

Assessment of Tanzania's Legal Framework on Regulation of Industrial Air Pollution in Comparison with China

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Abstract

This paper evaluates the environmental legal frameworks of Tanzania and China regarding industrial air pollution, comparing their approaches to international treaties and domestic enforcement. It highlights Tanzania's lag in implementing international environmental standards compared to China. The analysis discusses the effectiveness of these frameworks in regulating industrial emissions and the adherence to international agreements.

Keywords

Environmental Law, Industrial Air Pollution, Industrial Decarbonisation, Coordinated Environmental Legal Framework

1. Introduction

All living and non-living entities and their effects on human life collectively refer to the general term “environment” (Unacademy, 2022). It implies that the environment unites all inanimate creatures and forces at work in the natural world, including man. Following the notion that making use of “one's land not to be detrimental to another”, the scientific community has recently reached the relevant conclusion that the increase in such environmental risks is primarily due to anthropogenic activities (Stocker, 2013). Among the many detrimental effects of anthropogenic activity that eventually disrupt the environment are the heavy industries. The air, water, and soil are all contaminated due to the harmful gases and effluents discharged into the environment.

The causes of environmental destruction have existed for many generations. Environmental issues have always been a feature of human society, dating back to

ancient Rome, the Middle Ages, and the Industrial Revolution (Campbel & Breen, 1993). The notion of environmental preservation began in the US in the 1870s, leading to the establishment of rules for protecting national parks and forests. However, Campbel and Breen added that it was not until the late 19th and early 20th centuries that the idea that ecosystems, water bodies, and air masses require special legal protection gained widespread acceptance. Following World War II, nations began to pay greater attention to environmental challenges. However, before the 1960s, no distinct local or international legal category was known as “environmental law”.

The emergence of “green” political organisations, such as ecological political parties and active nonprofit organisations, began in the early 1960s, giving political expression to many environmentalist philosophical themes. The movement sought to influence public policy and advance social and environmental principles in the industrialised West. There was growing support for stricter government regulation of industry. In light of this, environmentalism, a philosophical movement that sought to redefine humanity’s relationship with nature, finally gave rise to environmental legislation (Elliott, 2021). The concept acquired further traction in the late 1960s when European nations like Finland, France, and Germany established laws to enhance the protection of natural resources. Following this, regional and international agreements were reached in the 1970s on a variety of pollution and wildlife conservation issues to resolve environmental challenges (Kiss & Shelton, 1994). Since then, all industrialised nations and many emerging ones have made environmental protection a key component of their domestic legal frameworks.

Economic restructurings in the late 1970s stimulated rural industries’ growth and worsened the issue in China (Yu, 2014). Environmental issues are, therefore, a primary priority for the Chinese government, and emissions trading has garnered a lot of attention in this regard (Han, Olsson, Hallding, & Lunsford, 2012). Many environmental laws have been passed to provide guidelines for resource use, pollution prevention and management, and ecological conservation. In that regard, studies show that industrial pollution has become a major environmental problem in modern China due to the stress that China’s rapid industrial development has placed on the country’s ecosystem. In 2007, China surpassed the United States as the world’s largest producer of carbon dioxide, the main greenhouse gas (Lan, 2013). This is a significant record in the follow-up of subsequent measures taken by China to address environmental problems.

On that basis, authorities in China were inspired by the expanding global focus on environmental and development issues, including the passage of environmental legislation by industrialised nations (Mu, Bu, & Xue, 2014). China’s environmental circumstances have worsened since it became a major global producer, seriously harming people’s health and negatively affecting society over an extended period. Meanwhile, significant adjustments have been made to emission and environmental rules, notably the shift from lax to strict execution. Numerous national initiatives have been started and implemented, including the Air Pollution

Prevention and Control Action Plan, the 2015 Environmental Protection Law, the 2017 Environmental Protection Tax Law, and others (Jin, Andersson, & Zhang, 2016).

Since its independence in 1961, Tanzania's industrial sector has undergone several phases, including undeveloped and embryonic industrialisation, driven by the state through import substitution, and brought about by structural adjustment plans and policy changes. However, most laws that control how the environment is utilised can be classified as environmental laws only because they address some aspect of the natural or human environment. The first legislation indicating the government's interest in environmentally conscious growth was the National Environment Management Council Act of 1983. The Environmental Management Act has recently repealed Act No. 20 of 2004 (Pallangyo, 2007).

Ecosystems, natural resources, and economic activities create opportunities and environmental difficulties. In that regard, Tanzanian air pollution is caused by various sources such as industrial, automotive, and smoke emissions (Felix & Gheewala, 2011). Moreover, Tanzania's desire to industrialise and build a strong, competitive economy that can produce sustainable growth would probably cause it to use more natural resources than it can currently. Therefore, without a comprehensive sustainable development scheme supported by effective environmental laws, such industrialisation will likely bring serious environmental consequences. Hence, this paper attempts to answer the question of whether Tanzanian environmental legislation can manage industrial air pollution compared to Chinese environmental legislation.

2. Rationale

Tanzania and China have ratified members of several treaties related to environmental protection. However, it is noteworthy that both nations have domestic legal frameworks that respond to international restrictions on industrial air pollution to varying degrees. Building on such circumstances, Article 1 of the Rio Declaration prioritises human rights for sustainable development, stating that everyone has the right to a productive, healthy existence in balance with the environment (UN, 1992). Based on a world call for giving rights to habitable environments to future generations, securing the present environment is imperative regardless of differences in legal systems. On that note, China has made more efforts to formulate specific environmental laws to prevent environmental damage from industrial air pollution (Yan, 2021).

The 2021 Tanzania National Environmental Policy, to address challenges of industrial air pollution, the Government of Tanzania has taken, developed and implemented several initiatives, programmes and projects. However, the country's environmental legal framework is far behind in implementing international environmental standards in the context of industrial air pollution. It is in line with its present efforts to advance and carry out Development Vision 2025, and the country aspires to create an industrialised economy that is robust, competitive, and capable of generating sustainable growth. It aims to exploit natural resources,

leading to high productivity and modern and efficient transport and communication infrastructure. Moreover, it is a well-known phenomenon that economic development without environmental considerations causes an environmental crisis, contrary to sustainable development principles.

3. Theoretical Justification

The theoretical justification is based on John Rawls' "A Theory of Justice", which calls for giving rights to future humans because they will compete with present humans for a habitable environment. Rawls stated that savings for future generations adhere to the same fairness criterion as savings for current generations. Thus, the disparity in time should be disregarded from a just perspective (Rawls, 1999). Since it can consistently satisfy all requirements for a conception of ecological justice, Rawls' "A Theory of Justice" is a suitable theory to derive one. When deciding how rights to environmental services should be distributed, it is possible to extend Rawls' original argument to include representatives of the present and all true future generations. There would be consensus on two tenets of ecological justice: (1) Every person, living or dead, has an equal and unalienable right to an entirely sufficient set of necessary and non-substitutable ecosystem services that are compatible with an identical set for everyone, and (2) Any differences in how the remaining ecosystem services are distributed should be directed towards the greatest good of the most underprivileged members of the existing generation and all forthcoming generations (Rawls, 2001). The second ecological justice principle takes precedence over the first.

The intergenerational equity philosophy, which maintains that the current generation is entrusting future generations with natural resources, lends further credence to the argument. According to the author of the book *Fairness to Future Generations*, all members of our species share the natural surroundings of the planet. In that case, the current generation owes it to the next generation to protect the earth. We also have the right to use and profit from it as beneficiaries (Weiss, 1990). This means that any theory of intergenerational justice in our natural environment must consider two relationships: the relationship of current species with other generations and that of the existing generation with the natural system. Due to this, intergenerational equity advocates for equality across generations, believing that each generation has a right to pass on a healthy and generally better world than its ancestors. This implies that every generation has a claim to at least the same level of planetary health as the first.

The theories are compatible with the ongoing "Sustainable Development" concept that strives for development that satisfies current demands without jeopardising the capacity of future generations to meet their own needs. The idea is the study's foundation because it places people at a centimetre of environmental attention. The theories are, therefore, relevant in comparatively assessing the quality of environmental legislation of Tanzanian and China in the context of management of industrial carbon emission.

4. International Legal Frameworks Governing Industrial Air Pollution: An Overview

The late 1960s saw the emergence of international environmental legislation when European nations passed laws to strengthen resource protection (Kiss & Shelton, 1994) (Wang, 1999). To address environmental issues, legally binding regional and worldwide agreements on various environmental concerns were made in the 1970s. Despite the large number of environmental agreements at the international, regional, and bilateral levels, customary international law still has a big influence (United Nations, 2018). The international community adheres to certain shared norms when working on environmental protection projects. The tenets encompass the following: shared but distinct responsibilities, precautionary measures, good neighbourliness and international collaboration, sustainable development, and preventive action. These recommendations cover many subjects, including minimising environmental damage and promoting global cooperation to lessen its effects. The 1992 Rio Conference resulted in adoption of the Rio Declaration on Environment and Development, which established the fundamentals of international environmental law. Some principles are emerging rules within customary international law, while others are established laws. However, other principles are aspirational norms or guiding criteria for interpretation with less normative status.

Preamble 2 of the UN Charter reaffirms the belief in the equality of men and women, the worth and dignity of every human being, and the fundamental rights of every nation, regardless of size. The Universal Declaration of Human Rights, which forms the cornerstone of freedom, justice, and international peace, states that every member of the human family possesses inherent dignity and equal and unalienable rights (United Nations, 1948). Preamble 1 of the Universal Declaration of Human Rights, which is part of the International Covenant on Civil and Political Rights, states that freedom, justice, and world peace are contingent upon the realisation of every member of the human family's inherent dignity and equal and inalienable rights. Consequently, the allusion to the entire human family, comprising all generations, has a progressive element. The ideas of equal rights and inalienable rights support the fundamental equality of all generations within the human family. Consequently, these tools disclose an underlying conviction on the worth of each individual throughout human society. Because of this, it is now commonly accepted that everyone has a fundamental human right to a healthy natural environment.

International recognised legal instruments have established legally binding obligations that apply to all member nations to guarantee that future generations are provided with safe and secure living conditions. Human actions shall not endanger the integrity of the species they coexist with or the ecosystems in which they live, according to Article 4 of the 1982 World Charter for Nature. Similarly, human activity that damages the ozone layer endangers the environment and human health, which is why the Vienna Convention for the Protection of the Ozone Layer

(1987) was established. In this case, the aim of the Montreal Protocol and the Vienna Convention is to protect the environment and public health from harm brought on by human activities that degrade the ozone layer. Article 3 of the Convention on Biological Diversity also outlines the ideas of State sovereignty over natural resources and abstaining from harming others. Adopted concurrently, they conform to the principles delineated in the Rio Declaration on Environment and Development in 1992.

The legally binding Paris Agreement is the main item on the industrial decarbonisation agenda. The Agreement's paragraphs 2 and 4 state that increases in the world average temperature must stay "well below 2°C" and that "efforts" must be made to keep the increase to 1.5°C. As Article 2 (2) of the Agreement mentions, achieving this goal also requires taking equality and the notion of common but differentiated tasks and corresponding capabilities into account in light of distinct national conditions.

It is significant to remember that all parties are committed by the Agreement to preparing, communicating, and maintaining successive nationally determined contributions; communicating a new nationally decided contribution every five years; and providing the information required for transparency and clarity stated by Article 4 (2) (3) (8) and (9) of Paris Agreement and in order to reach the goals of their nationally specified contributions, the parties agree to pursue domestic mitigating measures. As a result, the Agreement requires all parties to act and imposes obligatory procedural obligations on them, but it makes no binding obligations regarding the implementation or fulfilment of nationally decided contributions. Since this is the first time in history that all nations have united behind a single legally enforceable agreement to battle climate change and prepare for its ramifications, the agreement represents a historic step forward in the global climate change process.

5. Policies Related to Industrial Air Pollution in Tanzania and China: An Overview

The significance of China's national air quality policies escalated with the implementation of the Air Pollution Prevention and Control Action Plan (APPCAP) in 2013. This extensive plan established the foundation for mitigating significant air pollutants, such as particulate matter (PM_{2.5}), sulfur dioxide (SO₂), and nitrogen oxides (NO_x) as detailed in the Health Impact of China's Air Pollution Prevention and Control Action (Huang et al., 2018). From the commencement of APPCAP to 2021, particle pollution exposure reportedly decreased by an average of 42.3 percent among the Chinese population (Chicago, 2023). This reduction underscores both the direct effects of the policies and the Chinese government's dedication to perpetually improving air quality through its environmental legislative framework.

The primary aim of China's air quality policies is to decrease PM_{2.5} concentrations. By 2025, the Chinese government intends to reduce PM_{2.5} concentrations

in urban areas by 10% relative to 2020 levels (Chu, 2023). The sustained implementation of emission reduction regulations in China has resulted in a significant 54% reduction in PM_{2.5} levels in Beijing from 2012 to 2020 (Wen et al., 2024). Significant reductions can be ascribed to a mix of rigorous regulation enforcement and public awareness initiatives that have highlighted the need of clean air for public health. An essential element of the efficacy of China's air pollution regulations is the differentiation between short-term and long-term strategies. In response to significant worldwide events, the government has frequently enacted stringent short-term measures, including temporary industry closures and transportation restrictions, leading to prompt enhancements in air quality. Nonetheless, these alterations are typically transient; for instance, PM_{2.5} concentrations frequently return to pre-event levels following the removal of limitations. Conversely, long-term interventions, shown by the APPCAP and subsequent action plans, have demonstrated greater efficacy in maintaining air quality enhancements over time (Wen et al., 2024).

China's initiatives to mitigate air pollution have also had considerable ramifications for public health. Enhanced air quality has been linked to diminished healthcare costs and lowered disparities in healthcare access among the populace. Nonetheless, a balance must be achieved; although environmental quality is essential, the economic implications of rigorous air quality regulations must be considered.

The general overview of China's air quality policies in response to Resolution 7 of the UN Environment Assembly (UNEA-1) describes the national policies that affect air quality, drawing from research on air quality carried out by the United Nations Environment Programmes (UNEP) in 2015 (United Nations, 2015). According to the study, China has enacted several new air quality regulations, but because of the intricate nature of these regulations, as well as the associated legal and administrative framework, their implementation is difficult. China's National Ambient Air Quality Standards either fall within WHO Interim Targets or closely match WHO standards. A thorough plan for preventing and controlling air pollution that spans three important regions and ten city clusters is presented in the 12th Five-Year Plan on Air Pollution Prevention and Control in Key Regions. Stronger governance, technical innovation, industrial location, and industrial restructuring are the main objectives of the 2013 Air Pollution Prevention and Control Action Plan.

Using films, posters, and other promotional materials, the Clean Air Action Plan 2014 established an assessment system emphasising enhancing air quality and promoting public involvement. Since 2011, there have been revisions to current rules or the establishment of new ones, requiring big polluting businesses to gradually adhere to the tightest international emission limits on airborne contaminants. In 47 cities in the most polluted regions of China, designated industries include thermal power, iron and steel, petrochemicals, cement, non-ferrous metals, and chemicals. China must not only improve its current policies but also

ensure that economic development is in harmony with environmental sustainability as it continues to navigate the intricacies of air pollution reduction. The pursuit of cleaner air is a continuous process, and the efficacy of these policies will ultimately determine the quality of air for future generations.

On the contrary, the research conducted in Tanzania by United Nations Environmental Programmes (UNEP) on Air Quality in 2015 on Air Quality Policies in response to UNEA-1 Resolution 7 noted that information regarding the overall situation with responsibility in Tanzania, including key air quality challenges, Air quality monitoring system, National Ambient air quality standards, and National Air Quality Policy was not found (United Nations, 2016). However, the Environmental Management (Quality Standards) Regulations, 2007 was found to be the only available legislation in place making enforcement on a complex matter of air pollution control in the country. The research also mentioned several installations, the absence of incentives for energy efficiency such as subsidies, labels, and rebates, and the lack of advocacy for investments in renewable energy.

Tanzania encounters considerable difficulties in the implementation and enforcement of its extensive policy framework. The implementation of current air quality rules is ineffective, chiefly due to insufficient resources, inadequate training for authorities, and a deficiency in public understanding of environmental standards. For example, although the Environmental Management Act mandates rigorous compliance with pollution control measures, the practical implementation and oversight of these policies sometimes lack consistency. Reports reveal that, notwithstanding legislation, air pollution in metropolitan areas persists in beyond permissible levels, underscoring deficiencies in effective enforcement. Additionally, several industrial sectors, such as mining and manufacturing, significantly contribute to air pollution; yet, attempts to control these industries efficiently are obstructed by political and economic limitations. This leads to behaviors like unregulated garbage incineration and unmanaged car emissions, exacerbating environmental damage. Enhancing air quality necessitates the fortification of the legal framework and the assurance of compliance via sufficient monitoring and enforcement systems. Additionally, there were no incentives for installing pollution-prevention devices or clean production. Nothing has changed as of the time this paper was written.

6. Environmental Laws Align with Economic and Industrial Development Strategies: Tanzania and China

In 2024, Tanzania implemented essential Environmental Management Regulations designed to establish a strong legal framework for safeguarding environmental integrity while promoting economic development. The Environmental Management (Integrated Coastal Zone Management) Regulations emphasize the sustainable development of coastal resources, which is vital due to Tanzania's dependence on these regions for tourism and fisheries. These policies promote sustainable resource utilization, aligning with broader economic objectives to enhance entrepreneurial activity in the tourism and fishing sectors, which considerably

contribute to the nation's GDP (LLP, 2024). Furthermore, the Environmental Management (Right to Compensation) Regulations delineate liability frameworks for environmental harm resulting from industrial activities, thereby incentivizing polluters to comply with sustainable measures. This component not only safeguards the environment but also fosters a business climate in which corporations are motivated to invest in cleaner technology to evade financial liabilities. Tanzania aims to improve its appeal to foreign investors by establishing a more predictable regulatory framework, essential for achieving its goal of being a middle-income nation by 2030 (LLP, 2024). The congruence between the nation's economic objectives and its environmental regulations is manifested in the implementation of Environmental Impact Assessments (EIA) for new industrial initiatives. The obligation for enterprises, particularly in mining and agriculture, to perform Environmental Impact Assessments guarantees that economic endeavors do not undermine environmental norms. The regulatory standards highlight Tanzania's dedication to sustainable development alongside economic growth, marking a progressive advancement in reconciling industrial aspirations with environmental accountability.

China's fast economic growth has traditionally incurred considerable environmental detriment, necessitating the implementation of more rigorous environmental rules (CRSReports, 2006). The creation of a thorough legal framework for environmental protection signifies the acknowledgment that sustained economic progress is unattainable without the preservation of natural resources. The Chinese government has adopted a paradigm termed "Green Development", which incorporates environmental considerations into its economic policies. This encompasses policies such as the 2015 amendment of the Environmental Protection Law, which underscores the obligation of firms to implement eco-friendly activities. The strategic enforcement of rules like the Pollutant Discharge Permit System effectively coincides with China's economic objectives by necessitating that industries use more efficient and less polluting technologies. Such legislation promotes innovation within the industrial sector, hence improving productivity and competitiveness in global markets, since it addresses the increasing international need for sustainable products.

Moreover, China's dedication to diminishing carbon emissions, coupled with its substantial investment in renewable energy, exemplifies the growing emphasis of industrial policy on sustainability. The government's plan to peak carbon dioxide emissions by 2030 demonstrates a desire to align environmental policy with its broader economic goals. Furthermore, the Chinese government actively participates in international collaborations and complies with global environmental standards, thereby demonstrating the congruence of its environmental policies with industrial objectives. By implementing regulations that encourage foreign direct investment (FDI) in environmentally friendly industries, China not only complies with ecological standards but also aims to enhance its economy through sustainable practices. This collaboration among policy frameworks enables China to address environmental degradation concerns while sustaining strong industrial

growth.

The success of both nations in realizing their economic objectives while maintaining environmental sustainability will hinge on the efficient execution of these regulatory frameworks and the continuous cooperation between the public and private sectors. As global consciousness regarding environmental concerns increases, the experiences of both nations may offer essential insights for reconciling development with ecological conservation.

7. Tanzania's Legal Framework on Industrial Air Pollution

The United Republic of Tanzania works with other nations to manage the environment globally. The country is a signatory to several regional and international environmental protection agreements. Therefore, this part covers the major legislation regulating Tanzania's air pollution.

7.1. The Constitution of the United Republic of Tanzania 1977

Tanzanians are committed to environmental protection because the constitution requires them to do so to protect human life. According to Article at of the Constitution, every person has the right to life and the social protection of that life in conformity with the law. In the seminal case of *Festo Balegele v. Dar es Salaam City Council* (1991), the High Court ruled that the plaintiffs' fundamental rights to a healthy environment were breached by the City's decision to locate the rubbish dump close to residential areas. According to the court's interpretation of this clause, everyone is entitled to a healthy environment. In that case, the judges looked to Article 14 of the Constitution to determine how the law should be read regarding the rights to govern, protect, and live in a clean and healthy environment.

Additionally, Tanzania's Constitution contains a clause that sets the foundation for the sustainable use and management of the country's environment and acts as the foundation for the legislative framework that governs it. It is a provision to safeguard natural resources, particularly the environment. Article 27(1) of Tanzania's Constitution states that everyone must protect and safeguard the nation's natural resources. In this regard, the Constitution contains clauses that do not explicitly address environmental management and conservation, but impliedly, they impact those issues. Nevertheless, environmental protection does not have roots in the constitution. The situation can make the judiciary unsure of the legal foundation for this clause in the country's fundamental law. It might not always ensure how a particular judge views the environmental issue.

The Constitution also lacks explicit provisions that guarantee public participation in environmental decision-making processes. While citizens are obligated to protect natural resources, there are no established legal channels through which they can influence industrial projects that may affect their environment. This absence of participatory governance can lead to top-down approaches that disregard community input and undermine the principles of democracy and social justice.

Public engagement is essential for the effective governance of environmental issues, particularly in contexts involving industrial air pollution. When citizens are excluded from decision-making, the resulting policies and regulations often fail to reflect the needs and rights of affected communities. The Constitution's silence on this matter is a significant drawback in empowering citizens to hold polluters accountable and participate actively in environmental protection.

7.2. Environmental Management Act 2004

The Government of Tanzania enacted the Environmental Management Act (EMA) to establish the legal foundation for environmentally sustainable management. The preamble of the act describes, among other things, the foundation for using international environmental instruments and management concepts. Every Tanzanian citizen is guaranteed a clean, safe, and healthy environment under Sections 4(1) and (2). Public spaces for commerce, leisure, education, health, spirituality, and cultural reasons are guaranteed to all citizens. The law also grants the ability to file a lawsuit against anyone jeopardising the environment. It states that anyone whose right is violated by an act that could endanger the environment may file a lawsuit against the offender, as stated in section 5(1). In this case, the Act recognises protecting human life as a critical and constitutional right.

The Act under Section 5(3) also states unequivocally that the principles of sustainable development and the environment must serve as guidelines for exercising power or performing any function. It provides that environmental and sustainable development principles should inform any decision, order, power exercise, or function performed by a tribunal, court, or other person exercising jurisdiction: precautionary measures; polluter pays principle; principles of the integrity of the ecosystem; public involvement in the formulation of environmental policies, plans, and procedures; access to justice; principles of equity within and between generations; principles of international cooperation in the management of ecological resources shared by two or more states; and the common but differentiated principle. The principles are a *replica* of the general guidelines and standards of international environmental law derived from treaties, agreements, and practices. The state of affairs demonstrates compliance with international standards related to safeguarding the environment in Tanzania.

The Act under Section 7(1) confers the sake and duty of every citizen to safeguard the environment. It involves reporting any behaviour or occurrence that might harm the surroundings to the relevant authorities. The Act aims to enhance, conserve, protect, and manage the environment. Every person exercising the power under Section 7(3) must adhere to the listed environmental management standards to fulfil the stipulated purpose. On that note, protecting the environment from harm becomes everyone's responsibility, including the military. In the context of this paper, field training regulations are necessary for military units and institutions (as formal organisations) to protect the environment.

The Environmental Management Act, under sections (1) (c), (3) and 14, gives the National Environmental Standards Committee the authority to create, evaluate,

and present to the Minister a proposal for environmental standards and requirements, including those about air quality. After approval, the Minister publishes the ecological standards and criteria in the Government Gazette. Everyone engaging in any activity must follow environmental quality standards and requirements. The National Environmental Standards Committee shall establish standards and guidelines for controlling air pollution from both mobile and stationary sources and standards and procedures for ambient air quality, occupational air quality, and any other air emission quality standards. Section 145 must also specify standards and methods for measuring air quality.

The Environmental Management Act's Part 16 of sections 184 and 185 has regulations about accomplishment and compliance. The law imposes penalties for failing to preserve records, for willfully falsifying any documentation, and for failing to submit an environmental impact assessment or making a misleading declaration on the subject. It is illegal to release any hazardous materials or pollutants into the environment, which would be against the Act. Furthermore, sections 186 and 187 prohibit the exchange, ownership, or disturbance of a biological diversity component's habitat. The law also makes it illegal to disobey an easement, conservation, or environmental restoration order issued by the following. Furthermore, it is against the law to leave any trash on any public or private property. Depending on the specific article and the circumstances surrounding the offence, the prescribed penalties may include, among other things, a fine or a sentence of up to twelve years in jail (or both).

It is important to remember that a person or business entity cannot be cleared of liability in any civil action brought under this Act under section 192 by eviction for an offence. Nonetheless, an individual will not be held guilty of an offence if they can demonstrate that the crime was committed without their knowledge or consent and that they took all appropriate precautions to avoid the crime, taking into consideration all pertinent evidence. Moreover, the Act under section 179 provides the framework for putting regional or international environmental accords into effect by directing the minister to propose and draft legislation for consideration in carrying out agreements. The minister must also determine what steps are necessary to implement such contracts. The process aligns with the constitutional provision, which entails a dualistic approach to implementing regional or international treaties in Tanzania. Moreover, the Act gives the Minister the authority to create regulations to put them into effect.

The EMA's provisions concerning enforcement are notably insufficient, creating significant barriers to effective implementation. The Act grants broad powers to the National Environmental Standards Committee (NESC) to establish air quality standards and environmental criteria. However, the actual enforcement of these standards remains a considerable challenge due to inadequate resources, insufficient training for enforcement officials, and a lack of coordination among relevant agencies. Additionally, penalties outlined in the Act for non-compliance can be seen as weak or insufficiently deterrent. While the EMA prescribes penalties for environmental offences, including fines and imprisonment, the reality is that

these sanctions are rarely enforced, particularly against powerful industrial entities. As a result, the perceived low risk of facing significant penalties discourages compliance with environmental standards. This enforcement gap highlights a disconnect between the legal frameworks of the EMA and the realities facing environmental governance in Tanzania.

Another critical area of concern is the EMA's interaction with existing environmental and industrial legislation. The Act emphasises environmental sustainability, yet it operates within a broader regulatory landscape often focused on development and economic growth. For example, law enforcement agencies and regulatory bodies may prioritise economic objectives over ecological considerations, leading to conflicts between the EMA and other statutory instruments that may advocate for less stringent environmental oversight. This conflict is particularly evident in sectors where economic activities, such as mining or industrial manufacturing, are prioritised to stimulate growth. As a result, the EMA can be rendered ineffective in protecting environmental integrity, as industries may circumvent environmental compliance by leveraging economic imperatives.

7.3. The Environmental Management (Air Quality Standards) Regulations 2007

Sections 140, 145, and 230(2)(s) of the Environmental Management Act [Cap. 191] are developed with particular information on air pollution prevention, controls, and reduction by the Environmental Management (Air Quality Standards) Regulations. Section 5(1) of the Environmental Management (Air Quality Criteria) Regulations, 2007 sets ambient air quality criteria. It directs every person to comply with the approved and published minimum air quality standards under section 7(1). Moreover, section 10 prescribes the highest permissible quality of emission. The rules from sections 21 and 25 establish the procedures for measuring and analysing emissions data and the authority of environmental inspectors. The regulations also specify the emissions limitations for mobile sources, stationary sources, and occupational air quality. Regarding the management of gaseous wastes, the law under section 31 states that anyone who disobeys policies or guidelines set forth by a local government body regarding gaseous and particulate wastes commits an offence and faces a maximum fine of five million shillings, a maximum sentence of two years in jail, or both. Furthermore, violating any air quality criteria or a regulation-mandated measure is illegal in any jurisdiction. If found guilty of such an offence, a person faces a minimum fine of five hundred thousand shillings, not exceeding ten million shillings, and a minimum sentence of six months to five years imprisonment prescribed by section 33 of the Act.

However, these penalties may not serve as an effective deterrent due to several factors. First, the enforcement of these penalties can be sporadic and inconsistent. Without a strong enforcement mechanism, these penalties may be perceived as negligible costs of doing business rather than serious repercussions. This perception can encourage industries to prioritise economic gain over regulatory compliance, leading to continuous violations of air quality standards. Moreover, the legal

process required to impose such penalties can be lengthy, potentially allowing offenders to continue their polluting activities before any punishment is applied.

The regulations' schedules outline requirements for various contaminants. Permissible weight concentrations (Emission Limits) from the atmosphere to a receptor are established in the First Schedule and the corresponding test procedures. The maximum allowable quantity (emission) and the test procedures are outlined in the Second Schedule. The Third Schedule sets tolerance limits for airborne emissions of sulphur dioxide, oxides of nitrogen, and inactive dust from cement manufacturers. The regulations' Fourth Schedule establishes the motor vehicle's emission restrictions.

Hence, regulations do not adequately promote public awareness or community engagement in air quality management. A lack of transparency regarding the standards, monitoring results, and enforcement actions can alienate communities from the regulatory process. This disengagement not only reduces public trust but also limits the ability of local residents to hold polluters accountable or advocate for better air quality management in their neighbourhoods. Encouraging public participation and providing access to information could enhance the effectiveness of the regulations by fostering a culture of accountability and collective responsibility toward air quality. Additionally, community involvement could facilitate the identification of specific local air quality concerns that regulatory bodies might overlook.

7.4. Other Laws Governing Industrial Air Pollution

Other laws related to industrial air pollution in Tanzania include the Environmental Management (Biosafety) Regulations, 2009; the Tanzania Investment Act, 1997; the Occupational Safety and Health Act of 2003; The Public Health Act No. 1 of 2009, the Mining Act No. 14 of 2010, the Atomic Energy Act (2002), the Environmental Management (Registration and Practice of Environmental Experts) Regulations, 2021, and the Environmental Management (Biosafety) Regulations, 2009. However, none of them incorporates explicit provisions related to industrial air pollution. They lack integration, creating a fragmented approach to environmental management, leading to potential overlaps or gaps in regulatory oversight. Without a cohesive strategy linking environmental law experts with standards for air quality management, the competencies developed in environmental protection might not align with national priorities for air pollution mitigation or sustainable environmental practices. This disconnect can hinder the effectiveness of environmental assessments, as experts may overlook critical air quality considerations when evaluating projects that could impact the environment. While the Regulations establish a framework for registration and conduct, they fall short of providing robust enforcement and compliance mechanisms. Effective laws and enforcement are essential to ensure environmental standards are practised. The lack of strict oversight may lead to situations where firms or individuals can carry out environmental assessments without adequate scrutiny, resulting in potentially flawed evaluations that do not adequately address air pollution or other critical

environmental factors. This underlines a broader issue: the need for stronger regulatory bodies to monitor compliance and enforce standards set forth in various environmental regulations.

8. China's Legal Framework on Industrial Air Pollution

According to (Cohen & Lange, 1997) China's legal system is organised around written legislation and is theoretically a "civil law" system. The legislation allows the application of the law to international civil relationships, according to Article 142 of the General Principles of Civil Law (Cohen & Lange, 1997). Article 238 of the Civil Procedure Law of 1991 contains similar special provisions on civil procedures involving foreign interests that also apply to the application of international treaties. It states that unless China has specifically stated reservations about a provision, the People's Republic of China's agreement to or accession to any international treaty would precede the terms of this Law. Based on those mentioned above, Chinese courts can immediately utilise international treaties as the legal foundation for rulings in civil matters involving foreign parties. The approach allows Chinese courts latitude in regulating international rules domestically.

8.1. The Constitution of the People's Republic of China 2018

The Constitution governs the legal framework for environmental preservation in the armed forces. Article 26 of the 2018 revised Chinese Constitution mandates that the states safeguard and enhance natural and human environments. It guards against and regulates pollution and other risks to the public. It lays out specific guidelines for bringing the rule of law and ecology together as a significant development symbol. Wide-ranging effects on constitutional ideas, rights, institutions, and their application result from the Constitution's incorporation of ecological civilization (Wang, 2024). In light of these facts, the foundation for developing the ecological civilization legal system is the Constitution's mention of ecological civilization.

8.2. Environmental Protection Law of the People's Republic of China 2014

The 2014 Environmental Protection Law revision carefully changed the laws to promote ecological civilization. Wang (2024) claims that the law was amended to better meet the basic requirements of an ecological society by revising the definition of obligations, the system of supervision and administration, the application's breadth, and the institutional architecture. The goals of the law, as stated in Article 1, are to preserve public health, prevent and control pollution and other public nuisances, protect and enhance the environment, promote ecological civilization, and foster sustainable economic and social development. These goals reflect Article 26 of the Constitution. The foundations of environmental protection are covered in Articles 1, 2, and 7 of the Environmental Protection Law. The Law,

specifically under Article 42, mandates that public institutions, businesses, and other entities that release pollutants must implement strategies to prevent and manage pollution and environmental harm from waste gas and malodorous gases, among other sources.

8.3. The China Pollution Prevention and Control Law 2015

The China Pollution Prevention and Control Law's Article 1 states that the legislation aims to safeguard public health, advance ecological civilization, and support the country's social and economic development. The regulation makes preventing and controlling air pollution caused by industry, coal, cars, boats, dust, and agriculture easier. It also encourages cooperation in the management and avoidance of regional air pollution. Together with greenhouse gases, it also sets up the cooperative regulation of air pollutants like ammonia, particulates, sulphur dioxide, nitrogen oxide, and volatile organic compounds.

In addition, article 7 mandates that businesses, government agencies, and other commercial organisations take proactive steps to stop or lessen air pollution and accept legal liability for any harm they may have caused. According to Article 43, companies involved in the production of steel, building materials, nonferrous metals, petroleum, chemical engineering, and other materials that release dust, sulphide, or nitrogen oxide must use clean production methods and implement dust removal, desulfurization, denitration, and other controls to limit the release of air pollutants.

8.4. The Law on Promoting Clean Production 2012

The Law on Promoting Clean Production was passed to encourage clean production, increase efficiency, decrease and prevent pollution production, safeguard public health, protect and enhance the surroundings, and advance the economy's and society's sustainable growth through Article 1 of the law. According to Article 2, "clean productions" are defined as lowering pollution levels at the source, improving resource efficiency, minimising or avoiding the creation and release of pollutants during the production process, and taking other actions to lessen or completely eradicate the harm done to human and environmental health.

8.5. The China's Energy Conservation Law 2007

The goals of the Energy Conservation Law were to safeguard and improve the environment, encourage comprehensive, integrated, and sustainable economic and social growth, and encourage energy conservation throughout society within Article 1 of the law. Energy conservation is acknowledged by legislation as a fundamental national policy of China. As mandated by Article 4, the State adopts an energy development policy that prioritises conservation over development and considers both simultaneously. It mandates that the State enacts industrial policies beneficial to environmental preservation and energy conservation, limits the growth of industries with high energy consumption and pollution, and promotes

the development of industries that use less energy and are ecologically friendly, as explained by Article 7 of the law.

8.6. The Chinese Criminal Law 1997

The Chinese legal framework contains the penalty for environmental crimes to demonstrate the enforcement intensity of environmental pollution. In that regard, Chinese criminal law has gone far into providing stringent penalties related to adequate protection of the environment against pollution incidents. Chapter VI of the Chinese criminal law under articles 338 - 346 comprises the offences of undermining natural resource protection, which is where China's environmental crime law is anchored. In particular, article 338 stipulates the crime of major pollution incidents where it provides a full description of the incident rate of how the crime of a big pollution incident in Chapter VI is formulated. The stipulated penalties include, among others, ranging from a fine to a sentence of up to ten years fixed-term imprisonment, depending on the circumstances and gravity of the offence in a particular article.

8.7. The Tort Law of the People's Republic of China 2009

In addition, chapter 8 of the Tort Liability Law states unequivocally that a polluter will be held accountable for the pollution they cause. Additionally, the burden of proof in an environmental tort lawsuit will be on the defendant to prove that either the activity was excused by one of several exemptions or mitigations or that the plaintiff's proven damages were not caused by the defendant's acts. In the event of environmental pollution contributed by several polluters, the degree of each polluter's liability will be assessed based on the type of pollutant, amount of emissions, and other relevant considerations. Lastly, the law provides that if a third party is blamed for any injury caused by environmental pollution, the victim may be entitled to compensation from both the polluter and the third party. The third party will be entitled to reimburse the polluter after payment of compensation. As a result, the burden of proof has generally been placed on the defendant in environmental prosecutions.

9. Comparative Evaluation of Air Quality Control Legal Framework: Tanzania and China

In Tanzania, the demand for environmental protection stems from the constitutional right to protect human life. However, the Constitution contains clauses that do not explicitly address environmental management and conservation, but impliedly, they impact those issues. Nevertheless, environmental protection does not have roots in the constitution. The situation can make the judiciary unsure of the legal foundation for this clause in the country's fundamental law. It might not always ensure how a particular judge views the environmental issue.

Tanzania enacted the Environmental Management Act (EMA) to establish the legal foundation for environmentally sustainable management. Under sections 4

(1) and (2), the Act guarantees all Tanzanian citizens a clean, safe, and healthy environment. Every citizen can use public areas for business, recreation, education, health, spirituality, and cultural purposes. On the other hand, The Environmental Management (Air Quality Standards) Regulations sections 145 and 230(2)(s) of the Environmental Management Act [Cap. 191] with specific details on air pollution prevention, controls, and reduction. The regulations set maximum allowable emission quality, direct all parties to adhere to authorised and published minimum air quality standards, and define ambient air quality standards.

Nonetheless, no statute specifically mentions the Paris Agreement's obligations, bearing in mind that it has the most recent international guidelines for industrial carbon emission. The circumstance has legal ramifications for the administration of justice. Instead, the Environmental Management Act adopts a composite stance incorporating environmental protection provisions. The law is the only one which accommodates a series of restrictions and penalties regarding environmental wrongs. In that regard, it addresses matters of general environmental concern (*lex generalis*). The situation, therefore, can make the judges unsure of the legal foundation for this clause in the country's fundamental legislation. In some cases, it may not guarantee the outcome of an individual judge's interpretation of the environmental matter.

Comparatively speaking, China's environmental legal frameworks have advanced significantly by-passing explicit laws that contain clauses prohibiting air pollution by the current approved international agreements. China has laws which explicitly reflect climate change and the Paris Agreement commitments. The legal framework is interlinked and internally coordinated with the Constitutions. The country has incorporated provisions that address specific subject matters in industrial air pollution in the context of the most recent international guidelines on industrial carbon emission.

In particular, a lesson could be drawn from China's legal framework, including the environmental crime penalty. Chapter VI of the Chinese criminal law, in particular, article 338, stipulates the crime of major pollution incidents. The prescribed penalties include, among others, ranging from a fine to a sentence of up to ten years fixed-term imprisonment, depending on the circumstances and gravity of the offence in a particular article. Moreover, chapter 8 of the Tort Liability Law states unequivocally that a polluter will be held accountable for the pollution they cause. The burden of proof in an environmental tort lawsuit will be on the defendant. In that regard, these countries can provide a roadmap for the legal framework, scope, and procedure a domestic regime could take in Tanzania.

10. Comparative Evaluation of Air Quality Control Regulatory Framework: China and Tanzania

The enforcement mechanisms of air quality control regulations are crucial in assessing the efficacy of air pollution management across various nations. In this

context, China far surpasses Tanzania owing to its comprehensive regulatory framework, technical progress, and firm governmental dedication to mitigating air pollution. Tanzania confronts significant challenges stemming from inadequate enforcement capacities and the inefficient application of essential international norms and treaties, hence intensifying its air quality problems.

China significantly escalated its air quality control measures after the announcement of a “war on pollution” in 2013. The nation implemented the Air Pollution Prevention and Control Action Plan, distinguished by explicit emission reduction objectives, financial obligations, and an extensive regulatory framework (Yang, 2024). The implementation of an advanced air quality monitoring system in 2012, which increased from 113 to 335 cities between 2012 and 2014, has markedly enhanced pollution monitoring capabilities (Yang, 2024). This approach improves real-time air quality reporting and reinforces local government accountability, as officials’ promotions are now linked to their environmental performance. Additionally, China’s environmental policies impose severe fines for non-compliance. Local governments are motivated to achieve pollution targets, with non-compliance potentially leading to significant financial penalties and the forfeiture of promotions for local politicians. The use of sophisticated monitoring equipment and rigorous accountability protocols has resulted in significant enhancements in air quality; nationwide PM_{2.5} levels, for example, have decreased by around 40% from 2014 to 2019 (Yang, 2024).

Tanzania’s air quality control enforcement mechanisms are marked by an absence of comprehensive legislative frameworks, deficient monitoring infrastructure, and a lack of political commitment to prioritize air pollution management (United Nation Environment Programme, 2019). Tanzania has several rules for air pollution management, including the National Environmental Policy and the Environmental Management Act of 2004; nevertheless, these laws frequently lack effective enforcement measures to guarantee compliance. A significant issue is that despite Tanzania’s ratification of international treaties designed to regulate air quality, such as the Stockholm Convention on Persistent Organic Pollutants and the Convention on Long-Range Transboundary Air Pollution, the nation has faced challenges in fully incorporating these treaties into its national regulatory framework (United Nation Environment Programme, 2021). The deficiency in authentic enforcement capacity arises from various obstacles, such as low budget, insufficient data collecting, and a widespread lack of understanding about the consequences of air pollution (United Nation Environment Programme, 2019). The government has seen criticism for not fulfilling its obligations under international agreements, chiefly owing to constrained technological skills and a disjointed approach to environmental regulation.

Tanzania has also neglected to implement significant international norms and treaties. Tanzania faces diverse obstacles in the execution of international treaties. Tanzania has inadequately implemented the WHO Air Quality Guidelines, a crucial international norm. Notwithstanding the endorsement of these principles,

Tanzania's air quality standards do not consistently conform to the necessary levels, leading to continuously elevated PM_{2.5} pollution levels. Moreover, the nation is a signatory to the Framework Convention on Climate Change (UNFCCC) and the Paris Agreement; yet, it has encountered difficulties in formulating a comprehensive action plan that corresponds with these obligations. Tanzania's hesitance to establish enforceable domestic legislation aligned with global frameworks diminishes its capacity to effectively combat air pollution ([United Nation Environment Programme, 2021](#)). The absence of a unified approach for enhancing public health via air quality control clearly opposes the goals specified in these treaties, highlighting a substantial compliance deficiency.

Nevertheless, Tanzania's enforcement mechanisms for air quality control are in stark contrast to those of China, as they lack a comprehensive regulatory framework, advanced monitoring technologies, and a strong political commitment to addressing air pollution. Tanzania's inability to commit to the effective implementation of international agreements to enhance its air quality management strategies and protect public health is a result of its fragmented policies and enforcement capabilities, which are exacerbated by a lack of expert monitoring. Tanzania has the potential to improve its air quality control efforts and comply with significant international standards in the near future by implementing targeted reforms and increasing national commitment.

11. Comparative Analysis of Environmental Laws on Industrial Practices and Pollution Levels in China and Tanzania

China's environmental legislation is comprehensive and complex, mostly originating from the Environmental Protection Law established in 2015, which serves as a foundation for pollution regulation across multiple industries. The system encompasses rigorous measures including pollution discharge levies, compulsory emissions reporting, and incentives for cleaner technologies. The government has targeted industrial enhancements and innovation to promote green development, indicating a transition towards sustainable industrial practices.

Tanzania's environmental legislative framework is underdeveloped, notwithstanding recent advancements. The Environmental Management Act of 2004 instituted critical protocols for environmental impact assessments (EIAs) and pollution regulation ([Nations, 2024](#)). Nonetheless, enforcement poses a challenge owing to regulatory deficiencies and constrained resources. Recent restrictions, including the 2019 ban on plastic bags, have aimed to mitigate environmental damage; however, their overall efficacy has been compromised by insufficient compliance and oversight ([Msafiri, 2023](#)).

The implementation of environmental regulations in China has significantly influenced industry practices. The enforcement of stringent restrictions has necessitated substantial investments in greener technologies by numerous polluting companies. The adoption of emission reduction technologies has markedly

diminished sulfur dioxide and particulate matter emissions across many industrial sectors. A 2019 assessment revealed that China's sector accounted for more than 85% of sulfur dioxide emissions; nonetheless, rigorous regulatory control is fostering ongoing improvements and compliance.

In Tanzania, numerous industries continue to function with limited compliance to environmental regulations. The mining sector, which presents considerable environmental issues, is frequently identified as a major source of pollution due to inadequate regulation and enforcement. Tanzanian legislation mandates Environmental Impact Assessments (EIAs) for all significant projects; nevertheless, the execution and adherence to these evaluations are variable, mostly due to corruption and insufficient capacity within regulatory bodies. In areas such as the Tanzanian Central Zone, where mining operations are prevalent, industrial pollution levels are very high, highlighting the necessity for enhanced regulatory frameworks and oversight (Bank, 2019).

China has faced significant air and water pollution issues as a result of its fast development. Reports suggest that, notwithstanding legislative advancements, air quality in industrialized areas frequently surpasses acceptable worldwide limits, resulting in various health problems for residents (Cohen & Lange, 1997). Nonetheless, strengthened rules and more public awareness have resulted in a significant reduction of PM2.5 levels in key cities such as Beijing, demonstrating the tangible effects of new regulatory measures (Cohen & Lange, 1997).

Tanzania confronts substantial issues regarding pollution, largely associated with agricultural activities, deforestation, and insufficient waste management. Concerns regarding waste disposal and water source pollution are among the most significant environmental issues recognized by the populace. A substantial segment of the public claims that pollution constitutes a major issue in their localities. The effects of environmental legislation on industrial pollution levels in both nations can be seen through individual data points. In 2020, the percentage of organizations adhering to environmental regulations in China increased markedly, with estimates indicating compliance levels between 60% - 70% for medium to big enterprises. Conversely, compliance rates in Tanzania are significantly lower, with numerous enterprises functioning without proper environmental permits or evaluations. Furthermore, although China's initiatives have led to enhanced air quality metrics, Tanzania's pollution levels persist at elevated rates, reflecting inadequate enforcement and insufficient public investment in environmental management. Industrial pollution in Tanzania is directly associated with elevated emissions in regions with insufficient regulatory control, resulting in significant repercussions for local ecosystems and public health (Bank, 2019).

12. Enforcement Challenges of Industrial Air Pollution in Tanzania and China

Tanzania has a legislative system designed to address environmental contamination, including the National Environmental Policy (1997) and the Environmental

Management Act (2004). Nonetheless, the implementation of this legal framework is deficient due to constrained financial and technical resources, in addition to inadequate coordination among different governmental bodies. The Urban Environment Management division, responsible for enforcing environmental regulations, is hindered by insufficient staffing and training to adequately monitor industrial emissions. This leads to an absence of regular compliance assessments. As a result, industries frequently function without permits or neglect to comply with emission limits, leading to substantial degradation of air quality. Compounding the issue, local authorities may favor commercial incentives at the expense of environmental considerations, resulting in regulatory oversight and inadequate enforcement measures.

Urbanization in Tanzania poses further issues for air quality control, especially in prominent cities such as Dar es Salaam. The swift industrialization and urban expansion in these regions have led to increased emissions from vehicular traffic, industrial operations, and inadequately managed trash, intensifying air pollution levels. Moreover, significant metropolitan centers frequently lack the requisite data for an evidence based approach to air quality challenges, so impairing the capacity to develop effective policies. The economic burden of pollution, expected to exceed \$28 billion from premature fatalities caused by pollution-related diseases, has been documented. Notwithstanding the presence of multiple policies designed to tackle these issues, a substantial disparity persists between legislation and practical implementation, underscoring the critical necessity for enhanced enforcement mechanisms.

China has a more extensive legislative framework for environmental protection but encounters obstacles due to its dual governance system. Recent changes in environmental governance have implemented “campaign-style” enforcement, characterized by temporary, intensive crackdowns on polluters in conjunction with conventional regulatory measures. This dual strategy, although seemingly advantageous, creates inconsistency and unpredictability in environmental enforcement, leading to confusion among firms attempting to adjust to variable requirements. The Chinese government has advanced in implementing stricter emission rules and enhancing oversight of companies that contribute to air pollution. Nonetheless, collaborative frameworks among municipal authorities typically fail, as the demands of economic expansion often eclipse environmental conservation efforts. This is seen in the how local governments promote industrial development to the detriment of regulatory adherence, so further compromising China’s initiatives to enhance air quality.

The decentralized government structure in Tanzania hinders accountability and coordination among environmental authorities, hindering effective regulation enforcement. This decentralized structure impedes swift responses essential for effective pollution management, particularly in urban centers experiencing unsustainable growth, whereas China’s centralized yet dualistic governance leads to both rigorous regulations and inconsistent enforcement practices, fostering an

environment of uncertainty for industries. The dependence on short-term evaluations and inconsistent legislation presents hazards for compliance and long-term environmental sustainability.

13. Findings

This part describes the findings related to the comparative assessment of environmental legislation on industrial air pollution in Tanzania and China. Therefore, in the course of the evaluation, the following appear to be the findings:

13.1. Conformity with the International Agreement on Industrial Decarbonization

Tanzania has passed several legislations about environmental management and protection. The primary legislative framework comprises the Environmental Management Act 2004 and the Environmental Management (Air Quality Standards) Regulations 2007. Despite being the most current international accord with guidelines on industrial carbon output, the Paris Accord is scarcely addressed in the environmental legislation. Furthermore, Tanzania's Constitution makes no explicit reference to the rights to an environment that is safe for one's health or well-being or to maintain the environment for the benefit of current and future generations. On the other hand, Article 27(1) of the Constitution states that everyone is accountable for safeguarding the nation's natural resources. In this regard, the Constitution lacks a strong foundation for environmental protection. However, the Environmental Management Act's sections 4(1) and (2) guarantee all Tanzanian citizens a clean, safe, and healthy environment. The Act takes a multifaceted approach and includes several environmental protection measures. The law is the only one which accommodates a series of restrictions and penalties regarding environmental wrongs. In that regard, it addresses matters of general environmental concern (*lex generalis*). The situation, therefore, can make the judges unsure of the legal foundation for this clause in the country's fundamental legislation. It might not always ensure how a particular judge views the environmental issue.

Relatively, the environmental legal frameworks of China have gone far beyond by enacting clear statutes that express provisions related to the prohibition of air pollution in line with the current ratified international agreements. Regardless of their differences in legal systems, China has laws that explicitly reflect the commitments of the Paris Agreement. The country has incorporated provisions which address specific subject matters in the context of the Paris Agreement. Moreover, a legal concern to protect future generations through safeguarding the environment is highly reflected in the constitution and specific laws.

According to Article 26 of the Chinese Constitution, the government protects and improves the natural and human surroundings. It protects the public from pollution and other hazards by regulating them. Articles 1, 2, and 7 of the Environmental Protection Law focus on environmental protection to protect public

health, prevent and regulate pollution, and manage other risks to the public. The China Pollution Prevention and Control Law's Article 1 aims to prevent and control air pollution, protect public health, promote ecological civilization, and support the country's economy and society's sustainable progress. Above all, Article 1 of the Law on Promoting Clean Production was passed to decrease and prevent pollution production, safeguard public health, protect and enhance the environment, and advance the economy's and society's sustainable growth.

Furthermore, as the "basic law norms" for environmental protection, their legal frameworks are connected to and internally coordinated with the Constitutions. They incorporate environmental protection provisions from treaties into the constitution to guarantee that the nation's international commitments are carried out. In that sense, these nations can offer Tanzania a road map for the legal system and the extent and process a domestic government might adopt.

13.2. Managing Industrial Air Pollution in line with International Environmental Standards

According to the report, Tanzania's current legislative framework does not meet the Paris Agreement's requirements for a precise target or tight emissions trajectory. Furthermore, it does not sufficiently address the pressing need to reduce emissions. Tanzania's legal system does not expressly mention Article 2(1) (a) of the Paris Agreement, which attempts to keep global average temperature increases below 2°C over pre-industrial levels and to pursue measures to reduce the increases to 1.5°C above pre-industrial levels. The conditions have legal implications for the administration of justice. It is believed that in this situation, the proverb *sic utere tuo et alienum non-leads* (using one property not to the disadvantage of another) applies. The responsibility to stop environmental harm comes before the Rio Declaration. States must safeguard each other's rights, as stated in the Trail Smelter report (Trail Smelter, 1972) and the related case (United States v. Canada, 1941) which International law states that a state may not use its territory or permit others to use it in a way that could release fumes that could harm persons or property on the territory of another party, even in cases of grave consequence where the harm is demonstrated by clear and convincing evidence.

According to the 1949 Corfu Channel Case United Kingdom of Great Britain and Northern Ireland v. Albania, Albania was bound by several general and widely acknowledged rules on this score. Every state must stop acts that violate the rights of other States from occurring on its soil. Based on the transboundary harm criterion that the Court established, some academics (Horbach & P Bekker, 2003) contend that the ICJ had made observations pertinent to transboundary environmental issues as early as 1949, even though there was no environmental disagreement in the Corfu Channel Case.

Judge Weeramantry, for example, points out in his dissenting opinion that the Corfu Channel case established the crucial environmental principle: as the Nuclear Tests case (New Zealand v France, 1974) demonstrated, a country will be

held accountable for the harm it causes if it knows facts that it chooses not to disclose and that country knows that facts could harm another country. Judge Weeramantry requests an analysis of the circumstances under paragraph 63 of the Court's order on December 20, 1974, addressing the nuclear tests. Therefore, for protectionist environmental laws and policies to be relevant under the existing regime, the meaning of using one's property in a way that does not harm another has enormous significance. The economic effects of environmental issues, first raised by the Trail Smelter Arbitration and now included in the environmental regime as a requirement, are notable due to how domestic laws have applied them and the respect they have received from the judiciary.

13.3. Enforcement of Adherence to International Guidelines on Industrial Carbon Emission

The study has revealed that Tanzanian regulations fall short of what is needed to guarantee a decrease in greenhouse gas emissions or to hold responsible people who make major contributions to escalating the effects of climate change. Section 31 of the Environmental Management (Air Quality Standards) Regulations, 2007 states that anyone who violates the regulations or guidelines issued by a local government body concerning gaseous constitutes a crime and can be fined up to five million shillings, sentenced to up to two years in jail, or both. Furthermore, section 33 provided a minimum punishment of 500,000 shillings, a maximum fine of ten million shillings, and a minimum penalty of six months to five years in jail, imposed upon conviction for breaking any air quality standards or a regulation-mandated action. In that situation, it is important to remember that protecting industrial pollution necessitates better and more robust collaboration among all parties involved. The present sanctions are insufficient and will not make non-compliance disappear. The amount of the punishment (fine) is inadequate to act as a strong enough deterrent.

In that case, all parties are committed, under international law through The Paris Agreement Article 4(2), to pursue domestic mitigating measures to accomplish the goals of their nationally specified contributions. As a result, the Agreement requires all parties to act and imposes obligatory procedural obligations on them. In particular, a lesson could be drawn from China's legal framework, including the environmental crime penalty. Chapter VI of the Chinese criminal law, in particular, article 338, stipulates the crime of major pollution incidents. The prescribed penalties include, among others, ranging from a fine to a sentence of up to ten years fixed-term imprisonment, depending on the circumstances and gravity of the offence in a particular article. On the other hand, chapter 8 of the Tort Liability Law states unequivocally that a polluter will be held accountable for the pollution they cause. The burden of proof in an environmental tort lawsuit will be on the defendant.

14. Conclusion

The paper's findings attest to Tanzania's government's ratification of several

multinational accords about industrial air pollution. The environmental laws do not, however, specifically address the terms of the Paris Agreement. Furthermore, the study has shown that Tanzania's Constitution does not express the right to a safe environment for one's health or well-being nor the right to protect the environment for the benefit of present and future generations. Rather, the Environmental Management Act takes a hybrid approach that includes several environmental protection measures. In this sense, the law covers general environmental concerns (*lex generalis*). Comparatively speaking, a few chosen nations' environmental laws have gone above and beyond by-passing explicit laws that contain clauses prohibiting air pollution by recently agreed international agreements.

According to the study, Tanzania's legal framework does not sufficiently address the pressing need to control emissions and a precise target and stringent emissions trajectory based on the most recent international standards on industrial carbon emissions, such as the Paris Agreement. According to the study, Tanzania's policies are insufficient to ensure a reduction in greenhouse gas emissions or to hold accountable those who significantly contribute to the worsening of the surroundings. Therefore, to grant Tanzania's ratified treaties legal standing within the country, domestication of international environmental law treaties is required.

15. Recommendations

Tanzania's industrial air pollution problem is complex and necessitates extensive legal changes. The threats to the environment and human health associated with air pollution have significantly increased as the nation rapidly industrializes. Building on the philosophical underpinning of the study, which is "one's land not to be detrimental to another", coupled with the knowledge that the goal of the law is to achieve justice, there is a need for a due process of law in the management of industrial air pollution. The fact that law is a dynamic social phenomenon has led to various interpretations. In this regard, giving treaties legal standing within national borders depends on domesticating international environmental law. Therefore, Tanzania should adopt measures to accord with international norms and successfully mitigate industrial air pollution as follows:

a) Strengthening Regulatory Frameworks

Tanzania's existing legal framework for air quality management is inconsistent and often under-enforced, a reality that stifles accountability and hampers effective pollution control. Key reforms should aim to enhance the comprehensiveness and enforceability of current regulations. This could include the establishment of a robust set of Ambient Air Quality Standards (AAQS) that align with international benchmarks, particularly those set by the World Health Organization (WHO) (Bishop, 2021). Specifically, Tanzania should adopt stricter limits for common air pollutants like particulate matter (PM), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). Setting legally binding emission limits will not only facilitate monitoring but also hold industries responsible for compliance.

b) Establishing Stronger Monitoring and Enforcement Mechanisms

To effectively enforce air quality regulations, Tanzania needs to invest in robust monitoring systems that are properly funded and equipped. Currently, the monitoring of air quality is insufficient, with many areas lacking adequate assessment tools. The establishment of real-time air quality monitoring stations across urban and industrial areas is essential for timely data collection. Moreover, the National Environmental Management Council (NEMC) must be empowered with greater authority and resources to conduct inspections, enforce compliance, and implement penalties for violations. This would create a more transparent and accountable regulatory environment.

c) Integration of Public Health Considerations

Furthermore, Tanzania should integrate public health concerns directly into its environmental legislation, particularly through the National Health Policy. This policy should explicitly recognize air quality as a critical determinant of health and outline measures to protect vulnerable populations from the health impacts of air pollution. Legal provisions could facilitate public health assessments in industrial areas and require industries to provide data on emissions and health impacts, thereby fostering greater accountability.

d) Promoting Stakeholder Engagement and Transparency

Legal reforms should also involve enhancing stakeholder engagement, whereby community voices are included in decision-making processes related to industrial emissions. Establishing frameworks for public participation in environmental assessments and the development of pollution control measures will lead to broader community support and compliance. By mandating industries to disclose information about their emissions and the potential health impacts on local populations, Tanzania can promote greater transparency and community oversight.

e) Development of a Comprehensive Pollution Prevention Strategy

Tanzania requires a cohesive pollution prevention strategy that combines regulatory measures with financial incentives for cleaner technologies (Tanzania, 2019). These incentives can include tax breaks or grants for industries that invest in pollution control technologies, such as scrubbers or filters, which could significantly reduce emissions of harmful pollutants. Moreover, fostering collaboration with international partners to access advanced pollution control technologies and funding could further boost efforts to improve air quality.

Therefore, by implementing these recommendations, Tanzania can better meet international standards, protect public health, and create a healthier environment for all its citizens. The necessity for swift and decisive action cannot be overstated, as the detrimental impacts of industrial pollution continue to challenge the nation's development trajectory and public health initiatives. With a commitment to these legal reforms, Tanzania can pave the way for a sustainable industrial future that prioritizes environmental and public health.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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