Ghana's Oil and Gas Industry

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Authors' contributions

This work was carried out in collaboration among all authors. Author KAO designed the study, performed the analysis and wrote the first draft of the manuscript. Authors BB and PB managed the literature searches and reviewed the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Since the discovery of oil and gas (O&G) in commercial quantities in 2007, Ghana has made some progress in passing several policies such as Local Content and Participation Framework, ostensibly to stem the effects of resource curse – connotes countries with more natural resources turned to be undeveloped than countries without natural resources. Put it differently, the country's local content is meant to stimulate industry development by indigenizing the needs of the petroleum industry. However, the above aim is constrained by the country's infrastructure deficit of about US\$ 2.5 billion annually needed to provide the enabling environment for the growth of indigenous companies. The study, therefore, is to propose policy options for enhancing local content implementation through infrastructure development. To that end, the policy implementation in Angola, Brazil and Norway is reviewed, and the research participants are purposively sampled and interviewed. Consequently, the study found that the regulatory institutions and legal framework should be strengthened to attract private investment in infrastructure development. In addition, a

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special provision should be inserted in future petroleum contracts to support the Infrastructure Fund; through infrastructure-for-oil trade; and encouraging voluntary contribution from oil companies in exchange for reduced taxes into the Infrastructure Fund. The findings contribute to the existing literature in local content development by moving the discussion from training, local employment and goods and services targets to developing host country's local infrastructure for sustainable development of indigenous and foreign businesses.

Keywords: Local content; Ghana; infrastructure; oil and gas.

1. INTRODUCTION

Resource-rich developing countries can increase the value contribution from their resources (minerals, oil and gas etc.) to stimulate socio-economic growth and development through two main routes - fiscal policy and non-fiscal policy measures [1,2]. The former has been the usual means of generating revenue to a host country's coffers through royalties and tax instruments. On the other hand, non-fiscal policy measures come in the form of what is called Local Content Policy (LCP) [1]. The policy aims to leverage the petroleum value chain to generate sustained and inclusive economic growth through economic diversification and employment opportunities [3]. Indeed, the LCPs are used to support broad-based economic growth was first introduced in the North Sea in the 1970s which ranged from direct restrictions on imports to direct state interventions [4].

Similarly, the LC policy introduction in Ghana, *inter alia*, seeks to promote value-addition and job creation via the use of domestic goods and services and develop local capacities in the industry's value chain through education, skills transfer and technology transfer [5]. The significant discovery of petroleum at Ghana's Jubilee field in 2007 promoted several studies on how best to maximize benefits from its resources. These studies were initiated to avert Ghana from joining the bandwagon of resource-cursed countries in Africa and mostly centred on LCPs and its derivatives: Governance; sectorial linkages; LCP enhancement; and Country's Vulnerability. For instance, Ablo [6] examined the forms of linkages the Enterprise Development Centre (EDC) promotes under LCPs and argued that the centre facilitates interaction between local players and international oil companies (IOCs) which enhances local entrepreneurs' knowledge in the sector [6]. Also, Senoo and Armah [7] studied the effectiveness of Ghana's LCP and concluded that the LC legislation aligned within the political, social, and economic context and stakeholder participation do not

support effective implementation. Similarly, ACEP [8] studied the achievements, challenges and the way forward of the LC policy. It argued that the policy has created employment, increase usage of local goods and services but challenges remain in the area of financial support to local firms, enforcement system, and a disparity between local and expatriates' salaries. However, one critical area which has not been studied is the issue of local infrastructure for propelling LCPs which is argued to be one of the factors impeding the policy implementation in Africa [9,10,11]. The presence of local infrastructure is argued by Heum et al. [11,12,13] to be one of the critical variables needed in local content development in a host country's petroleum sector.

The variable of local infrastructure consists of social infrastructure, educational infrastructure, institutional infrastructure, business development infrastructure, and information technology. Public utilities such as electricity, roads, telecommunications, water supply, railways and air transport which are critical business development infrastructures help create a conducive environment for business development and productivity [13]. The quality of the above areas will among others influence profitability considerations for investments decisions [14]. In other words, a stable environment attracts foreign direct investments (FDI) and makes technology transfer possible [12]. They further argued that social infrastructure reduces the chances of social disorder thereby promoting social cohesion between different social groups. Likewise, IT infrastructure has a substantial impact on local content development through information dissemination which helps to foster local content in the O&G industry [14]. Apart from the above, they further argued that to improve local skills and capabilities and bridge the gap between local and international companies in terms of technology it starts from building industrial infrastructure [14]. In view of the above, the paper will answer the following questions:

- Is there a relationship between infrastructure and local content development in Ghana's oil industry?
- What are the policy options for bridging the infrastructure deficit in Ghana's Oil industry?
- What are the generic policy lessons from the case countries?

Accordingly, cases from Angola, Brazil and Norway will be reviewed and interviews are conducted to answer the above questions. This, therefore, provides a basis for recommending policy options for enhancing local content implementation through infrastructure development. The paper introduces a new angle to the debates on local content development by focusing on local infrastructure development to enhance local content policy implementation.

2. LOCAL CONTENT IMPLEMENTATION IN GHANA

Ghana local content (LC) is defined as "the quantum or percentage of locally produced materials, personnel, finance, goods and services rendered in the petroleum industry value chain and which can be measured in monetary terms" [15]. The driving force behind the policy is to create inter-sectorial linkages in the wider economy and facilitate the utilisation of indigenous human and material resource in the petroleum industry [16]. The LC law established a Local Content Committee to oversee, coordinate, and manage the development of LC, preparing guidelines, to include targets for LC reporting, and undertaking LC monitoring and audits. The act also proposes the establishment of Oil and Gas Business Development and Local Content Fund to support local capability development through education, training, research and development in the industry [5]. Subsequently, an Enterprise Development Centre (EDC) has been established to enhance the capacity of local businesses to meet the standards of the petroleum industry, which is currently limited in its impact on Ghanaian SMEs [6]. Despite this, EDC has made tremendous progress in building the capacity of local businesses through targeted training such as health, safety and environment (HSE), business and financial management, and procurement policies and regulation etc.

The LC law is believed to have been successful in terms of people employed in the Ghana's oil and gas industry. For example, in Ghana's oil industry 6,900 is estimated to be employed in the

industry, over 90 per cent are Ghanaians, out of which 40 per cent is in managerial position (lower and mid-level) [17]. In supporting the positive impact of the policy, ACEP [8] argued that it has created jobs for about 5,590 locals as of 2015 out of which 6,940 were employed in the upstream sector. However, it is believed that the targets set by the government within the LC policy framework is over-ambitious, prescriptive, and overemphasises domestic ownership, and making the schedule difficult to implement given the limited timeframe of 10 years to achieve the said target [11]. Table 1 shows the government target of at least 90 per cent full local participation in all aspects of the O&G value chain by 2020. Additionally, they argued that the regulations ignored the country's developmental state making it difficult to achieve such a target.

For instance, the infrastructure deficit in Ghana is estimated in the range of about \$90 billion [18]. Forster and Pushak [19] estimated that Ghana has to raise its annual expenditure to US\$2.3 billion to address the country's infrastructure challenges. Furthermore, they assert that although the country spends \$1.2 billion per year on infrastructure development, equivalent to 7.5 per cent of GDP [19] no significant impact has been realised. Petroleum revenue management law in Ghana requires a portion of the petroleum revenue to be used for infrastructure development. Since 2011, it is estimated that the country has earned over \$3.7 billion from the petroleum resources as of June 2017 [20]. Out of this amount, over 50 per cent has gone into financing the annual budget, and the rest to the state oil company, Ghana National Petroleum Corporation (GNPC) and Ghana Petroleum Funds. To bridge the infrastructure deficit, the government decided to use a portion of the resource rents in financing critical infrastructure as stipulated in the Petroleum Revenue Management Act (PRMA) 815. According to Section 21 (3) of PRMA 815, in the absence of a national development plan, the Annual Budget Funding Amount (ABFA) shall focus on key areas such as:

- Agriculture and industry,
- Physical infrastructure,
- Developing alternative sources of energy,
- Public safety and security, and
- Environmental protection, sustainable utilisation and the protection of natural resources [21].

More importantly, the act requires the benchmark revenue allocated to the budget to be in tandem

with medium to a long-term development plan, and to be reviewed every three years after the commencement of the act. Additionally, the act created the Ghana Petroleum Fund. This fund comprised of the Ghana Stabilisation Fund and Ghana Heritage Fund and is to cushion the impact of oil prices fluctuations on the international market as well as to save for future generations respectively. Furthermore, section 23 (1) states “commencing in the year 2011 until the year when petroleum production ceases, the following rules shall apply: (b) a minimum of thirty per cent of the excess revenue determined in subsection (1) (a) shall be transferred into the Ghana Heritage Fund and the balance shall be transferred into the Ghanaian Stabilisation Fund each quarter (PCG, 2015b). Despite the above regulations, Ofosu-Peasah [20] argued that the government was non-compliant with the above provision of minimum of 30% between 2011 and 2016. ACEP [22] critiquing the act argued that the areas listed under section 21(3) for oil revenue usage is non-restrictive allowing the sector minister to use the discretion granted him within section 21(3) and (5) of the act. For instance, they posit that, between 2011 and 2016, the government prioritised amortisation of loans for O&G infrastructure, roads and other critical infrastructure, capacity building, and agriculture modernisation. Furthermore, they moot that ‘capacity building’ allows the government to invest in a wide range of areas thereby defeating the fundamental purpose of prioritisation. Again, the Ministry of Finance has not been unable to report completion status of oil revenue-financed projects thereby flouting section 48 (2) b of the act [22]. The net effect of all this is that the government of the day tend to use oil revenue as they see fit without investing the oil money to lay a solid foundation for the growth of domestic companies.

According to World Bank’s Ghana’s Infrastructure: A continental Perspective report, improving the country’s infrastructure level to that of the region’s middle-income countries could boost annual growth by more than 2.7 percentage points [23]. To fix this infrastructure deficit, the World Bank puts the figure around \$2.3 billion per year over the next ten years, divided fairly between investments on one hand and maintenance on the other [23]. Furthermore, the Bank estimates that during the 2000s, infrastructure contributed a little over one percentage point to Ghana’s improved per capita growth performance but unreliable power supply held growth back by 0.5 percentage points. This

intermittent power supply creates an unfavourable environment for businesses to thrive, and thereby reducing the capacity of local firms to supply manufactured goods to the oil industry. Similarly, having an effective transport system, for instance, will create a conducive environment for businesses to obtain raw materials and provide goods and services. In a nutshell, developing infrastructure for business development (transport infrastructure, electricity, and water etc.) will constitute a conducive environment for the development of domestic companies as intended by the LC policy and ensures positive spill-over to the non-petroleum sector of the economy. This ultimately helps in ensuring the diversification of the economy.

3. CASE COUNTRIES

3.1 Angola

The objectives of Angola local content are to ensure the Angolanization of the workforce and local sourcing of goods and services. This policy of Angolanization of the country’s workforce started in 1979, with law 10/79 giving Sonangol exclusive rights over the country resources. However, due to inadequate technical capabilities, the state-owned company was allowed to partner with international oil companies for knowledge transfer [24]. In 1982, a decree was issued, 20/82 of 1982, to “endow the People’s Republic of Angola with national personnel able to assure the functioning of the economic key sectors” [25]. The above decree laid the foundation for LC in the country’s O&G workforce which covers recruitment, training and career progression. Apart from the above, domestic sourcing of goods and services are enforced through Decree 13/03 of 2003 which is meant to achieve: (i) socio-economic development; and (ii) fairness in the distribution of the country’s wealth (ibid). In terms of institutional responsibility of LC implementation and monitoring, the Ministry of Petroleum is responsible for LCPs formulation and regulation of Angolanization of the workforce. Recruitment and training by companies have to be approved on yearly basis by the sector ministry and is monitored through an annual implementation report submitted to the ministry which reports progress against the plan, the challenges encountered and proposed solutions. Tordo et al. [4] argued that LC policies have helped Sonangol to develop over 20 joint ventures with IOCs to supply core and noncore goods and services to

Table 1. Policy measurement for the next 10 years

Item	Policy implementation period		
	Initial year	5years	10years
1. Goods and services	10%	50%	60-90%
2. Recruitment and training			
(a) Management staff	30%	50-60%	70-80%
(b) Technical core staff	20%	50-60%	70-80%
(c) Other staff	80%	90%	100%

Source: Ghana Local Content Regulation 2013

the industry. Furthermore, it is argued that LC policy has created new businesses which supply goods and services previously supplied by international companies [17].

However, there are challenges still confronting LCPs implementation that hinders the policy of Angolanization and preferential treatment of small and medium-sized enterprises (SMEs) growth, and even the international oil companies and the service companies. One of the challenges facing IOCs operating in Angola is the issue of infrastructure despite favourable economic climate in Angola, the current transport and logistics infrastructure remains a major problem in the country [25,26]. This problem is partly due to the 27 years of civil war (plus years of neglect and lack of maintenance) which left most of the country's physical infrastructure in destruction, especially in rural areas [24,27,28]. However, the country spends almost \$4.3 billion per year on infrastructure with most of the funds skewed toward transport [29] predominantly funded by domestic fiscal resources, and China, a source of external finance through "infrastructure-for-oil trade" agreement [26,30]. This policy of "infrastructure-for-oil trade" has resulted in the expansion of rail infrastructure and housing in Angola [30]. This policy is similar to Nigeria's Content Development Fund for financing infrastructure development. In Ghana, infrastructure fund has been created to support the development of infrastructure in key areas of the economy as in the cases of Nigeria and Angola.

3.2 Brazil

In 1864, oil was first discovered in Brazil but took over seven decades for the commercial quantities of oil to be discovered in 1939. As of 2016, the country produced 3.24 million b/d of petroleum making it the ninth-largest producer in the world and the third-largest after the United States and Canada in the Americas [31]. During the early phase of the oil industry, full ownership of the oil and gas fields were vested in the state

thereby monopolizing the rights for exploration, transportation, distribution and marketing [25]. For instance, the decrees 336 of 1937 and 395 of 1938 nationalised the O&G sector and its related products. However, a new government in 1945 liberalised the industry paving way for foreign companies to obtain licenses for concessions. In 1953, a new government re-nationalised the industry through law number 2004 creating the state-owned company, Petrobras with monopoly rights over all upstream operations and to help promote domestic sourcing of goods and services (ibid). Brazil adopted import-substitution industrialization like many governments in Latin America aimed at producing national industries to reduce the dependency on imports [32].

The state took a leading role in developing the oil and gas industry in Brazil. As of 2013, it was estimated that Petrobras produced 1.9 million barrels per day (bpd) out of the 2.7 million produced in the country [31]. In addition, Petrobras controls over 90 per cent of the production of oil and gas in the upstream and has considerable control over transportation (pipelines) through its subsidiary, Transpetro. By 1960, the number of domestic suppliers to the oil industry had supplied more than 60 per cent of the material and equipment sourced by the state-owned oil company [25]. In 1997, an Oil Bill was passed which fully liberalised and created a new regulatory body to supervise the petroleum activities in the upstream industry. The bill created the National Agency of Petroleum, Natural Gas and Biofuels (ANP) linked to the Ministry of Mines and Energy (MNE) [11]. Today, Petrobras plays a leading role in deepening and implementing the country's local content requirements. The LC policy is linked to the country's overall industrial strategy aimed at protecting domestic industry and increasing local firms' competitiveness [25]. Basically, local content policy in the Brazilian oil industry is to create job opportunities for locals, improve domestic capabilities, improve domestic technological development, and develop national industry participation in the sector on a

competitive basis [33]. To that end, oil companies are required to submit LC plan committing to the acquisition of domestic goods and services, and decisions for licenses are mostly based on this [11]. In addition, bidders are expected to outline the minimum exploratory programme and the signing bonus and the percentage of local content they will commit to which are used in calculating a points system to rank the bids (ibid). In terms of credit support for local suppliers, the Brazilian National Development Bank (BNDES) impose a minimum LC requirement to offer financing facilities to local suppliers in the industry (ibid). Secondly, the development bank provides loans at lower rates for industrial purchases of machinery and equipment aimed at technological development [32]. Apart from the general requirement of LC in Brazil, there are fiscal incentives i.e. tax reductions for compliance, quotas for a preferential purchase of domestically produced goods in government tenders and subsidized financing [34]. Oil companies are required to invest 1 per cent of each field's gross revenue in O&G related R&D- half of the amount in the company's research facilities and the rest in local universities and research institutes accredited by ANP [35].

3.3 Norway

In 1959, the North Sea emerged as prominent O&G producing region after gas was discovered off the coast of the Netherlands, [2] which led to series of agreements between the UK, Denmark, the Netherlands and Norway. In 1965, the Norwegian Petroleum law was enacted to enable O&G exploration. In 1972, the government passed a royal decree (article 54) to regulate local content thereby ensuring local goods and services are given preferences provided there were competitive (price, quality, service and schedule) [34]. In addition to the above, Goods and Services Office was established to monitor and collaborate with IOCs in developing a domestic industry, encouraging joint ventures and research and development, and establishing targets for indigenous participation in the industry (ibid). Foreign companies were also required to set operational subsidiaries in Norway and also encourage the recruitment of locals. To encourage the use of local goods and services, the government set up a Supplier Development Program which focussed on enhancing production links between foreign companies and indigenous firms which helped created industry clusters [36].

In the early stages of Norwegian industry, preference was given to companies that partnered with locals' firms. By 1965, it was a requirement for government equity participation in any offshore development [34]. Furthermore, the government established a state-owned company, Statoil to participate in oil exploration. In countries such as Brazil and Kazakhstan, LC is considered as a strategic tool for overall economic development whereas, Norway and the UK had a different strategic vision towards LC [2]. The latter countries focussed on sectoral catch up within their economies. This presupposes that, at the beginning of legislation of LC, there must be a clear vision as to what the policy is meant to do- sectoral catch-up or economy-wide catching up cognisant of the host country's capabilities and capacity. In the case of Norway and the UK, Kalyuzhnova et al. [2] argued that both countries were not at the technological frontier concerning O&G exploration and development during the early phase of exploration. Furthermore, they argued that Norway had no petroleum service and supply industry, no R&D sector and with no sectoral institutions to manage the resource but had an advanced shipbuilding industry, engineering base and the third largest fleet of ships in Europe.

Supporting the above arguments, Heum [37] argued that Norway has been successful due to active state involvement and regulation, and the utilisation of existing industrial and engineering capacity and capability to develop an international O&G service and supply industry. In other words, through government interventions, and existing infrastructure and industrial based local companies were developed and propelled to international standards. From a growth perspective, a well-crafted LC can lead to capital accumulation and demand for domestic production with greater economic benefits [2]. In so doing, the policy helps increase the spin-off effects from O&G development via legislating domestic participation in offshore and onshore activities. In order to achieve these economic spin-offs, the policy must mandate or incentivise oil companies and its related businesses to establish their activity within the host country and employ locals as happened in Norway (ibid).

4. METHODS

Qualitative data in the form of interviews was adopted in the collection of primary data in Ghana. Qualitative research seeks to provide an extensive understanding of people's perspective,

opinions, experiences and histories within a specific context [38] which aligns with the objectives of the study. Secondly, the adoption of the above method allows the researcher to delve deeper into the phenomenon under consideration which quantitative does not offer. Therefore, this method was considered appropriate in achieving the objectives of the study. The interviews consist of both one-on-one and online interview. The study starts with reviewing academic publications and policy statements on local content implementation on the study area and the other case countries of Angola, Brazil and Norway. These countries were chosen based on their long years of LC implementation on three different continents. Lesson are drawn from the case countries with respect to the phenomenon under study. This is followed by interviewing stakeholders in the Ghanaian oil and gas industry. Purposive and snowball sampling was used to identify participants who have a deep appreciation of the subject matter, relevant skills and experience and can help in answering the research questions. Semi-structured interviews were, then, conducted using an interview schedule which encompasses questions on the research objectives. In designing the interview schedule as argued by Gill et al. [39], it is essential to ask pertinent questions that will yield more information to answer the research questions. Furthermore, good questions in qualitative research should be open-ended, neutral, sensitive and understandable [40] are points considered in drafting the interview schedule.

5. RESULTS AND DISCUSSION

The qualitative data focus on two broad areas: the relationship between infrastructure and effective local content policy implementation; and policy options for developing resource infrastructure in a host country. On the former question, the research participants agreed that there is a direct relationship between infrastructure and effective local content policy in Ghana's oil and gas industry. One respondent said "inadequate infrastructure in terms of erratic electricity supply and poor roads are increasing the cost of business operation. Imagine we (local company) have to buy petrol on a daily basis to power our generators. It is unbearable that we can even break-even". Concerning the institutional aspect of infrastructure, there was general agreement that the O&G institutions perform better than the mining sector in Ghana. One respondent argued "So, I think at the

institutional level some capacity has been built and the guys in charge of that are doing ok and the regulation quality is actually not that bad. The oil and gas institutions run better than mining institutions as the former learnt a lot of lessons from the mining sector."

Others argued that you would have expected the government to assist in developing industrial enclave in the oil city of Takoradi to provide local services to the oil industry. Rather it is the private sector which has taken upon itself. Also, it was argued that there is no overarching industrial policy for the country and how the oil sector fits in, and the general policy is haphazard. As a result of that, each political party comes to office with its policies, and whenever there is a change of government the new party discontinues the erstwhile government policies. The net effect of all this is that the government of the day tend to use oil revenue as they see fit and for political patronage without following a well-thought-out industrial plan. Furthermore, regulatory institutions and legal framework should be strengthened to attract private participation in infrastructure development. Consequently, strengthening regulatory institutions, will invariably, eliminate unnecessary red-tape and streamline the processes and procedures in the sector application. Secondly, fiscal incentives can be used to complement and attract private investment in infrastructure in key areas of the economy.

Broadly, the generic lessons from local content implementation from the case countries as they relate to Ghana's oil and gas industry: establishment of regulatory institutions to implement and monitor the policy; Norway's local content policy was predicated on existing state's capabilities which propelled the growth of local businesses in and outside the oil sector; implemented discretionary licensing system, audit oil companies' purchases and offered financial support to local companies; the rigorous development of R&D centres in the case of Norway and Brazil; and independent state institutions have the responsibility to plan, monitor and report LC, and the policy is state-led intervention in all of the countries. Especially in the case of Norway and Brazil, active state involvement and regulations coupled with the utilisation of existing industrial and manufacturing capacity, the above countries developed international competitive oil-related industries.

These successes were possible in the above countries because of pre-existing industries and

adequate business infrastructure to support domestic companies' growth. In Norway and Brazil, the country was relatively developed as compared to Ghana and Angola before the discovery of oil. In the case of Angola, logistics and transport infrastructure etc. was destroyed the country's 27 years civil war. Consequently, the government has adopted a new policy in the form of "natural resource in exchange for infrastructure". In other words, the use of infrastructure-for-oil trade to bridge infrastructure deficit which invariably will create the enabling environment for the growth and increase the probability of local companies and suppliers. This policy involves trading natural resources such as minerals or petroleum in exchange for infrastructure project normally deemed important by the government. Similarly, Nigeria has introduced Content Development Fund to finance infrastructure development.

6. IMPLICATION AND CONCLUDING REMARKS

This paper has attempted to broaden studies on local content development in resource-rich countries by shifting the discussion from LC mandatory targets (employment, training etc.) to infrastructure development to propel LC development. To that end, policy options have been recommended for bridging the infrastructure deficit of Ghana. Four years of local content implementation in Ghana has seen mixed successes. There is evidence of local firms' participation in the value chain through mandatory joint venture (JV) requirement for foreign oil companies' participation in the Ghanaian petroleum industry. To ensure sustainable development of indigenous firms, local infrastructure must be developed as one of the key enablers for local content development. This paper, therefore, proposes the following ways of financing the infrastructure deficit in Ghana to propel sustainable LC development:

- Strengthening of regulatory institutions and legal framework to attract private investment in infrastructure development. Strengthening regulatory institutions, it will help eliminate unnecessary red-tape and streamline the processes and procedures in the sector application.
- In future petroleum contracts, a provision should be inserted to allow a percentage of contributions to be made directly to the Ghana Infrastructure Fund. This should be

done in collaboration with oil companies and service companies.

- Encourage a voluntary contribution from oil and gas companies to the Ghana Infrastructure fund for reduced taxes, and a database created to that effect for accountability and transparency.
- Diversifying the economy by investing a chunk of the resource rent in infrastructure than recurrent expenditure either wholly or public-private partnership.
- There should be a long-term industrial policy for the country with specific sectoral policies across the wider economy.
- The government should increase resource revenue for infrastructure development and the development of an industrial base. Here, as one respondent said, "there should be a depart from the current situation in which petroleum revenue allocated to the annual budget is widely spread on many projects without any positive spill-over effects and the lack of status report of oil-financed projects.
- The use of infrastructure-for-oil trade as practised in Angola.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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