

Technology Transfer Policies in Fostering Good Governance: A Case of Oil in South Sudan

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ABSTRACT

Technology transfer and its role in governance and economic development in resource- rich Africa is a keen subject to researchers and policymakers. African oil- producing states face a technological disadvantage as they heavily rely on foreign companies' expertise. These technologies are offered by foreign companies whose aim is to make profits. Technology transfer policies, therefore, would play a very crucial role in determining how African States can acquire technology that will enable them to achieve sustainable economic progress in the oil sector. However, implementing such policies has proven challenging to most African states, leaving them vulnerable to exploitation by foreign oil companies. While acknowledging that poor governance lies at the core of underdevelopment and political instability, this paper seeks to discuss the extent to which the formulation, implementation, and strict adherence to technology transfer policies can aid in fostering good governance in the oil sector of South Sudan. This is based on the foundational basis that technology integration is largely associated with transparency, accountability, active citizen participation, efficiency and effectiveness in governance, environmental protection and conservation, and strict adherence to human rights among others. This study, therefore, infers that favourable technology transfer policies remain critical in addressing the governance crisis or deficits that South Sudan faces, with a specific focus on the oil sector.

Keywords: technology transfer, good governance, Technology capacity, sustainability, political stability, rule of law.

INTRODUCTION

Technology transfer and its role in governance and economic development in resource- rich Africa is a keen subject to researchers and policymakers since society development is embedded on it. Africa possesses abundant natural resources such as oil, gold and diamond which could play a pivotal role in the economic development of the continent. However, availability of these resources has not automatically boosted the economy of most Africa resource-rich states especially those with oil. Instead, oil has often been associated with conflict, earning it the label of "resource curse" (Chol, 2016). One major challenge has been that of governance, more so on the lack of effective policies that promote good governance and sustainability. Despite this being the case, Africa, though rich in resources, is deficient in the much-needed technology required for it to leverage its abundant natural resource wealth.

To mitigate this glaring shortfall, oil-rich states in the continent can pursue effective technology transfer policies that will dictate how they negotiate for better terms with international companies. This can be done through viable bilateral technology transfers with foreign companies such as MNCs to fast-track natural resource use for economic development. Technology transfer entails the transfer of know-how from foreign companies/ Multinational cooperation to states and/or local companies towards empowering the recipients (host country) to kick-start manufacturing and industrialization (Bozeman Technology Transfer and Public Policy, 2000). This is done to create sustainability and ownership on the process of resource governance.

Whereas this is ideal, most African states have failed in negotiating for technology transfer between the

technology-intensive foreign companies and the technology-deficient oil-rich African countries (Bozeman Technology Transfer and Public Policy, 2000) this has continued to position African states at a point of disadvantage globally when it comes to achieving maximum benefit from their resource wealth. The failure of African governments to effectively partner with international actors to transfer technology that will activate economic growth can purely be attributed to poor governance occasioned by poor leadership that has taken lightly the importance of having good policies. Consequently, this has made the process of technology transfer become a tool of leverage of technological imperialism by foreign companies hence enhancing underdevelopment and dependency in most oil-rich states in the continent (Bade, 1988). As Edoho notes, most foreign companies use their technological know-how as a strategy to gain dominance in resource-rich countries which is contrary to the spirit of good governance (Edoho, 1990). Even where the rules of technology transfer are well stipulated, most international companies are unwilling to transfer the intangible aspects of technology such as patents and trade secrets to host countries (Nonaka, 1994). This affects the economic growth of most resource-rich countries and enhances dependency on Western technology.

Technology transfer as an important aspect of oil governance should therefore create opportunities for different actors to share perspectives of good governance practices towards developing awareness of evolving threats and enhancing best practices. It should take into account capacity building and deal with threats enhanced by the manipulation of economic relationships (Nonaka, 1994) hence creating invaluable opportunities.

In addition technology transfer creates chances to build and share awareness of evolving threats, to share perspectives and compare notes on “best practices” such as reduction of emission, water conservation, monitoring and maintenance, construction and reclamation and community development (Utah Department of Environment Quality, 2023). Consequently, this helps in responding to technology-transfer challenges, towards developing and improving cooperative synergies, explore mutually supportive capacity-building enterprises, and to form closer partnerships in mitigating the threats presented by authoritarian influence and manipulation of economic relationships.

This paper, therefore, seeks to evaluate how oil-rich states such as South Sudan are effectively implementing technology transfer policies that foster good governance.

LITERATURE REVIEW

A. Rationale for Technology Transfer in The oil sector

The oil sector is characterized by a high degree of technological complexity, and technology transfer is critical for improving the management of this sector. The need for technology transfer therefore, is becoming increasingly important due to the foreseen benefits it provides to oil-producing states especially those that are technologically not advanced yet have resources.

Technology transfer being that process where knowledge, skills, innovation, technology, and method are shared among governments, firms and research agencies, it becomes a key aspect of oil governance (Areish, n.d.) as it brings different stakeholders together towards ensuring that there is accessibility to scientific and technological development in the oil sector (Chen et al., 2016). This allows users to domesticate, develop and exploit this knowledge towards creating and developing their oil sector.

For this reason, technology transfer aims at building the capacity of oil states towards innovation and sustainability (Chen et al., 2016). In addition, it is key in fostering economic development towards sustainability, efficiency, and competitiveness in the oil sector (Vonortas, 1997). This increases capacity of organizations and individual to better govern resources (Park & Singh, 2010). Finally, Technology transfer

is key towards building the local workforce who are technologically disadvantaged and allows them to learn how to operate the industry towards enhancing local innovation.

B. Technology Transfer Policies and Good Governance in the oil sector

Technology transfer policies refer to the strategies, programs, and regulations aimed at facilitating the transfer of knowledge and technology in the oil sector. Good governance in the oil sector, refers to the proper management of oil in a way that promotes sustainable development and equitable distribution of benefits.

Effective technology transfer policies such as effective legal and regulatory frame works, can facilitate the transfer of technology and knowledge towards fostering good governance in the oil sector by improving the management of oil and promoting local ownership (Park & Singh, 2010).

For instance, policies that promote the transfer of technology and knowledge from foreign oil companies to domestic firms can enhance the capacity of domestic firms to manage these resources, which can lead to improved governance and better outcomes such as transparency and environmental sustainability, resource sharing and sustainable economy (UNCTAD, 2013). Additionally, policies that promote transparency and accountability can reduce the risk associated with the transfer of technology and knowledge, which can prevent corruption and promote good governance (Park & Singh, 2010).

C. The challenge of technology transfer

The challenge of technology transfer has always been what multinational corporations transfer. Most multinationals transfer technology that is not able to empower nations to successfully run their industries on their own hence creating dependency (Park & Singh, 2010). The question then should be what technology is key and appropriate for specific countries to take up their industries. Understanding the specific technology needed to empower nations towards innovation becomes key in determining what governments of resource-rich states should negotiate for.

The second aspect of technology transfer to be considered is the relevance of the technology transferred. While transferring technology, the context of each country matters. In most cases, multinationals have failed in the area of relevance by not understanding the context and the needs of specific nations (Mohamed et al., 2012). When this is ignored, technology transfer lacks acceptability and does not empower nations. In this case, there is a high chance of creating dependence and not encouraging innovation towards development.

As noted above, technology transfer should empower nations towards successfully taking up specific mandates and enhance innovation. For such to take place, technology transfer should be human resource centred. This is where the target should not only be to concentrate on machine installation but focus also on the transfer of knowledge, skills and capability to people. The knowledge from technology transfer could either be static or dynamic. These two aspects are key to passing technology. Static technology is the knowledge that allows carrying out certain routines for effective innovation. This could include aspects such as communication skills, and bookkeeping. Dynamic technology knowledge would involve scientific principles that are key in stimulating innovation and invention (Mohamed et al., 2012).

RESEARCH FINDINGS

D. The Paradox of Oil Governance in South Sudan

South Sudan is one of the most resource-endowed economies in the world. The country prides itself in the endowment of oil reserves in different regions including the Upper Nile Regions and the Greater Bar El

Ghazel. Further, the East African youngest nation that gained political independence on 9th July 2011 after its successful secession from Sudan also possesses other resources including gold, copper, and forests among other valuable resources. As a result of its resource potential and its geopolitics, South Sudan enjoys favourable leverage in international politics and remains a desirable diplomatic destination for global powers including China, Britain, and the United States of America which are largely interested in its oil reserves.

Upon attaining independence, it was widely hoped that South Sudan would utilize its vast resources including oil wealth to transform the economy and uplift the livelihood of its citizens. The citizens projected that the country would make good use of its geopolitics to tap international support and assistance and the oil revenues to finance viable projects that would expand the economy including infrastructural networks and create viable opportunities for employment creation hence reducing poverty influx. This general expectation has become elusive. This is informed by the fact that despite enormous oil and gas production with estimated oil revenue of \$19.5 billion in the period between 2006 -2014, South Sudan is yet to realize any considerable meaningful level of political stability and development.

The people of South Sudan continue to suffer from state failure orchestrated by their leaders who have failed in their constitutional mandate of forging a long-lasting foundation of peace for the youngest East African nation. South Sudan plunged into a catastrophic civil war in 2013 that ranged for six years. The war plunged the country into a serious economic crisis and claimed the lives of more than 400,000 South Sudanese. The internal power wrangles have broken the country's financial revenues. According to World Bank (2021) report, an estimated 82% of South Sudanese endure absolute poverty and live below \$1.90 daily. The report further highlights that over 80% of the 12 million South Sudanese live in rural areas and only 10% have access to basic sanitation (World Bank, 2021).

The report further indicates that because of the propensity of wars and conflicts, the government of South Sudan only allocates 2.6% of its budget to health care, a situation that has worsened the health infrastructure of South Sudan. Glaringly, the report pointed out that an estimated 60% of the population faces serious food insecurity and needs urgent humanitarian intervention. Reports further highlight that South Sudan is the third least educated country globally with an illiteracy level projected at over 70% (World Bank, 2021). From these report findings, it is necessary to highlight that despite the increasing oil demand, and increase in oil production and revenues, development indicators including health systems, education levels, and manufacturing sectors among others remain quite low.

On a foundational basis that oil accounts for over 85% of South Sudan's revenue and 94% of exports, Chol (2016), findings highlight oil as being the focal point of South Sudan's fortunes and misfortunes. According to Chol the protracted conflicts in South Sudan are not entirely a product of power wrangles but also caused by mistrust and discontentment with the management of South Sudan's gains from the oil reserves (Chol, 2016). Preliminary study findings indicate that the political instability and economic vulnerabilities of South Sudan are predominantly associated with the lack of accountability and transparency in the management of oil revenues. The International Crisis Group (2021) opines that oil cartels have dominated the oil sector, barring efforts for oil revenue scrutiny and favoring corruption and misappropriation of oil resources (Chol, 2016). The political players have continuously been at crossroads as they battle to enjoy a firm grip on the country's oil revenues.

The failure of the reigning regime to fairly share the oil revenues and engage the local communities in the oil extraction processes continues to amplify the ethnic and political animosities in South Sudan hence breeding conflicts. The study by Chol (2016) highlights that the management of the oil processes in South Sudan contravenes the provisions of the Petroleum Act (2012) and the Petroleum Revenue Management Act (2013).

While highlighting that the economic status of South Sudan and its vulnerabilities is largely orchestrated by the dominance of ruling elites in the oil sector, Chol notes that corruption thrives in the country with the president recently terming it a national cancer (Chol, 2016). He alleges that as a result of this and the fact that the positive gains of the project rarely trickle down to the locals, the country's purchasing power has declined and the country's South Sudanese Pound continues to weaken against the dollar hence putting the country at risk of hyperinflation (Chol, 2016).

Against this background, it is evident poor governance occasioned by poor leadership characteristic by corruption, misuse of oil revenue and lack of adherence to the law remain among the pertinent causes of conflicts, violence, the rise of insurgencies, and rent-seeking resistance in the republic of South Sudan.

E. Technology Transfer Policies in the oil sector of South Sudan

Technology is an important factor in ensuring the success of the oil sector and positioning oil states to be globally competitive. Technology transfer provides an avenue where technology can be accessed and acquired. The role of good governance becomes key, especially in policy formulation and implementation. Policies ensure that there are guidelines set towards attaining economic benefit from oil resources. In the oil legal framework of South Sudan especially in the petroleum act of 2012, some clauses speak to the importance of technology transfer in South Sudan.

Chapter 15(66) of the petroleum act for instance stipulates that,

“To enable service and supply entities indigenous to the Republic to compete with their international counterparts, a licensee or contractor shall encourage and facilitate the transfer of skills, knowledge, competence, and know-how to the Government by the formation of joint ventures, partnering and the development of licensing agreements with service and supply entities indigenous to the Republic. To make this transfer effective, the licensee or contractor shall make its business understandable and accessible to the service and supply entities indigenous to the Republic in relevant matters, including language” (South Sudan Petroleum Act, 2012).

The clause above under the petroleum act highlights the importance of technology transfer by international counterparts. It calls for international actors involved in the oil sector to facilitate the transfer of skills, knowledge, competence, and know-how by partnering with the people. It therefore, calls for responsibility on the part of international actors involved to make their activities accessible to the local people. Notably, the clause calls for technology transfer to enforce both “Know-how” and “show-how” through a working relationship between the locals and international companies. The transfer of skills and competence is key in “show how”, this not only calls for knowledge training but the practical aspect of doing. The act calls for joint ventures as a strategy to transfer technology.

Joint ventures, as equated to other mechanisms of technology transfer, seem to be preferred by international companies as they help multinationals escape the risk of nationalization. In a joint venture, companies form a partnership that allows the parties to pursue an equal share of benefits. It is a great avenue for creating goodwill with the government of the host countries as it creates employment for the people. Through a joint venture, it is believed that there is a great benefit for different parties (South Sudan Petroleum Act, 2012).

Following the law, as indicated by the oil act 2012, the government of South Sudan has formed joint ventures with international oil companies such as greater pioneer operating company (GPOC), Dar Petroleum Operating Company (DPOC) and Sudd Petroleum Operating Company (SPOC) through the state-owned oil company Nile Petroleum Corporation (Nilepet) (Tiitmamer & Mayai, 2021). Despite legal provisions outlined to facilitate technology transfer in South Sudan, the challenge of implementing

technology transfer as highlighted by Tiitmamer is the measurability of technology being transferred.

This is auctioned by a lack of existence of quality data to give practical evidence of technology transferred (Tiitmamer & Mayai, 2021). While having policies is important, implementing the policies, while upholding transparency and accountability makes the difference. The lack of transparency in oil dealings of South Sudan, especially on how technology is being transferred is a clear sign of poor governance resultant from lack of policy implementation.

As supported by study field research, respondents in the oil sector of South Sudan while asked whether the international oil companies are keen to transfer technology to the local oil workers, 80 percent of respondents stated that there was minimal or no technology transfer to enable them become more effective in the oil sector. They added that, they desired to have hands on experience on technological aspects such as advanced seismic imaging techniques using 3D and 4D, advanced drilling rigs, supervisory control and data acquisition yet such is reserved for international workers who control the process.

Above sentiments were supported by a local worker who lamented that,

“We desire to get hands-on experience in the operation of machines used in the drilling process from international oil companies; however, we are even restricted to get into the control room where we could get an opportunity to get critical operation skills. We feel like there is a line drawn for us as to how far we can go to learning how we could operate the oil drilling process” (Tiitmamer & Mayai, 2021).

This shows that there is a lack of willingness to transfer technology and the government should ensure that international companies comply and indeed transfer technology, as stipulated in the legal provisions that there should be a clear plan published in a government gazette yearly giving detailed information on transfer of skills and knowledge transferred in a specific period. The other challenge that has contributed to poor technology transfer in the oil sector of South Sudan is a lack of specific mechanisms to enforce implementation of technology transfer in South Sudan (Tiitmamer & Mayai, 2021). Most international oil companies given their role to transfer oil technologies to the locals take advantage of this lacuna. The act gives a mandate to the oil companies to come up with a plan on how they will transfer technology yet does not give clear guidelines on how to enforce the process.

A lack of clear guidelines has negative impact on technology transfer as it led to suboptimal technology transfer, inconsistencies in the evaluation, implementation, and monitoring of transferred technologies, disputes that can hinder technology sharing especially on intellectual properties, limited efforts to develop local skills, capabilities, and knowledge, hence continued dependence on external expertise and consequently a lack of sustainable technology transfer. This has been evident in the oil sector of South Sudan. In addition, the government officials are compromised through corruption and are only interested in rent seeking from oil companies.

The Nile Petroleum Corporation (Nilepet) South Sudan's national oil company for instance, is meant to oversee petroleum operations in South in South Sudan; however, because of its limited technical expertise and financial resources, it is limited in its operations (Deng, 2022).

F. Technology Transfer Policies in the oil sector of South Sudan

Technologically advanced economies such as the United States of America, and Britain among others are defined by the dominance of good governance practices in the management of their valuable resources and their productive forces. This is informed by the fact that in such economies, locals have absolute skills, expertise, and knowledge of production.

Hence, the countries do not heavily rely on foreign companies for production, mining, and manufacturing services.

In most situations, these foreign companies may compromise local governance structures hence playing a disintegrative role in so far as building the local economy is concerned. For instance, as currently constituted, the Ministry of Petroleum and Mining of South Sudan only has a supervisory role in oil extraction, processing, and manufacturing. Given the lack of technological skills, capacities, expertise, and knowledge, several foreign-based firms enjoy absolute mining rights of South Sudan oil and this has made it quite complicated for the local population to gain the positive multiplier effects of their local natural resources (Deng, 2022).

To further exemplify the dominance of foreign firms in South Sudanese oil exploration and extraction, it is worth noting that Asian-based Greater Pioneer Operating Company and Dar Petroleum Operating Company enjoy great mining rights and concessions in South Sudan due to technological power they hold. Furthermore, other foreign firms including Malaysian-based Petronas Company Limited and Chinese-based Chinese National Petroleum Company, and Indian Oil and Natural Gas Company dominate the mining sector of South Sudan, with quite minimal local labor inclusion and development opportunities.

The Nile Petroleum Corporation (Nilepet) South Sudan's national oil company for instance, which is meant to oversee petroleum operations in South Sudan has limited technical expertise and financial resources, hence not fully able to conduct its operations (Deng, 2022) giving foreign based firms great freedom to pursue profits without consideration of the local content.

Consequently, foreign-based firms become not only extractive but exploitative too. These foreign companies' governance tendencies exacerbate the discontent of the local communities hence acting as a stimulant to South Sudan's based political instability and underdevelopment. Effective technology transfer policies empower and enhance the human capacity and capabilities of the local population hence limiting local reliance on extractive and exploitative foreign firms. Therefore, effective technology transfer policies improve the capacity of the locals, hence enhancing local industrialization and development of local firms and in the long run promoting the establishment of a locally controlled economy.

According to McFerson (2009), state effectiveness in meeting its public demands is usually measured using governance impact indicators, sometimes with emphasis on anti-corruption, transparency, and accountability measures. His study findings highlight that despite a gamut of initiatives aimed at reducing corruption and mismanagement of funds, lack of transparency and accountability remains pervasive in South Sudan. The prevalence of corruption exists even though local laws tend to discourage and forbid it. The oil sector for instance, is considered one of the most corrupt and a bloated sector in South Sudan largely influenced by the opaque nature in which political players, and stakeholders, in the military sector runs and manages the oil sector in South Sudan.

Chol (2016) summarizes the undemocratic tendencies that constitute the oil sector to include limited oversights on oil-related processes and expenditures hence facilitating corruption and embezzlement of funds, and lack of local participation in governance issues among others. For instance, according to study findings by Transparency International (2014), South Sudan was ranked number 171 out of 175 economies where high rates of corruption and mismanagement of revenues and other resources are entrenched.

Effective technology transfer policies present viable opportunities to align the management of the country's natural resources as defined by the existing international and local laws including the South Sudan Petroleum Act (2012) and Petroleum Revenue Management Act (2013) with local expectations. This is informed by the fact that through the integration of technology in the sector and expanding the human

capabilities of South Sudanese, the processes of scrutiny of oil revenues and expenditures shall be eased. According to Rosemary Williams instilling a sense of accountability, transparency, and local active engagements requires the integration of technology in the management of the country's financial resources (Rosemary Williams, 2015).

Embracing technology is therefore cardinal to eschewing corruption and mismanagement of funds, protracted conflicts, environmental degradation, and poor living standards. Technology platforms provide the necessary avenues for holding the current regime accountable for public expenditures. Through effective technology transfer policies, the government will be obliged to publicly publish all production and exploration sharing agreements as defined in the Petroleum Act of 2012. Secondly, by digitalizing the oil sector, all oil-related tenders and expenditures shall be carried out through publicly established online platforms to enhance openness, transparency, and accountability. Mining licenses should equally be made public.

As contained in the Petroleum Revenue Management Act, the government should upscale its financial auditing of all oil-based revenues and take punitive actions against those found culpable of engaging in corruption and mismanagement of funds. Further, the government must channel all oil revenues into one account and ensure that the allocated funds to the oil sector are published online.

It is important to note that by integrating technology into the oil sector, there will be ease in maintaining, keeping, and monitoring oil contract agreements, licenses, and authorizations for public reviews. Therefore, technology transfer policies are critical enablers for establishing oil revenue mechanisms aimed at enhancing good governance practices of transparency and accountability. The policies will play the important role of limiting kleptocratic practices in the oil sector hence increasing revenue generation.

It is also worth highlighting that the integration of technology in the oil sector plays an important role in harboring or nurturing the active participation of the South Sudanese in the activities and processes in the oil sector. From the current establishment, the foreign companies deny the locals their right to development, and this explains why despite increasing oil revenues and extraction in South Sudan, poverty levels remain pervasive hence augmenting the assertions of the oil curse in South Sudan.

Evidently, through technological human capacity building, the locals become endowed with the necessary skills and abilities to play an active role in oil exploration and extraction. Active participation in governance is one of the critical indicators of good governance. Technology transfer platforms provide avenues for public scrutiny and review of natural expenditures and revenues. The technology transfer policies, therefore, play a critical role in bridging the knowledge gap and innovation deficiencies that jeopardize the active participation of the locals in the management of the oil sector.

Environmental degradation or environmental terrorism remains a pertinent governance issue not only in South Sudan but also in other oil-producing economies. Study findings reveal that the foreign-based oil companies in South Sudan operate in strict contravention of the provisions of the Health Safety and Environmental System Regulations Act (2015) that obliged the government to carry out necessary Environmental Impact Assessments before opening any site for oil mining activities.

The law also requires the parties to ensure strict adherence to international standards of Environmental Conservation and management to save humanity. Chol (2016) qualitative study findings highlight that there exists a link between oil resources and environmental degradation in South Sudan by the oil companies. The study describes that oil exploration, development, and production remain a significant curse to communities living within the oil fields. This assertion corroborated the study findings by Karl (2023), that posited that localities, where oil is located, tend to suffer from lower-income and economic growth prospects,

greater dislocations, higher health, and environmental hazards, and higher levels of conflict.

The environmental dimensions in South Sudan are a significant cause of social dislocation. Loss of biodiversity, hazardous wastes, and depletion of the ozone layer are some of the environmental concerns that continue to endanger the health of the local populations in South Sudan. The prevalence of these environmental concerns in oil-producing areas including Blocks 1, 2 and 4 and Block 5A provides a clear manifestation of a lack of proper governance structure to manage environmental issues associated with oil exploration, processing, and development. Existing local laws including the Petroleum Act 2012 as stated in Article 48(1) stipulate that Petroleum activities should be conducted and managed in a manner that prevents wastage and enhances the safety and preservation of the environment.

The centre of this menace remains the integration of poor technological infrastructure in the processing, development, and entire management of the oil sector since most of the technologies that the foreign-based contracted firms integrate at the oil fields are obsolete, hence facilitating environmental degradation. In addition, the inadequate guidelines without proper assessment and oversight the use of technologies with high carbon emissions have polluted the environment harming local community and the ecosystem at large.

Following a report on environment pollution in South Sudan, the oil sector in South Sudan, has polluted the environment by contaminating the water and soil with toxic chemical and heavy metals leading to alarming birth effects and other health problems in communities residing near the oil mines (Aurelio, 2019).

The only way that the oil sector can enhance mitigate such environmental effect is by negotiating for advanced health, safety, and environmental technologies such as real-time monitoring of air, water quality, oil leak detection system and safety management systems technologies that monitor the compliance with environmental regulation.

In addition, effective technology transfer policies will enhance the active participation of locals in the management of their natural resources and play an integral role in ensuring that the technological infrastructure that is involved in oil exploration and development is upgraded and effective.

Consequently, this will instill a sense of efficiency and effectiveness in oil exploration and facilitate monitoring of oil exploration processes. Additionally, the integration of modern technologies such as digitalization of data to facilitate efficient data storage will play a significant role in rationalizing public payrolls, weeding out duplicate payments, and ghost workers in the oil sector as well.

Indeed effective technology transfer is dependent on good policies powered by good governance that seeks to create an environment that foster collaboration, knowledge exchange and hence technology transfer. With clear guidelines that promote transparency, accountability, and sustainability this could facilitate effective technology adoption and innovation.

G. Technology Transfer Policies in the oil sector of South Sudan

The role of Kleptocrats, constituted by both political power brokers and the militaries is considered one of the major bottlenecks to the formulation and implementation of technology transfer policies that foster good governance in the oil sector of South Sudan. These players, because of the active role they play in South Sudan's economy, have facilitated the establishment of opaque systems and weak oversight institutions that support their rent-seeking behaviors in so far as the management of oil returns is concerned.

The country's kleptocrats are yet to develop favorable political goodwill aimed at embracing transparency and accountability within the oil sector in South Sudan. For instance, they continue to frustrate every effort aimed at domesticating the locally established laws including the Petroleum Act of 2012 and the Petroleum

Revenue Management Act of 2013.

Secondly, the implementation of effective technology transfer policies has been frustrated by the lack of political goodwill among policymakers and actors. Corruption and mismanagement of funds remain one of the salient manifestations of South Sudan's resource curse. Pervasive corruption has manifested in different forms of reported scandals, unbudgeted withdrawals, inflated procurement contracts in the oil sector, and the prevalence of bribery among other forms of corruption have quickly aided in eroding South Sudan's solidarity towards development. The political players and the military elites with absolute control of the oil assets use it as leverage to assume power and maintain themselves in office, either through coercive means or legal means.

The study findings from South Sudan corroborate the earlier findings by Luong and Weinthal whose study of five oil-producing countries including Russia, Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan concluded that oil wealth leads to weak political institutions when the government has an active role in the oil sector (Luong & Weinthal, 2012). The study highlighted that the weak political institutions are a recipe for a lack of political goodwill by oil stakeholders to sanitize the environment. Through weak political institutions, corruption practices including rent-seeking behaviors become easier for government officials (Luong & Weinthal, 2012).

While acknowledging the fact that corruption contributes much to poor policy implementation posits that in oil-rich economies, political players harbor undemocratic tendencies by supporting and financing policies that produce personalized rents even in situations where the policies produce limited overall social welfare (Karl, 2007). In the context of South Sudan, the established kleptocratic regime has facilitated the fragmentation of communities and acted as an enabler for civil wars to create a conducive environment for usurping petroleum resources.

The government of South Sudan has equally not prioritized stabilizing the economy and embracing digitalization in the contemporary globalized and technology-oriented society. Instead of investing in building the human capacities of the citizens of South Sudan, most of the country's budget allocations have targeted the military sector. The government has been less responsive to addressing the social cleavages including fragmentation of communities, resentment, and discontent about the oil production, revenue, and development, exploitation of the locals by foreign-based firms as well as serious environmental terrorism orchestrated by the foreign-based oil construction firms.

As a result of the less funding, the department of Communication and Information Technology finds it quite complex to establish an upgraded technology infrastructure in the oil sector to enhance efficiency, effectiveness, and accountability in the management of the oil sector.

Addressing these challenges requires a collaborative effort between the government, oil companies, international partners, and relevant stakeholders. Implementing capacity-building programs, improving the investment climate, enhancing regulatory frameworks, and fostering partnerships for technology transfer can help overcome these obstacles and promote sustainable development in South Sudan's oil sector. Top of Form Bottom of Form

THEORETICAL FRAMEWORK

This paper employs institutional theory that highlights the role of institutions in shaping the technology transfer process. Douglass North, John Meyer, and Brian Rowan are some of the academics who have backed institutional theory transfer (North, 1990). The theory proposes that institutions, through the rules, norms, and cognitive frameworks they establish, play a significant role in shaping social behavior and outcomes. It focuses on the role of institutions such as government and international organizations in

shaping rules and norms that govern the transfer of technology which becomes key in either facilitating or hindering effective technology transfer (North, 1990). The theory argues that, for effective technology transfer, institutions should align with the goals and objectives of technology transfer process (North, 1990).

RESEARCH METHODOLOGY

The paper adopted the mixed-method research methodology which employed both qualitative and quantitative data. Primary data was drawn from administered questionnaires from relevant respondents, interviews and focused group discussions conducted with academicians, oil companies' government officials and community leaders. Secondary sources were drawn from books, journals, books, reports and published empirical reports.

CONCLUSION

Technology transfer is key in South Sudan and the government in place has failed in making sure that there are proper channels and enforcement mechanisms that facilitate the transfer of technology. A lack of accountability and enforcement gives room for multinational corporations to take transfer issues easily. A proper plan that facilitates and enhances the process is key.

Poor governance tendencies continue to thrive in South Sudan because of the dominant role that political players, military elites, and other kleptocrats play in so far as the country's economy is concerned. These kleptocrats have aided the establishment of weak political institutions and support through funding and campaign the implementation of policies that support their rent-seeking behaviours.

Undemocratic tendencies that define South Sudan's oil sector including; deep-seated corruption and mismanagement of oil revenues, limited citizen or local involvement in oil exploration and development, extreme violation of human rights such as poor working conditions, lack of transparency and accountability, environmental degradation threatens South Sudanese human security.

Based on this background, the study findings view effective technology transfer policies as critical enablers to addressing the monumental governance crises that bedevil South Sudan. The study posits that technological integration in the oil sector presents a viable opportunity for instilling a sense of transparency and accountability to eschew poverty, conflicts, environmental degradation, and corruption.

Essentially, the study findings highlight that improving the human capacity of locals, especially in technology will play an important role in building local expertise in oil operations which could eventually break the chain of overdependence on foreign firms which play largely a disintegrative role in South Sudan's economy. The study also posits that effective technology transfer policies imply upgrading the technology infrastructure in the oil sector hence improving efficiency and effectiveness in oil exploration and development.

RECOMMENDATION

The study recommends that the adoption of favorable technology transfer policies lies at the focal point of proper utilization of the country's oil wealth for economic development. The government should also enforce the provisions of the Petroleum Act of 2012 and the Petroleum Revenue Management Act of 2013 of South Sudan allow for public scrutiny of oil revenues and expenditures.

This should be complemented by the establishment of proactive oversight mechanisms that ensure the prudent usage of natural resources. To address the existing resentments and disconnects between the

government and the citizenry, the existing regime must put in place necessary frameworks to which the locals' right to development can be adhered to.

This involves ensuring that the locals gain the multiplier effects of oil exploration and development including better infrastructural networks and security. Institutionalization of accountability and transparency process is equally ideal in enhancing the worth of South Sudan's oil exploration and development.

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