OVERVIEW OF ENVIRONMENTAL MANAGEMENT FOR OIL AND NATURAL GAS SUB-SECTOR IN TANZANIA

By Ian Shanghvi and John Antony Kiang'u Jingu

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1.0 OBJECTIVES OF THE PAPER

This paper incites positive thinking and action on the side of stakeholders, particularly the Government, in ensuring that the discovery of natural gas in Tanzania transforms into a resource blessing rather than what is usually referred to as resource curse, with the latter having become a common African phenomenon. Natural resource endowment in Africa has been cited for provoking civil strife in many countries, with classic examples being set by countries like Nigeria, Cameroon, Congo Brazzaville, Congo DRC, and the Central African Republic.

Civil conflicts have culminated into blood sheds that have claimed the lives of many Africans in addition to dislocating social ties, leaving hundreds of thousands of people with permanent disabilities, and plunging people into dismal poverty scenarios. This does not have to be the norm. As this paper recommends, best management practices are within rich of the Government and other stakeholders to transform the resource into a factor of stability and sustainability in social, economic, environmental, and geo-political terms – for the current and future generations – while aiming to achieve poverty alleviation.

2.0 INTRODUCTION

Natural resources ought to be utilized for realization of the benefits of the people in the country in which they are found. This right of the people to enjoy benefits of natural resources found in their country has been sanctioned by UN resolutions 626 (VII) of 1952 and 1803 (XVII) of 1962, which states that states and their people have permanent sovereignty rights over natural resources found in their countries. Tanzania is abundantly endowed with natural resources, which have the potential to play an important role in promoting its socio-economic growth and development. Its natural resource endowments range from forestry and wildlife to mineral resources; natural gas and oil to fish; and attractive mountains to a long and beautiful coastline blessed with abundant marine resources and exceptionally attractive beaches. Other resource endowments in the country include woodlands, rivers, lakes, and wetlands.

Despite its vast natural resources base, the irony is that Tanzania remains one of the world's poorest countries (Aikaeli, 2010; CIA, 2011; Sarris & Karfakis, 2006); with the Human Development Index score ranking the country at 151 out of 182 countries (Aikaeli, 2010). The country is also poorly equipped with physical and social infrastructure, with a majority of its people not having a permanent place to live and half of the population living below the poverty line (International Labour Organization [ILO], United Nations Industrial Development Organization [UNIDO] & United Nations Development Program [UNDP], 2002). (ILO, UNIDO & UNDP, 2002). The overall economic infrastructure is said to be aging (Netherlands-African Business Council, 2012). The economy also suffers from a persistent trade deficit that leads to a stringent loss of the country's already-scant foreign-exchange reserves as well as slowing down its economic growth. The balance of trade has averaged -286.9 million USD from 2006 until 2012 (Trading Economics, 2012).

Apart from its pervasiveness at the national level, poverty in Tanzania is significantly a rural phenomenon (Aikaeli, 2010; Sarris & Karfakis, 2006). Sarris and Karfakis note that approximately 40% of rural households live below the basic needs poverty line and make up around 80% of the poor in the country. Again, in addition to being rural in character, poverty reveals itself more with women than men. It is observed that 60% of women in Tanzania live in conditions of extreme poverty (URT, n.d.), with female-headed rural households having lower per capita income than their male counterparts (Aikaeli, 2010). The incidence of poverty is said to be severest in remote and semi-arid regions of the country (Morris, et al., 2001; YouFeedThem [YFT], n.d.). The highest incidence of poverty among rural families living in these regions stems from a limited diversification of their economic activities. According to YFT, most of them are exclusively dependent on the agricultural sector, particularly food crop production and livestock keeping. Clearly, regardless of geography and gender, poverty is highly undesirable and numerous policies and programs have been designed and implemented to fight it. Efforts are ongoing.

Currently, the extractive industry is one of the fastest growing industries in Tanzania. Recent natural gas discoveries bring with them a new hope to Tanzanians to address their myriad

socio-economic plights. The discovery of commercially viable oil and gas as well as array of minerals including rare earths have made Tanzania upbeat about the potential of economic prospects. The exploration of natural gas in Tanzania has been underway since 1952, with the first natural gas discovery made in 1974 at SongoSongo Island (Lindi region) and the second discovery at Mnazi Bay (Mtwara region) in 1982 (Ministry of Energy and Minerals [MEM], 2012). However, the actual utilization of natural gas began in 2004. According to MEM, it was confirmed in 2010 that Tanzania has large quantities of natural gas deposits, and more gas discoveries are expected. MEM adds that natural gas discoveries of 33 trillion cubic feet were made from both onshore and offshore basins, whereby onshore sites (comprising 8 trillion cubic feet) include SongoSongo, Mnazi Bay, Mkuranga, Kiliwani North and Ntorya. Other natural gas sites are located in Katavi, Kyela, Singida, Tanga, and Lake Tanganyika.

3.0 STATE CAPTURE

Tanzania must be aware of the dangers of what comes with resource wealth through what is termed as "state capture." This is the situation where a few private interests seek to strategically influence the design of the emerging rules of the game (policies, laws and contracts) to their enormous advantages and at the expense of the interests of the wider society. In that way, state actors are reduced into agents of serving interests of actors at the expense of the interests of the people. Under such a situation, instead of becoming the source of social-economic developments, they may become the source of conflicts, violence, poverty, corruption and dictatorship. Moreover, state capture negatively affects political and economic development. It also leads to formation of distorted institutions. Such symptoms of state capture have erroneously been termed the "African resource curse". In fact, the African Report (2013) noted Africa does not suffer from a "resource curse"; it suffers from bad policies and bad governance of its natural resources. Indeed, it suffers from policies tilted to serve interests of a few at the expense of the wider society. In fact, oil resources have contributed to emergence of violent political conflicts, severe poverty, corruption, environmental damage and repressive regimes in top oil producing countries in Africa namely Nigeria, Libya, Algeria, Egypt, Angola, Sudan, Equatorial Guinea and Republic of Congo (Lawson-Remer, 2012; Andre, 2011).

3.1 Escaping State Capture

Tanzania and other new frontier countries in oil and gas industries must learn from experience of other countries which have been plagued with state capture and the consequent "curse.". Tanzania and other new comers in the oil and gas industry must utilize such invaluable lessons by adopting appropriate policies to avoid the curse. Indeed, with the ongoing discoveries of a vast potential of natural gas in the country, Tanzania must set in place deliberate plans to ensure that mistakes made in the extraction/exploitation of other natural resources in the country do not recur in the natural gas sub-sector. With appropriate policies, Tanzania has the potential of benefiting from its oil and gas as well as other resources to alleviate poverty and achieve sustainable socio-economic development. The following are important policy strategies in enabling the country escape from state capture.

3.1.1 State participation

The state should increase its participation in oil and gas industry if Tanzania is to benefit from its wealth. The role of the state in the economy especially in extractive industry is pivotal to safeguard and pioneer the gains from the sector. Instead of letting foreign companies control stakes in natural resources projects, it is important that the state controls bigger shares to enable it be a key partner in decision making processes. In that way, state participation, which is usually through state owned enterprises, ensures that benefits of natural resources flow to the people. In countries that have made progress with regards to mineral resources, the state plays an active role in all aspects concerning ownership, regulation, distribution and appropriation of benefits obtained from such resources. For instance, in Norway, the

state owns 67% of the shares of Statoil, a company that controls 80% of oil and gas industry in the entire country. This has enabled the country to accumulate a lot of wealth from the sector that has in turn, fostered development. Likewise, in Botswana, the state has a joint ownership with De Beers of 50-50% of Debswana, which is the world's number one producer of diamond. The state participates in sorting, valuing and in checking the sales of diamond and its production. Accordingly, the contribution of diamond to the GDP in Botswana has risen from 35% in 1967 to 51% in 2010 (Chanda, 2010; Mmolwa, 2007; Limi, 2006). The earnings from diamond are retained within the country and have helped in the transformation of Botswana from a poor country to a middle-income country (Chanda, 2010). This is in sharp contrast with the Tanzanian experience where the contribution of the mineral sector to the GDP was only 2.7 % in 2007 (The Mineral Policy of Tanzania, 2009).

However, it is important to note that, the Mining Act of 2010 sanctions state participation in mining activities through what has been termed as "government free carried interest". The Act defines free carried interest as shares that the holder enjoys without contributing equity capital. The Act holds that the state may acquire free carried interest and participate in mining on the basis of negotiations between the government and the holder of mineral rights. The notion of free carried interest suggests that the state, which owns minerals, is given favour of free shares since it does not contribute to equity capital. However, minerals, like other natural resources, are state property and that fact needs to be given weight in the negotiation of joint deals. Indeed, mining companies acquires capital to develop mineral projects after trading the value of deposits in stock exchanges, which negates the argument that mineral deposits are not properties before exploration.

3.1.2 Transparency and Accountability

Transparency facilitates partnership of various stakeholders in the country to ensure that they get a fair deal in concessions. Disclosure of production-sharing contracts and mining development agreements increases integrity and legitimacy of deals and, hence, their sustainability. On the other hand, secrecy increases the propensity of corrupt deals and public mistrust. Secrecy tends to be associated with under-the-table deals which by their very nature tend to attract opposition from the people and hence making them unsustainable. The benefits of transparency have made several countries and the companies to embrace it. Indeed, some companies such as BP in Azerbaijan already view secrecy of contracts and the perception that revealing contracts is a "commercially sensitive thing" as an "anachronism" (Africa Progress Panel, 2013, p. 76). Related to the above, there is a need of disclosure of payments to governments and intra-company transactions. Such a disclosure limits the possibility of shoddy deals due likelihood of increased public engagement in the processes. In that regard, Tanzania and other African Countries should embrace and emulate the US Dodd–Frank Act which requires companies in the extractive industry to fully disclose transactions with their subsidiaries and other related entities. In so doing, tax dodging that tends to come with such transactions may be limited and the government may be able to receive fair tax revenues.

Moreover, some countries in Africa have started to adopt transparency in extractive industry. For example, Guinea under President Alpha Condé attempts to get the country rid of state capture after coming to power in 2011 with the agenda to review all mining contracts. In 2012, the Government posted in its website more than 60 contracts including those by Rio

Tinto, BHP Billiton and Vale. Online posting of the contracts enables the people to scrutinize them with the view of ensuring that their interests are safeguarded (Africa Progress Panel, 2013, p. 71). Norway on its part has a Freedom of Information Law which requires extensive disclosure of information on the industry.

Transparency should also include the process of awarding concessions to companies. Several countries, including Brazil and Indonesia, award concessions on open and competitive basis. However, most successful countries tend to favour the home companies in awarding of such concessions. Thus, although Brazil uses competitive tendering in awarding concessions, most concessions tend to be awarded to a state company, Petrobras. Clearly, transparency limits the propensity to state capture because it allows the people in their various interest groups to scrutinize target rules of the game. However there is a need of effective accountability mechanisms to ensure that persons vested with state power are accountable to the wider interests of the society. Norway for example, has extensive accountability and effective legislative oversight of the functions of the Petroleum Department. In the same vein, in Brazil, the legislature has the power to oversee and review decisions of the government officials in any extractive project.

Moreover, lack of transparency in the management of African natural resources has limited the capacity of these resources to reverse poverty trends and promote multidimensional prosperities. In Africa, as elsewhere, lack of transparency goes hand in hand with limiting stakeholders' participation in the various natural resource value chains, with the consequence of spearheading numerous world-class conflicts. The conflicts do not only affect the local communities but also, in this case, natural gas developers and, eventually, the nation at large. In the absence of tranquillity and amid constant turmoil, peoples' activeness in development activities is steadily substituted with dire dissatisfaction and vengeance, resulting into colossal ramifications on the governments, their own lives, and operations of natural gas developers. The African Capacity Indicators Report (ACIR) correctly notes that failure to consider local populations affected by extractive resource investments puts such investments at risk (African Capacity Building Foundation [ACBF], 2013). ACIR further observes that attempting to resolve this can be challenging because local actors are normally excluded from certain contracts whereby, based on the smallholder perspective, the contracts can entail secrecy and lack of public consultation.

This scenario trumpets the essence of agency and of designed mechanisms to engage local level actors. In the process of ensuring unwavering transparency in the Tanzanian natural gas subsector, as Lloyd (2012) stresses, effective means of communication among the stakeholders need to be established to promote prolific dialogues and planning efforts. A well-planned stakeholder participation process leads to the legitimization of the projects by each stakeholder, making them develop without interruptions (Rorke, 2012; Vences, 2006). Communities must be fully engaged in identifying their priority issues, both short- and long-term. Fortunately, many investors usually understand the need to engage local actors (ACBF, 2013). However, this must go hand in hand with practically engaging the local actors in identifying ways in which their priority issues can be achieved relative to the development of natural gas. It is also important for the key stakeholders to form a task force to monitor change in these priority issues, plan for potential negative impacts, and put in place implementation plans that utilize opportunities presented by the natural gas industry (Lloyd, 2012). Transparency and communication of negations and resultant consensuses

between the Government and natural gas companies are necessary to build public faith and garner its support especially by clearing suspicions of corruption and betrayal. This should be accompanied by setting a forum for public debate in order to critically discuss and address extant and emerging worries among the members of the public. The overarching turning point should entail bridging the gap between decision makers and all other stakeholders, in a transparent and participatory manner. Mutch (2012) correctly cautions that "the wider the gap between those making decisions and those affected by them the greater the potential for misunderstandings and problems" (n.p). Stressing on the essence of transparency in the sub-sector, Mutch, for example, avows that gas drilling companies must disclose to the public what they are doing, their distribution of profits, and the jobs that have been and are to be created. The Government should ensure such disclosure and make sure it reaches members of the public. This, however, must be guided by specific legal enforcements.

Specific attention should also be paid to participation of the people in the policy processes. Successful countries in management of resources undertake their policy processes in a participatory manner and ensure that inputs from all levels and cadres of the society are accommodated. Instead of vesting many powers upon the minister, Tanzania can, for instance, learn from Botswana's model of making policies that concern minerals. As Beaulier (2000) stipulates, policy making in Botswana is a 'consultative process'. To ensure that people, even those at the grassroots are heard and their views are accommodated, Botswana uses traditional fora commonly called *Kogtla.* Such fora are deliberately established to offer an avenue for deciding and approving policy decision that are of national importance and among other issues, matters related to mining concessions and licences are worked out through Kogtla (Bryan & Hofmann, 2007, p. 20). Of interest to note here is that the discussions held in the fora involve the people and important officials like the president, ministers, and members of parliament, councillors and other public servants.

3.1.3 Improve negotiating powers

Oil and natural gas companies are said to be so powerful that they can steer Governments in the directions they choose. As Harford (2012) notes, the lobbying power in the hands of the oil and natural gas companies within the U.S. Government makes it difficult for the Government to be transparent enough about these companies. Consequently, this makes it difficult for the people affected by fracking to be compensated by these companies (Harford, 2012). A similar situation was encountered in Peru whereby the experience and size of Shell and Mobil (natural gas developers) were considerably larger than that of the Government and other stakeholders, thereby placing the developers in the upper hand in relation to bargaining power and resources (Vences, 2006). The fact that the U.S. Government, being such a powerful Government in the world, is overwhelmed by the power of oil and gas companies implies an even more complicated relationship between Tanzania and such companies. In fact, Tanzania's position before these powerful companies is aggravated by the fact that when they come to invest in developing countries they are usually backed by their powerful governments whom we also plead to for aid and other different kinds of support for our development. This scenario definitely wanes Tanzania's bargaining position since these companies can agree with Tanzania on one thing and achieve the other via the aid conditionalities imposed by their mother countries. Fortunately, the Extractive Industries Technical Advisory Facility exists to empower developing countries with negotiating skills and expertise in implementing policy and regulatory frameworks to manage mining,

oil and natural gas industries responsibly and transparently (Foreign Affairs, Trade and Development Canada, 2013). Another opportunity is provided by Canada's Secretariat of the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, which provides a unique global setting for ongoing discussions among developing countries on practical issues related to the sustainable management and development of the extractive sector (Foreign Affairs, Trade and Development Canada, 2013). The Secretariat provides a stage for dialogue between governments, mining companies and industry associations – at which Tanzania can air its concerns and receive required feedback and support. Though the overwhelming powers of the oil and natural gas companies may easily *contaminate* these arrangements, activities conducted by such institutions are a commendable point of departure.

It is also important to emphasize here that Tanzania needs to adopt the practice general tax structures instead of concession–by-concession to individual investors which tend to pit the government with the companies which tend to be better informed and resourced. Experience from Latin America and most of Asian countries proves the advantages of general fiscal policy over concession-by-concession system that tends to be cumbersome on part of governments (Africa Progress Panel, 2013, p. 77). Also Norway, a country which has managed to use its natural resources to significantly improve the wellbeing of its people, has concessions and fiscal terms standardized in its Petroleum legislation, leaving no discretion power among the ministry/government officials. In fact, the concession-by-concession system makes weak governments like Tanzania easy to be manipulated and corrupted.

3.1.4 Fair distribution of natural gas revenues

It is not the scope of this paper to describe how the distribution of natural gas revenues should be made, but it is worthy stressing that a fair distribution of the revenues is a critical factor of social justice. With poverty ravaging millions of Tanzanians in rural and urban areas, natural gas discoveries come as a new hope to them. Natural resource extraction is known for creating and aggravating asymmetries in wealth and increasing the gaps between the rich and the poor; which, as a consequence, play part in the institutionalization of corruption and give leeway for oppressive regimes to maintain their political dominance (ACBF, 2013 referring to Karl, 1997). Therefore, much as natural resource endowments entail a potential for economic and social development to African nations, this has not always been practically achieved because the mix of positive and negative effects has left awful impacts.

> *...the surge in export earnings due to new natural resource discoveries that, coupled with the rise in global prices of primary commodities, have had positive and negative effects. High export earnings from natural resources, though beneficial in terms of providing much needed resource and in spurring growth, also have brought with them socio-political and macroeconomic challenges. As a result, African development and policy discourse has been dominated by issues related to natural resource endowments, often focusing on whether or not these resources have enhanced the well-being of citizens (ACBF, 2013: p. 99).*

Thus, though expected to create economic wealth and prosperity, the mismanagement of the natural gas resource could cause economic imbalances and constrain growth in other sectors. On the basis of the fact that revenue management by incapable or corrupt structures

imparts negative consequences on a country (ACBF, 2013), the Nigerian experience reveals that corruption and mismanagement play a critical role in constraining development of a stable government energy policy (Ernst & Young, 2012). Lack of a stable policy implies lack of a steering principle or rule to guide decisions and achieve rational outcomes. This partly explains the reason why most Nigerians live in poverty despite the country's record of exporting most of its oil and gas (Ernst & Young, 2012).

The Government of Tanzania should determinedly ensure that revenues collected from natural gas proceeds practically transform people's lives and foster human development. Therefore, an equitable distribution of natural gas wealth would enable bridging the gap between the poor and rich while, at the same time, wearing down social and political strains (Andre, 2011). In actual fact, recent mayhems experienced in Mtwara were highly motivated by uncertainties of how the revenues will be distributed, particularly to the Mtwara people in relation to the rest of Tanzanians. Revenue distribution in this case takes different forms, ranging from cash to other cash-generating support mechanisms (e.g., factories, infrastructures, etc.) to provide people with employment opportunities and create a convenient environment for income generation. Bolivia provides one of the good examples Tanzania can learn from, whereby unfair distribution of revenues from natural gas has caused intensive economic, social and political conflicts (Harford, 2012). Harford notes that the profits gained from the export of natural gas are only benefiting a few Bolivians, thus causing dismay for the majority. Intrastate tensions have also burgeoned and succeeded to divide Bolivia between eastern and western provinces with each side scrambling for a profitable share of natural gas exports (Harford, 2012).

3.1.5 Establishing Sovereign Wealth Funds

Sovereign wealth funds have increasingly gained prominence in the natural resource management approaches across the world (see Appendix I). Cappelen and Urheim (2012) define sovereign wealth funds as entities that can manage the national savings for the purposes of investment. They are typically state-owned investment funds, investing in real and financial assets such as stocks, bonds, real estate, precious metals, or in alternative investments such as private equity funds. Many of the most important sovereign-wealth funds - such as the Norwegian Government Pension Fund – Global, Saudi Arabia's SAMA Foreign Holdings, and UAE-Abu Dhabi's Abu Dhabi Investment Authority - originate from oil revenues and their aim is to guarantee that future generations also benefit from the present large oil revenues. In so doing, these funds promote intergenerational justice by factoring in the revenues share of future generations from current natural resource earnings. This paper makes a special call to the Tanzanian Government to introduce a national sovereign wealth fund in the natural gas subsector to enable the future generations to accrue deserving benefits. This call is backed up by the authors' belief that current natural resource endowments, including natural gas, are borrowed from future generations and should, therefore, be paid back to them with due proactiveness and diligence through strategic high savings. The high savings of today from natural gas proceeds will benefit future generations because they imply less consumption by the current generation and more investments for the coming generations. Sovereign wealth funds, as vindicated by the case of Saudi Arabia, also play a key role in diversifying revenue streams and economies with the overall consequences of expanding employment opportunities and circumventing the Dutch disease.

3.1.6 Moderate pace in extraction of resources

Oil and gas, like other unrenewable natural resources, are exhaustible and their utilization ought to balance the needs of the current generation and the future generation. In that regard, the moderate pace of oil and gas extraction, and indeed utilization of all natural resources, is crucial for the country to allow itself learn from past mistakes. For example, Norway breakthrough in the use of oil and gas resources in promoting qualitative development of the country came with adoption of participatory democracy in policy making processes. The far reaching results enforced by the white paper No.25 on "The role of petroleum activities in Norwegian Society" in 1974. The white paper underlined the role of elected bodies to control and oversee all aspects of rules of the game in the oil industry in ensuring that oil wealth is used for qualitative betterment of living standards of the people (Ryggvik, 2010, p.34). The white paper states that: *Wishing for a long-term perspective in the exploitation of resources, and after a comprehensive evaluation of its social aspects, the Government has concluded that Norway should take a moderate pace in the extraction of petroleum resources* (Ryggvik, 2010, p.34). The paper underlines the importance of keeping moderate pace in the extraction of petroleum resources. Majority of Norwegians agreed on the moderate pace (Ryggvik, 2010). The moderate pace of oil extraction is crucial for the country to allow itself learn from past mistakes. Indeed, it enables the country to adjust its policies in ensuring that oil and gas resources are extracted in an invulnerable way. It is reasonable that Tanzania adopts a moderate pace in regard to handling of its oil and gas as well as other extractive resources.

3.1.7 Proactive management of health and environmental impacts

A report by a Canadian Environmental Commissioner namely Scott Vaughan notes that resource development does not seem to keep pace with environmental protection (Paris, 2013). The truth of this statement is realized in the fact that the extraction of natural gas in many countries around the world has brought with it severe environmental and health drawbacks that sometimes outweigh the anticipated, usually much-glorified, socio-economic gains. Harford (2012) observes that people living close to fracking[1] sites usually suffer from serious health problems caused by the emission of toxic chemicals (e.g., benzene/carcinogen, toluene and ethyl benzene) also found in fracking water. Emitted toxic chemicals contaminate air and water and lead to health and environmental problems. The typical health problems include headaches, loss of coordination, and damage to liver and kidneys. The fact remains that fracking continues to rule natural gas extractive operations, thus making it a continuous threat to the health of human beings and animals as well as the wellbeing of the environment and ecosystems at large – all at the expense of wealth. Suzuki (2013) cautions that "with fracking's gigantic appetite for water – water permanently removed from the ecosystem – what's at stake may not just be about our supply of natural gas but the one resource none of us can live without: fresh water" (n.p).

Meanwhile, although environmental advocacy is very powerful in the U.S., Harford (2012) notes that the oil and natural gas industry continues to play a significant role in destroying the ecosystems. Natural gas extraction in the U.S. is cited for polluting water and air, as well as contaminating livestock, wildlife and agricultural products in areas where fracking

1 *Fracking or hydraulic fracturing is a process or technology used to extract natural gas, involving the injection of highly pressurized water, sand and chemicals to break apart underground rock formations and free trapped shale gas and oil.*

takes place, thereby posing health threats to humans and other creatures. For example, livestock consume toxins deposited on water and grass thus contaminating the food chain by transferring the toxins (absorbed in livestock's muscle tissue) to humans. A study in Garfield County (Colorado) in a close proximity to drilling waste pits by Cornell University also found that a bull went sterile, a herd of beef cows and pigs stopped going into heat, and a herd of sheep had stillbirths (Harford, 2012). Cornell University observed the same problems in five other states in communities close to natural gas fracking sites (Harford, 2012).

It is unarguable that Tanzania must be incredibly cautious of the potential health and environmental impacts caused by the technology used to explore and extract natural gas. Specific policies, laws and regulations, both national and area-specific, must be enacted to warrant a smooth transition to and through the natural gas economy. If allowed to take place at the expense of the ecosystem, the extraction of natural gas will lead to not only adverse health and environmental impacts but also the consequential impact on economic diversification and, by and large, constrained sustainable development. The costs of extracting natural gas in the absence of solid and adequately enforced environmental policies, laws and regulations will gravely and most regrettably outweigh whatever social and economic benefits that will be garnered.

3.1.8 Managing Potential Land Use Conflicts

It is common for natural gas operations to convert other land uses (such as agriculture, forestry and fishing) to natural gas exploration and extraction sites. ACBF (2013) points out that international investments may disregard indigenous land claims and occupants. Therefore, if undertaken in an ad hoc manner, this creates land use conflicts within communities and leads to antagonistic relationships and even civil wars between/within communities. In fact, in addition to armed conflicts and their repercussions, poor resource governance across Africa affects disputes over land, water, pollution, and ownership of extractable resources and parts of related commodity chains (ACBF, 2013). Typically, such conflicts tend to goad discontent against the Government, natural gas extraction companies and even banks[2] providing funding to these companies. Tanzania is a typical agrarian society as pronounced in its peoples' reliance on farming, livestock keeping and fishing activities. Moreover, forestry activities are also dominant in many parts of the country, with tourism leading the service industry. All these activities take place on land, which is also required for natural gas exploration and extraction operations. The Government needs to plan ahead of time on how to manage potential contradictions in land use between the natural gas subsector and other sectors of the economy to ensure that the former does not replace the latter in a destructive manner but rather have them complement each other. In addition to avoiding land use conflicts, this will constitute a momentous step towards ensuring sustainable economic diversification.

3.1.9. Managing potential socio-economic changes

The discovery of a vast natural gas potential shades a promising light to the country's aspiration of catapulting itself from one of the poorest in the world to becoming a middle income nation by 2025. Envisaged to replace fossil fuel in electricity generation by end of

2 *For example, the Rainforest Action Network, an INGO based in San Francisco, ran an intense campaign against Citibank from 2000 to 2004, naming it The Most Destructive Bank in the World, which forced the bank to withdraw funds for Camisea Project [that was being implemented in Peru] (Vences, 2006: p. 14).*

2014, natural gas will play a pivotal role in cutting down overall production costs, reducing inflation and stabilizing the shilling against major world currencies. Supply of electricity to small towns and rural areas will also play a critical role in unlocking their staggering economic development potentials. However, MEM (2012) acknowledges that the natural gas industry in Tanzania is facing a number of challenges, some of which include natural gas revenue management, natural gas infrastructure, development of domestic market for natural gas, as well as health, safety and environmental concerns.

Natural gas development and extraction lead to population increases in related communities because of short- and long-term labour migration. According to Lloyd (2012), these changes in population have implications on the provision of services (particularly housing, schools, healthcare and security), labour force availability and skills, and local infrastructure (water, sewer, roads, telecommunication, etc.). As Lloyd adds, the development and extraction of natural gas is also expected to lead to an inflow of income that will generate many new jobs and increase the real disposable income particularly for those employed by the industry and those in spin-off industries and activities. Eventually, this leads to problems of inflation and increased cost of living. Therefore, deliberate plans and strategies need to be put in place to cope with these changes and turn them into utilizable opportunities rather allowing them to become surprising shocks and wasted opportunities. In fact, as Neureiter (2012) observes, natural gas development in Tanzania, especially at the exploration stage, poses alarming potential impacts on other sectors like agriculture, fishing and tourism. Therefore, the challenge to the Government and other stakeholders is to translate this opportunity into a factor of stability as opposed to the seemingly-traditional national, regional and international conflicts and imbalances that are entangled in oil and natural gas projects.

3.1.10 Promoting inclusiveness of Tanzanians in the subsector

It is important for Tanzania to examine the extent to which the natural gas sub-sector can actually be socio-economically inclusive to warrant its success and sustainability. The Government should ensure that participation of Tanzanians in the subsector is a cross-cutting policy issue, and it should consider it one of its paramount indicators of success in serving its people. Integral to this process is the identification and strategic engagement of stakeholders in the entire natural gas value chain, including clarifying the roles and expectations of each stakeholder group. The point of departure should be for Tanzania to come up with a tailored national skills development strategy that, among others, will map out all required skills, prevailing gaps, resources required to bridge the gaps, and how these resources can be found and effectively utilized. Majority of the Tanzanian youth can benefit by participating in the downstream activities, whereby they can be trained to carry out gas distribution and marketing activities. As a matter of fact, the Government is already doing a commendable job to bring the youth up to speed with available employment opportunities in the industry. Through the Vocational Education and Training Authority (VETA), the Government recently launched a project for Enhancing Employability through Vocational Training (EEVT) in Mtwara (VETA, 2013).

The project aims at improving employability of the Mtwara and Lindi populations and Tanzanians at large in the subsector. In the process, VETA will undertake training for three years to produce/empower artisanal technicians to work in the subsector. VETA is implementing the project in partnership with British Gas and Volunteer Service Organization.

However, being a relatively new industry, incorporation of the youth in the subsector will take place steadily, hence the importance of raising their awareness in time in order to manage their urgent expectations for employment opportunities in the subsector. It is also important for the Government to favourably consider Tanzanians in managing and operating natural gas wells when it begins to issue concession agreements in the subsector. Where Tanzanian businessmen fall short, be it in terms of financial capital or know-how, the Government should find ways to assist and enable them to partake in related undertakings. Tanzanians are also eager to see how natural gas will transform their lives by providing them with access to electricity to accelerate their involvement in economic activities as well as improve their lives (e.g., saving time to collect firewood and fetch water, being able to watch TV in their homes or neighbourhoods, freezing food for future consumption, etc.). Access to electricity and gas will also bring about trickle down effects, such as cutting down rates of deforestation and reducing family time apart.

3.1.11 Consider baseline studies

Being a relatively new entrant in the natural gas industry, it is important for Tanzania to conduct area-specific studies so as to generate the necessary information about how this development process is unfolding and the specific positive and negative socio-economic, geo-political and environmental impacts that are inherent in it. This information will not only inform the policy and planning processes but also form a basis for the monitoring and evaluation of the impacts and dynamics associated with the industry over time. An in-depth holistic research to map out/document the prevailing socio-economic, geo-political and environmental statuses of the communities within which natural gas operations are taking place - right at the birth of such operations - is critical for the gathering of benchmark data to be used for gauging progress of the industry over time. Neureiter (2012), for one, suggests that socio-economic baseline studies should be carried out to assess the current situation and, over time, the positive and negative impacts in all communities involved, including designing risk mitigation measures to address the potential negative impacts of natural gas development and extraction projects.

The same argument can also be extended to the importance of geo-political and environmental baseline surveys. The importance of a baseline research is timely and rational now in the face of the fact that current research attention in Tanzania is being drawn to geology and engineering components while ignoring the complex social impacts of exploration, development and extraction (Mutch, 2012). The information generated will play a key role in informing the agenda setting and policy formulation processes. By facilitating periodical evaluations, the baseline information will inform necessary adjustments towards better performance on the side of all the stakeholders involved under the oversight of the Government. In this case, the baseline data will be the basis for the Government's key role of developing and updating the natural gas policy to continuously guide decisions and achieve rational outcomes.

4.0 CONCLUSION

Discoveries of natural gas in Tanzania can be resembled to a new born in a family. Nonetheless, as it is commonly known, getting a baby is only one achievement that can make the parents happy and proud. The other equally important achievement is that of ensuring that a correct mix of behavioral and attitudinal traits is inculcated in the rapporteur of values that define the child in all stages of growth. Tanzania has largely accomplished the first achievement, that of knowing for sure that natural gas is not only available within its borders/reach but also abundantly so. Now, as this paper rationalizes, the 'grooming' part of the sub-sector is what needs to be taken into consideration with a deserving weight and prudence. Since past experiences (successes and failures) play a substantial role in shaping and re-shaping future actions/interventions, Tanzania has a lot to learn from her own experiences with developments in other sectors to achieve a smooth and sustainable operation of its booming natural gas industry. Markedly, Tanzania can draw really important lessons from the industry itself owing to the recent mayhem and concerns in Mtwara region, as well as from other countries – developed and developing – that have stumbled upon an array of socio-economic, geo-political and environmental experiences. Ample evidence of what really transpires within the industry provides Tanzania with a very resourceful point of take-off in 'grooming' the natural gas sub-sector. Tanzania can, in fact, set a very classic example to other countries in Africa and the world at large in implementing best management practices relative to the natural gas value chain while, at the same time, setting standards to be emulated by other economic sectors within the country.

This paper poses as a caveat to the Government and other stakeholders in the sub-sector to approach the operationalization of the industry within the framework of well-defined plans and strategies that are practically people-centered and proactively sustainable. Now is the time to not only make past mistakes a history but also take pride in achieved successes by adjusting to best management practices that are built on the platform of stable state participation, unwavering transparency, improved negotiating powers, and fair distribution of natural resource revenues. Other key practices include establishment of sovereign wealth funds, moderate pace in extraction of resources, managing health and environmental impacts proactively, managing potential land use conflicts, managing potential socio-economic changes, and promoting inclusiveness in the subsector. Baseline studies are also important to map out the point of departure of the natural gas economy for future evaluations of its positive and negative contributions to sustainable development. The proposed best management practices for policy consideration are perceived to be the necessary ingredients of what constitutes the remedy for state capture in the subsector; with the ultimate goal of fostering sustainable development. The Tanzanian natural gas sub-sector can make a significant contribution to the development of the country and improved performance of other economic sectors. At the same time, it can produce invaluable lessons for other countries to improve their performance in the management of natural gas and other natural resources. It is critical to ensure that the extraction of natural gas must provide a momentous contribution to, among others, human growth and development, provision of employment opportunities especially to the youth, income availability for economic growth

and prosperity, and, ultimately, poverty reduction in rural and urban areas.

If the natural gas, as well as other natural resources, are properly managed, harnessed and taxed, no doubt the country would become self-reliant in financing its recurrent and development expenditures. The key management issues presented in this paper, though not exhaustive, are crucially important in paving the way towards sufficient investment in human capital, infrastructures and other development pillars in the country with the ultimate goal of relieving rural and urban populations of their excruciating poverty rates – for the present and future generations.

APPENDIX I: SOVEREIGN WEALTH FUND RANKINGS

Largest Sovereign Wealth Funds by Assets Under Management

Country	Sovereign Wealth Fund Name	Assets $Billion	Inception	Origin	Linaburg-Maduell Transparency Index
Norway	Government Pension Fund – Global	$737.2	1990	Oil	10
Saudi Arabia	SAMA Foreign Holdings	$675.9	n/a	Oil	4
UAE – Abu Dhabi	Abu Dhabi Investment Authority	$627	1976	Oil	5
China	China Investment Corporation	$575.2	2007	Non-Commodity	7
China	SAFE Investment Company	$567.9**	1997	Non-Commodity	4
Kuwait	Kuwait Investment Authority	$386	1953	Oil	6
China – Hong Kong	Hong Kong Monetary Authority Investment Portfolio	$326.7	1993	Non-Commodity	8
Singapore	Government of Singapore Investment Corporation	$285	1981	Non-Commodity	6
Russia	National Welfare Fund	$175.5*	2008	Oil	5
Singapore	Temasek Holdings	$173.3	1974	Non-Commodity	10
China	National Social Security Fund	$160.6	2000	Non-Commodity	5
Qatar	Qatar Investment Authority	$115	2005	Oil	5
Australia	Australian Future Fund	$88.7	2006	Non-Commodity	10
Algeria	Revenue Regulation Fund	$77.2	2000	Oil & Gas	1
UAE – Dubai	Investment Corporation of Dubai	$70	2006	Oil	4
Kazakhstan	Kazakhstan National Fund	$68.9	2000	Oil	8
UAE – Abu Dhabi	International Petroleum Investment Company	$65.3	1984	Oil	9

Libya	Libyan Investment Authority	$65	2006	Oil	1
South Korea	Korea Investment Corporation	$56.6	2005	Non-Commodity	9
UAE – Abu Dhabi	Mubadala Development Company	$55.5	2002	Oil	10
Iran	National Development Fund of Iran	$54	2011	Oil & Gas	5
US – Alaska	Alaska Permanent Fund	$46.8	1976	Oil	10
Brunei	Brunei Investment Agency	$40	1983	Oil	1
Malaysia	Khazanah National	$39.1	1993	Non-Commodity	5
Azerbaijan	State Oil Fund	$34.1	1999	Oil	10
France	Strategic Investment Fund	$25.5	2008	Non-Commodity	9
US – Texas	Texas Permanent School Fund	$25.5	1854	Oil & Other	9
Kazakhstan	National Investment Corporation	$20	2012	Oil	n/a
Ireland	National Pensions Reserve Fund	$19.4	2001	Non-Commodity	10
New Zealand	New Zealand Superannuation Fund	$17.8	2003	Non-Commodity	10
US – New Mexico	New Mexico State Investment Council	$17.3	1958	Oil & Gas	9
Canada	Alberta's Heritage Fund	$16.4	1976	Oil	9
Chile	Social and Economic Stabilization Fund	$15.2	2007	Copper	10
US – Texas	Permanent University Fund	$14.4	1876	Oil & Gas	n/a
East Timor	Timor-Leste Petroleum Fund	$13.6	2005	Oil & Gas	8
Russia	Russian Direct Investment Fund	$13	2011	Non-Commodity	n/a
Oman	State General Reserve Fund	$8.2	1980	Oil & Gas	4
Bahrain	Mumtalakat Holding Company	$7.1	2006	Non-Commodity	9
Peru	Fiscal Stabilization Fund	$7.1	1999	Non-Commodity	n/a
Chile	Pension Reserve Fund	$7.0	2006	Copper	10

Botswana	Pula Fund	$6.9	1994	Diamonds & Minerals	6
Mexico	Oil Revenues Stabilization Fund of Mexico	$6.0	2000	Oil	n/a
Oman	Oman Investment Fund	$6.0	2006	Oil	n/a
US – Wyoming	Permanent Wyoming Mineral Trust Fund	$5.6	1974	Minerals	9
Brazil	Sovereign Fund of Brazil	$5.3	2008	Non-Commodity	9
Saudi Arabia	Public Investment Fund	$5.3	2008	Oil	4
China	China-Africa Development Fund	$5.0	2007	Non-Commodity	4
Angola	Fundo Soberano de Angola	$5.0	2012	Oil	n/a
Trinidad & Tobago	Heritage and Stabilization Fund	$5.0	2000	Oil	8
US – Alabama	Alabama Trust Fund	$2.5	1985	Oil & Gas	n/a
Italy	Italian Strategic Fund	$1.4	2011	Non-Commodity	n/a
US – North Dakota	North Dakota Legacy Fund	$1.3	2011	Oil & Gas	n/a
UAE – Ras Al Khaimah	RAK Investment Authority	$1.2	2005	Oil	3
US – Louisiana	Louisiana Education Quality Trust Fund	$1.1	1986	Oil & Gas	n/a
Nigeria	Nigerian Sovereign Investment Authority	$1.0	2011	Oil	n/a
Palestine	Palestine Investment Fund	$0.8	2003	Non-Commodity	n/a
Venezuela	FEM	$0.8	1998	Oil	1
Kiribati	Revenue Equalization Reserve Fund	$0.6	1956	Phosphates	1
Vietnam	State Capital Investment Corporation	$0.5	2006	Non-Commodity	4
Gabon	Gabon Sovereign Wealth Fund	$0.4	1998	Oil	n/a
Indonesia	Government Investment Unit	$0.3	2006	Non-Commodity	n/a
Mauritania	National Fund for Hydrocarbon Reserves	$0.3	2006	Oil & Gas	1
Australia	Western Australian Future Fund	$0.3	2012	Minerals	n/a

Panama	Fondo de Ahorro de Panamá	$0.3	2012	Non-Commodity	n/a
Mongolia	Fiscal Stability Fund	$0.3	2011	Minerals	n/a
Equatorial Guinea	Fund for Future Generations	$0.08	2002	Oil	n/a
Ghana	Ghana Petroleum Funds	$0.07	2011	Oil	n/a
UAE – Federal	Emirates Investment Authority	n/a	2007	Oil	3
UAE – Abu Dhabi	Abu Dhabi Investment Council	n/a	2007	Oil	n/a
Papua New Guinea	Papua New Guinea Sovereign Wealth Fund	n/a	2011	Gas	n/a
	Total Oil & Gas Related	**$3,444.9**			
	Total Other	**$2,412.5**			
	TOTAL	**$5,857.4**			

**This includes the oil stabilization fund of Russia. **This number is a best guess estimation.*
****All figures quoted are from official sources, or, where the institutions concerned do not issue statistics of their assets, from other publicly available sources. Some of these figures are best estimates as market values change day to day. Total figures are rounded to the nearest tenth.*

Information above was updated in September 2013.

Source: SWF Institute (2013)

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