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PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Outline, encompassing the systematic assembling of resource materials for doctrinal legal analysis. The study's findings point to statutory deficiencies in that although there are legal provisions for setting up a decommissioning fund, there are no provisions for its application and management, which creates a lacuna for improper, haphazard and poor management and application of the funds. This negates the underlying aim of environmental protection in the decommissioning exercise. There is therefore a need to amend the Petroleum Act, create enabling regulations and empower regulatory bodies to ensure proper and adequate application and management of the decommissioning fund to safeguard effective environmental protection of South Sudan.

1. Introduction

⁷² World Bank “South Sudan Economic Update: Oil Dependency amidst Uncertainty” (2021). <https://openknowledge.worldbank.org/entities/publication/b77c422c-a072-56f5-8b7f-cb224a9c7c71> Accessed 7 April 2023

[https://www.google.com/search?q=International+Crisis+Group.+ \(2022\).+%E2%80%9CSouth+Sudan%E2%80%99s+Oil+Sector%3A+Unrealistic+Expectations%2C+Hard+Choices.%E2%80%9D&eq=International+Crisis+Group.+ \(2022\).+%E2%80%9CSouth+Sudan%E2%80%99s+Oil+Sector%3A+Unrealistic+Expectations%2C+Hard+Choices.%E2%80%9D&gs_lrcp=EgZjaHJybWUyBggAEEUYOdIBC](https://www.google.com/search?q=International+Crisis+Group.+ (2022).+%E2%80%9CSouth+Sudan%E2%80%99s+Oil+Sector%3A+Unrealistic+Expectations%2C+Hard+Choices.%E2%80%9D&eq=International+Crisis+Group.+ (2022).+%E2%80%9CSouth+Sudan%E2%80%99s+Oil+Sector%3A+Unrealistic+Expectations%2C+Hard+Choices.%E2%80%9D&gs_lrcp=EgZjaHJybWUyBggAEEUYOdIBC)

impact the environment, requiring measures to minimise these negative impacts such as air pollution, water pollution, land pollution, amongst other environmental hazards. Several key stages have been identified to be involved in the oil and gas exploration processes. First, search for hydrocarbon-bearing rock formations using geological maps, reviewed in desk studies to identify the sedimentary basis.⁷⁴ The next stage following exploration survey is drilling to confirm the presence of hydrocarbons and the thickness and internal pressure of a reservoir. After an exploration survey, the next step is to carry out an appraisal mainly to quantify the hydrocarbon reserves found.⁷⁵ The goal of exploration therefore is to identify and locate a prospect, to quantify the volume of hydrocarbon that might be contained in the potential reservoirs, and to evaluate the risk inherent to the project itself.⁷⁶

Also forming part of the upstream oil and gas sector is the aspect of oil production. Oil production comes in after an exploration has established the presence of hydrocarbons and the quantity of reserves. The subsequent wells drilled are called ‘development’ or ‘production’ wells.⁷⁷ Drilling entails a whole complex of operations necessary to construct wells of circular sections, applying excavation techniques,⁷⁸ with actual or apparent environmental disturbances. If after drilling, it is found that the well is not economically exploitable, it will be shut down.⁷⁹ The expectation is that the termination of every oil and gas project should be followed by an environmental remediation process. Decommissioning is a vital aspect of a project cycle for the protection of the environment. It involves the removal of industrial installations and structures, including the restoration of project sites, for instance, blocking of holes dug at the project sites, treatment of polluted river sites, back to their original form before exploration and exploitation activities were carried out.⁸⁰ This is usually a capital-intensive activity requiring a regulatory framework for judicious application of earmarked funds for its implementation. In South Sudan, despite provisions under the Petroleum Act, 2012, for setting aside a

Decommissioning Fund by oil companies for the purpose of carrying out decommissioning to protect the environment, much is still left to be desired in terms of practical implementation of the law, as operational sites continue to suffer environmental degradation. The study dissects the processes, legal and institutional frameworks, and challenges relating to the management of the decommissioning fund in the oil and gas industry in South Sudan.

2. Research Methodology

This study applied the doctrinal method of research involving analytical and comparative approaches. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Outline, encompassing the systematic style for assembling resource materials for doctrinal legal analysis, was utilised. The significance of applying the PRISMA Outline is to ensure an all-inclusive and dispassionate unearthing of necessary applicable legal resources, and to decrease the chances of selection bias. The study utilised primary and secondary sources of materials, which involved an organised collection and comprehensive appraisal of extant legal, policy, and scholarly literature on decommissioning and environmental protection in South Sudan. National legal instruments, such as the Transitional Constitution of South Sudan, the Petroleum Act, and regional legal frameworks under the umbrella of the African Union (AU) and East African Community (EAC) for environmental protection, were equally scrutinised.

The methodology focused on the alignment of domestic practices with the “restorative justice” and “polluter pays” principles required by law. In terms of databases, the search for evidence regarding decommissioning obligations was conducted across three primary domains: national statutory frameworks; focused on the Petroleum Act of South Sudan: contractual instruments to identify binding environmental clauses related to the termination of petroleum activities: technical and environmental reports from independent reports (e.g., World Bank,

[DE5OTFqMGo0qAIAAsAIA&sourceid=chrome&ie=UTF-8>](https://www.oil-gasportal.com/upstream/petroleum-exploration/) accessed 23 May 2023

⁷⁴ Joint E&P/UNEP Technical Publication Environmental Management in Oil and Gas Exploration and Production 1997 4.

⁷⁵ Ibid.

⁷⁶ Serintel Srl. “Upstream petroleum exploration” <https://www.oil-gasportal.com/upstream/petroleum-exploration/> visited on 21/12/23.

⁷⁷ Joint E&P/UNEP Technical Publication Environmental Management in Oil and Gas Exploration and Production p. 7.

⁷⁸ Serintel Srl. “Drilling | Introduction to Oil&Gas Well Drilling” <https://www.oil-gasportal.com/drilling/introduction-to-oilgas-well-drilling/> visited on 21/12/23.

⁷⁹ Ibid.

⁸⁰ Salini Impregilo SpA ‘An overview on the decommissioning process in the oil & gas sector’

<https://www.lexology.com/library/detail.aspx?g=06ad2b58-2646-4cbf-9c5f-f5de60145a41> accessed on 23-01-

Operational Policy/ Bank Safeguards – OPBS) to document the physical legacy of non-compliance, such as open waste pits and soil contamination.

This research applied PRISMA's four-phase procedure: identification, screening, eligibility, and inclusion; in sourcing and processing documentation, search reports from reputable institutions, textbooks and articles from major databases of peer-reviewed literature, including Google Scholar, to safeguard clarity, trustworthiness, and assiduousness in the logical examination of laws, policies and literature and for identifying gaps, conflicts, challenges and opportunities for harmonisation. The inclusion criteria focused on documents governing the end-of-life phase of petroleum projects. Regulations regarding the submission and approval of decommissioning plans; liability frameworks for the non-remediation of heavy metal contamination (e.g., mercury, manganese, and arsenic). The screening process evaluated the 'potency' of decommissioning requirements through three analytical lenses: regulatory compliance, establishment of decommissioning funds and implementation of decommissioning plans before the expiration of petroleum agreements, as mandated by the Ministry of Petroleum.

3. Contextualising Decommissioning in Oil and Gas Activities

Decommissioning usually marks the end of an oil and gas project cycle; however, it can occur before the end of the project. When the facility no longer serves a useful social or economic purpose, it needs to be dismantled and the site made available for other uses.⁸¹ As soon as the oil and gas exploration and production project is over, all equipment used on the site must be dismantled and removed, and the environment (land, soil, water) restored to its original state to ensure environmental protection and also create ways for other uses.

Decommissioning and environmental remediation are important aspects of oil and gas projects. Putting in place a relevant legal and regulatory framework, as well as proper training for personnel both in implementation and in regulatory oversight functions,

therefore remains critical for effective discharge.⁸² Decommissioning and remediation processes in South Sudan are primarily governed by the Petroleum Act, supplemented by oil contracts. As a standard, decommissioning is a planned activity; notwithstanding that it usually comes at the end of an oil and gas project, the way and manner the concerned company intends to carry out the activity is pre-disclosed in a decommissioning plan. Consequently, the law requires any company licensed to carry out oil and gas exploration and production to submit a decommissioning plan of its facilities and Wells to the Minister of Petroleum before the applicable licence or petroleum agreement expires or is terminated or before use of the facility ceases permanently.⁸³ It is important for the decommissioning plan to indicate whether the company intends to shut down the facility completely and remove its equipment or to transform the facility to other uses. Remediation is part of the decommissioning process. It is expected that at the end of an oil and gas exploration and production project, the concerned company should be able to restore the affected land. This entails removal of the causes of damage or danger to the environment and the neighbouring communities.⁸⁴ Failure to properly decommission petroleum wells and infrastructure can pose severe health, safety and environmental risks to the public.⁸⁵ For instance, unplugged oil wells pose significant danger to the nearby communities, their farms and their livestock. According to environmental reports in South Sudan, the oil industry has left a landscape pocked with hundreds of open waste pits, with the water and soil contaminated with toxic chemicals and heavy metals including mercury, manganese, and arsenic.⁸⁶ This attests to a failure to carry out proper decommissioning and remediation of the environment by oil companies operating in the country, thus making the case for a comprehensive set of decommissioning regulations more pressing.

4. Conceptual and Theoretical Framework

Environmental remediation is fundamental to sustainable development, environmental justice, corporate social responsibility and environmental stewardship, underscoring the need for propriety in decommissioning exercises.

⁸¹ Irena Chatzis 'Decommissioning and environmental remediation: an overview' (2016) *IAEA Bulletin* 4.

⁸² Ibid.

⁸³ Petroleum Act section 31 (1).

⁸⁴ Ibid section 43.

⁸⁵ Magnus C. Abraham 'he Regulation of Decommissioning, Abandonment and Reuse Initiatives in the Oil and Gas

Industry: From Obligation to Opportunities' (2024) *Journal of Energy and Natural Resource Law* 1.

⁸⁶ OPBS 'South Sudan Ignores Reports on Oil Pollution and Birth Defects'

<<https://www.pbs.org/newshour/world/south-sudan-ignores-reports-on-oil-pollution-and-birth-defects>> accessed on 23-01-25

4.1 The nexus between Environmental Protection and Decommissioning

Environmental protection in extractive industries, including oil and gas operations, is vital for the sustainability of both the environment and the development of society. Decommissioning is the process of uninstalling and dismantling oil and gas infrastructure used during exploration, exploitation and production processes. It includes plugging of wells dug, treatment of polluted rivers and restoration of ecosystems in an attempt to restore the environment to the state or status it was in before the operations of oil and gas production. Decommissioning is a crucial part of environmental management in extractive industries, a neglect of which may lead to environmental degradation including air, land and water pollution, destruction of habitat and ecosystems, and contamination of underground water.⁸⁷ Several important theories underpin decommissioning of oil and gas infrastructure and projects. They include: the polluter pays principle, the sustainable development theory, corporate social responsibility and environmental stewardship theory, and the intergenerational equity theory.

4.2 Polluter Pays Principle and Decommissioning Funds

The Polluter Pays Principle (PPP) is one of the core principles of environmental law, which mandates those who are responsible for pollution to bear the costs of remediation. This explains the requirement of setting up a Decommissioning Fund to meet the cost of uninstallation and dismantling of oil and gas facilities. South Sudan requires oil and gas companies to set aside funds over the period of their operation to ensure the availability of resources for decommissioning and remediation activities when the need arises.

4.3 Sustainability Development Theory and Intergenerational Equity

One of the key philosophical bases on the rapidly growing practice of establishing decommissioning funds is the sustainability development theory and intergenerational equity. In their combined understanding, these theories maintain that in the quest to meet their developmental needs, the present generation should not compromise the ability of future generations to meet their own needs. Environmental

restoration is therefore seen as an important way of preserving the environment for the benefit of future generations.

4.4 Corporate Social Responsibility Environmental Stewardship Theory

These two complementary theories describe the willingness and ability of oil companies to respond to the environmental concerns in the operational communities. According to the environmental stewardship theory, companies are regarded as stewards or custodians of the environment with a moral duty to protect it from harm. The corporate social responsibility theory, on its part, enjoins companies to look beyond profit maximisation as the sole motive of the corporation and to assume social and environmental responsibilities as part of the governance strategies.

The above theories, put together, provide the foundation for the legal and equitable bases for ensuring propriety in the termination of oil and gas activities and for effective restoration of the environment for future use.

4.5 Legal and Institutional Framework for Decommissioning in South Sudan's Oil and Gas Industry

The legal framework for decommissioning in the oil and gas industry in South Sudan is still evolving. The country's efforts at adopting several international environmental instruments for the protection of the environment, including multilateral environmental agreements (MEAs) such as the UN Convention on Biological Diversity, 1992, and the Ramsar Convention on Wetlands, 1971, must be commended. In addition, a handful of domestic law provisions, particularly Article 41 of the Transitional Constitution of 2011, which guarantees the right to a clean and healthy environment, and environmental protection should be mentioned. The Petroleum Act⁸⁸ mandatorily requires oil and gas companies to set aside certain funds to cover the cost of decommissioning after the project cycle. The fund to be set aside by the company as a decommissioning fund is at its discretion, as there is no provision determining the amount. It seems therefore to be left to the respective oil companies to decide on the amount to be set aside, taking into consideration the scale and complexity of the expected decommissioning exercise. Again, there are no specific provisions of the law to govern the application

⁸⁷ See, International Association of Oil and Gas Producers, 'Decommissioning of Oil and Gas Facilities'. (IOGP, 2017)

⁸⁸ Petroleum Act, Section 41

and administration of the decommissioning fund in decommissioning at the end of a project.

In South Sudan, the lead Environmental Protection Agency is the Ministry of Environment and Forestry. However, the agency in charge of supervising decommissioning to ensure that decommissioning plans submitted by oil and gas companies are implemented in compliance with national and international environmental standards and practices Ministry of Petroleum. This Ministry is saddled with the duties of regulating the oil and gas sector and laying down policies, and is also in charge of superintending the execution of decommissioning plans. There is also the South Sudan Petroleum Commission in charge of enforcement of compliance with oil and gas laws, including those for the protection of the environment and decommissioning. Despite the existence of these institutions, regulatory and enforcement mechanisms to ensure compliance with decommissioning plans have remained a challenge. The overlapping institutional responsibilities make compliance with legal and regulatory standards on decommissioning difficult to monitor and enforce.

5. Modes and Steps of Decommissioning

The mode of decommissioning applied to an oil and gas project depends largely on a number of factors, including regulatory requirements, type of facility, nature of environmental degradation, environmental and social risks, and financial considerations. The modes of decommissioning include the following:

5.1 Immediate Dismantling (DECON)

This is the prompt shutdown and dismantling of a facility as soon as operations have ended. The project's infrastructure, equipment and hazardous materials are promptly taken away, and the project site is cleaned up and restored to its previous condition before the project commenced. Although this mode of decommissioning requires the availability of adequate funds, it decreases the monitoring costs and long-term risk of environmental degradation.

5.2 Safe Enclosure (SAFSTOR)

This mode of decommissioning entails the maintenance of a project facility in a safe and stable condition over a period of time, and is usually applied where very dangerous hazardous chemicals and materials are involved, to enable reduction of environmental risks before uninstalling or

dismantling. For instance, in the case of nuclear reactors.

5.3 Entombment (ENTOMB)

This mode of decommissioning involves the permanent putting away or containment of dangerous and hazardous materials by sealing or encasing in a durable structure. The encased dangerous materials require indefinite monitoring, long-term environmental liability and restriction of land use, although it removes immediate dismantling costs.

5.4 Partial Decommissioning

This mode of decommissioning entails the dismantling or removal of certain parts of structures or platforms of the facility while retaining other parts for the purpose of reuse, continuous operation or repurposing. This is usually applied in offshore oil platforms or installations, including industrial complexes.

The steps in the decommissioning process are methodological and highly regulated, encompassing various stages as follows:

Assessment and Planning

At this stage, the nature of the project is evaluated via feasibility studies to determine the risks involved, for instance, in terms of how dangerous the hazardous materials are and how sensitive it is to the environment, in order to develop and adopt the best possible decommissioning plan, with costs and timeline for execution.

Regulatory Approval

Necessary permits and approvals required before embarking on decommissioning activities are sought and obtained from the relevant regulatory environmental and safety institutions or authorities, to guarantee compliance with national and international standards.

Decontamination

This involves the cleaning up of equipment and structures or removal or neutralisation of dangerous or hazardous materials or harmful substances such as chemicals and radioactive materials, to reduce the risk of harm to humans and the environment.

Dismantling and Demolition

Specialised techniques are applied in uncoupling and dismantling of infrastructures, platforms, structures and equipment in order to decrease environmental impact such as air and noise pollution by dust control and noise reduction.

Waste Management

This entails the disposal or discharge of hazardous wastes in approved facilities or approved channels. It includes recycling of waste materials, and separation of wastes into hazardous and non-hazardous wastes for proper standard dealings in an acceptable and authorised way and manner.

Site Remediation

Certain activities, including re-vegetation, groundwater cleanup and soil treatment, are carried out to restore the project site back to environmentally acceptable standards and conditions for safe use.

Monitoring and Verification

At this stage, post-decommissioning environmental monitoring is carried out to confirm or verify the site meets regulatory and safety standards for release of the site for reuse.

Site Release or Reuse

Once the site has been confirmed as safe for reuse, it may be released for use and may be repurposed for recreational, commercial, agricultural or industrial use.

6. Challenges In The Management of Decommissioning Fund in Oil And Gas Industry In South Sudan

Notwithstanding the recognition of the importance of decommissioning and the provision for a decommissioning fund⁸⁹ in the oil and gas industry in South Sudan, for the realisation of environmental protection, several challenges abound. This involves mainly the lack of legal provisions on administering

the decommissioning fund in South Sudan and several challenges that have been observed elsewhere.⁹⁰

- A clear financial mechanism for setting aside a decommissioning fund by oil and gas companies is lacking in the law. This creates doubt as to the sufficiency or otherwise of the funds set aside to cover decommissioning.⁹¹
- Coordination between the Environmental Protection Agency and the Ministry of Petroleum in the supervision and management of the decommissioning process and activities is weak.
- Lack of technical capacities of the agencies to regulate and oversee the decommissioning process and activities. It also requires knowledge of responsibility for the mentioned damage, and the responsibilities of the parties to the oil contract towards international conventions and the text of their own contracts.⁹²
- There is no holistic legal framework in respect of decommissioning funds and processes, including specific management of decommissioning funds, which creates a vacuum in the administration of decommissioning funds, contributing to failure of environmental protection where decommissioning has failed.
- Enforcement mechanisms for compliance with decommissioning are weak, thereby resulting in non-compliance by companies and ultimately failure to protect the environment. Striking a balance between oil exploitation and environmental protection becomes a major challenge. This comes from the conflict of interests and the enthusiasm for maximum profitability.⁹³
- The current political instability and conflicts in South Sudan represent a stumbling block in the management of decommissioning funds. The situation weakens the government's ability and capacity to make and enforce the right laws to address the situation, ensure compliance and effective allocation and management of decommissioning funds and processes for the

⁸⁹ Petroleum Act, Section 41.

⁹⁰ Ikechukwu Chime & Akachi Lynda Nwogu-Ikoj "Legal Framework for the Regulation of Abandonment and Decommissioning in Nigeria" (2024) 11 (2) *Nnamdi Azikiwe University Journal of Communication and Media Studies* 154-167.

⁹¹ Juliet Komugisa & Ngozi Chinwa Ole "Ugandan Legal Framework on Decommissioning Fund: Is There an

Achilles Heel, and Can Lessons from the UK Help?" (2018) 16 *Journal of Oil and Gas Law* 20.

⁹² Ibid. p 73.

⁹³ Amjadian et al.: "Execution of Oil Contracts on the Basis of Environmental Standards in US and Iran's Law" (2022) Vol. 10 4 *Quarterly Journal of Environmental Education and Sustainable Development* . 74.

preservation and protection of the environment.

7. Environmental Significance of Decommissioning and Restoration

A comparative analysis of decommissioning funds requirements in Norway, the United Kingdom (UK) and Nigeria reveals the environmental importance of decommissioning by ensuring adequacy of funds and application of decommissioning plans under strict legal provisions and institutional regulations, to achieve environmental protection. For instance, in the UK, there is first and foremost the admission that decommissioning is an expensive process, often requiring significant capital investment, and that estimating decommissioning costs accurately can be challenging, given the long lifecycle of offshore assets and the uncertainty surrounding the eventual timing of decommissioning.⁹⁴ Therefore, there is an enforcement of legally binding decommissioning programmes with continuing liabilities on operators, thereby guaranteeing that obligations are fulfilled even after a transfer of licence. In Norway, financial guarantees are required to be executed with strict state supervision to ensure security, adequacy and availability of decommissioning funds. Norwegian regulation stipulates both who is responsible for conducting the decommissioning, and who is liable for damage or inconvenience caused willfully or negligently in connection with disposal of the facility or other implementation of the decision.⁹⁵ While in Nigeria, escrow-based decommissioning funds, independently managed with regulatory access in the event of failure of compliance, are mandatory.⁹⁶ Environmental degradation arising from oil and gas operations has far-reaching economic and social implications; hence, the significance of decommissioning as a part of the business process of oil and gas operators to ensure environmental protection via remediation and restoration of the environment at the end or during the project lifecycle, as the occasion demands.

Decommissioning plays a significant role in environmental protection and sustainable

development.⁹⁷ It helps in preventing air, water and land pollution; restoring ecosystems; reducing waste; sustaining climate benefits. It further helps in protecting public health; reclaiming land and creating economic opportunities for reuse of land for agriculture and housing, including employment opportunities in waste management; and ensuring environmental accountability and environmental justice via compliance with environmental laws and standards.⁹⁸

8. Recommendations

In order to surmount the identified challenges to ensure environmental protection where the decommissioning fund is properly managed in South Sudan, the study makes the following recommendations:

- A comprehensive law that governs the establishment, administration and application of decommissioning funds in the oil and gas industry should be enacted with clear financial provisions and detailed procedures for decommissioning activities.
- Due to the technical and specialised nature of decommissioning activities, a special body should be established specifically to regulate and manage decommissioning activities in the oil and gas industry.
- The enforcement mechanisms for compliance with decommissioning should be strengthened to cover both financial requirements and decommissioning processes and activities. Periodic audits and reports on decommissioning funds and activities should be mandatory, and penalties for non-compliance should be expanded from payment of fines to include revocation of license for oil and gas production.
- A National Decommissioning Fund administered by a Fund Manager or Board should be established where all oil and gas companies deposit decommissioning fund contributions to ensure the availability of funds to conduct decommissioning even

⁹⁴ Calum Crighton "Decommissioning Contracts in the Offshore Industry: Key Legal Considerations and Challenges" at <https://gilsongray.co.uk/blog/decommissioning-contracts-in-the-offshore-industry-key-legal-considerations-and-challenges/> visited on 23-06-26.

⁹⁵ Ignacio Herrera, Anchustegui Gunnar S., & Eskeland Frode Skjeret *Understanding decommissioning of offshore infrastructures: A legal and economic appetizer* (Centre for Applied Research, 2022). 59.

⁹⁶ See, the Petroleum Industry Act, 2021, ss. 232 -233

⁹⁷ Beck and Pollitzer "Decommissioning: Process, purpose, key stages & considerations" <https://beck-pollitzer.com/decommissioning-a-step-by-step-guide-to-process-key-stages-considerations/> visited on 23-06-26.

⁹⁸ Irena Chatzis "Decommissioning and environmental remediation: an overview" <https://www.iaea.org/sites/default/files/5710405-overview.pdf>. Visited on 23-06-26.

where a company is experiencing financial distress.

- There should be a period of training of staff of government institutions in charge of decommissioning to boost their expertise and technical capacities to supervise decommissioning activities and environmental management for protection of the environment.
- There should be provisions of law that require mandatory reporting and publication of the status of the decommissioning fund and progress of decommissioning activities, including a final environmental assessment report after decommissioning to measure and show improvements in the environment.
- The government of South Sudan should establish collaborations and partnerships with multinational oil and gas companies to prioritise accomplishing decommissioning activities to ensure environmental protection.

9. Conclusion

There is no doubt that South Sudan, under its extant legal framework, has made some efforts for the protection of its environment in the oil and gas industry. However, some challenges still persist, thus hindering the achievement of environmental protection. It is noted that proper management of decommissioning funds is vital for the achievement of successful decommissioning activities for the protection of the environment. Therefore, establishing a comprehensive legal framework providing for financial management and accountability of decommissioning funds and activities, engaging highly skilled manpower, creating specialised institutions to regulate and supervise decommissioning activities with a transparent reporting system, will enhance effective environmental protection in South Sudan's oil and gas industry.

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