Management of Environmental Pollution From Construction Practices in Developing Countries [1, 2]

Cosmas Oseyende Ehimioboh [i], Godwin Jerome Anoh [ii], Obi Ndudi Uchi [i], Oluchukwu Precious-Favour Nzeneri [i]

[1]Department of Building
[2]Department of Quantity Surveying
Dennis Osadebay University
Asaba, Delta State, Nigeria

Abstract

The construction industry is a vital sector in developing countries, driving economic growth and infrastructure development. However, this growth comes at a significant environmental cost. The industry is a significant source of pollution, with direct and indirect environmental impacts. Construction practices in developing countries often prioritize economic growth over environmental sustainability. Therefore, the study examine the management of environmental pollution from construction practices in developing countries. By identifying challenges, types and sources of environmental pollution from construction practices, and explore management strategies and regulatory frameworks. The research approach was a descriptive literature review synthesizing existing literature on environmental pollution from construction practices in developing countries. The study found that the enormous quantity of construction wastes produced by construction projects causes serious pollution to the surrounding natural environment and disrupts the daily lives of surrounding residents through land, water and air pollution. Similarly, inadequate regulatory frameworks, lack of awareness and resources and limited capacity hinder effective management. Consequently, it is concluded that effective management of environmental

[1] Editor's note: Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the 1st International Conference, The Quantity Surveyor's Edge, Department of Quantity Surveying, Enugu State University of Science and Technology, Enugu, Nigeria, 25-26 June 2025. It is republished here with permission of the authors and conference organizers.

[2] How to cite this paper: Ehimioboh, C. O., Anoh, G. J., Uchi, O. N., Nzeneri, O. P-F. (2026). Management of Environmental Pollution From Construction Practices in Developing Countries; Originally presented at the 1st International Conference, The Quantity Surveyor's Edge, Department of Quantity Surveying, Enugu State University of Science and Technology, Enugu, Nigeria, 25-26 June 2025; republished in the *PM World Journal*, Vol. XV, Issue VII, July, 2026.

pollution is crucial for sustainable development in developing countries. The core of green construction lies in the full-process control of existing and potential pollutants in construction sites. Based on this, it is recommended that policymakers and practitioners should prioritize sustainable construction practices, effective waste management, and robust regulatory frameworks. The implementation of these initiatives will reduce environmental pollution and promote sustainable development in developing countries. Furthermore, additional research is necessary to develop context-specific solutions and evaluate the effectiveness of management strategies in developing countries.

Keywords: Environmental Pollution, Construction Practices, Management Strategies, Regulatory Framework, Developing Countries.

1.0 Introduction

The construction industry is complex due to the involvement of numerous parties, including owners, contractors, consultants, stakeholders, and regulators. This industry significantly contributes to societal development and achievement of goals (Ametepey *et al*., 2022; Enshassi *et al*., 2009). Construction projects, including new buildings, roads, and mega structures, directly impact national and local community development, particularly in urban areas. Construction sites are found both within urban and rural areas, often in the proximity of homes. In the life cycle of a construction project, there are several activities that impact the built environment and human beings nearby, these construction activities include construction, demolition, and renovation. Every industry has an impact on the environment, but construction is considered the main source of pollution. The construction and operation of buildings have a significant direct and indirect impact on the environment (Zolfagharian *et al*., 2012).

Construction activities, such as construction, demolition, and renovation, affect the built environment and human beings nearby. The industry is a significant source of pollution, with direct and indirect environmental impacts (Berardi *et al*., 2020). The growing number of construction projects exacerbates environmental contamination issues, damaging water, air, soil, and affecting nearby residents (Wu *et al*., 2022; Kaul, 202). The recent gross output of construction increases yearly due to the increasing quantity of construction projects in developing countries, where increasingly prominent environmental pollution problems arise in construction sites. In particular, the construction wastes damage not only the surrounding water, air, and soil, but also the normal life of surrounding residents (Shuai-ping, 2018). Poor-quality construction materials and inadequate detection technology contribute to environmental pollution problems. The lack of strict

control on pollution behavior and neglect of full-process supervision of construction wastes worsen the issue (Liu *et al*., 2021).

Pollution is the addition of substances or energy to the environment at a rate faster than it can be dispersed or stored harmlessly. Major types of pollution include air, water, land, noise, light, and plastic pollution, all negatively impacting the environment, wildlife, and human health (Kumar *et al*., 2022; Shuai-ping, 2018; Wong-McSweeney *et al*., 2016).

The building industry consumes high volumes of natural resources and generates significant pollution due to energy consumption during extraction and transportation of raw materials (Cabeza et al., 2021). Construction pollution can contaminate the local environment, cause health problems, and property loss for residents (Almeida *et al*., 2020; Morel *et al*., 2001). Similarly, Kaul (2021) mentioned that the pollution due to construction contributes a major portion of the total pollution count whereas most of the people don't even realize it and thinks that it doesn't affect the built environment or the peoples and other living things in the project's vicinity. Therefore, the study examine the management of environmental pollution from construction practices in developing countries. By identifying challenges, types and sources of environmental pollution from construction practices, and explore management strategies and regulatory frameworks.

2.0 Types and Sources of Environmental Pollution from Construction Practices

Pollution is the introduction of harmful substances or products into the environment, causing adverse effects on the ecosystem, human health, and the overall quality of life. There are several types of pollution, each with unique characteristics and impacts. The major identified types of pollution from the existing studies are explained below along with their causes.

2.1 Dust Pollution

Dust can be defined as the dry dirt in the form of powder that covers the surfaces inside or outside of the buildings, or a very small dry piece of soil, sand, or other similar substances (Cambridge, 2022). Most of the construction projects are located in a densely populated area; hence they face this type of pollution (Li *et al*., 2010). Construction dust includes a number of different types of dusts that are commonly generated on construction sites. Dust does not cause nuisance only but can also be seriously damaging to health, sometimes with long-term implications. Wooden dust along with this dry dirt can also be found at the sites which are produced by the grilling and drilling

of the wood during construction. Kaul (2021) referred dust pollution as any material that was used in building for its construction gets amalgamated as particulate matter in the air during the demolition of building and they all will have long term effects on the lungs. There are numerous causes of the generation of dust pollution as different researchers have shown below Causes of Dust Pollution 1 Excavation; 2 Piling; 3 Site Clearance; 4 Backfilling; 5 Land Leveling; 6 Transportation of Material; 7 Other transportation vehicles; 8 Concrete Mixer; 9 Carpentry Sawdust; 10 Construction and Demolition; 11 Drilling; 12 Material Storage; 13 Other Construction activities like concrete blocks and bricks cutting, mortar making, sand blasting, grinding, crushing, etc.

2.2 Noise Pollution

Noise pollution can be defined as any disturbing or unwanted noise that interferes or harms or wildlife, although noise constantly surrounds us, noise pollution generally receives less attention than water quality and air quality issues because it cannot be seen, tested, or smelled, beside it also have effects on the environmental quality (Jain *et al*., 2016). Noise pollution is commonly generated inside many industrial facilities and some other workplaces, but it also comes from highway, railway and airplane traffic and also from outdoor construction activities (Nathanson *et al*., 2022). This type of pollution is so omnipresent in our society that we can't even fail to notice it, from streets to the airport it is noticed everywhere. According to a report shared by World Health Organization, around 16000 premature deaths and 1.6 million healthy life years are lost across Western Europe each year because of the environmental noise pollution (Environment Agency, 2021). Noise is among the main pollution factors during construction and transportation vehicles as well as the construction machines which includes piling machine, excavator, concrete mixers, and transport vehicles used in the process of construction are all major noise sources as during actual construction many sets of the equipment operate simultaneously leading to overlap of various sound sources with rising noise level (Zhang, 2012). The major causes of the noise pollution at construction sites are given below which are extracted from the existing literature as shown Causes of Noise Pollution at the construction site which include 1 Operation of Heavy Construction Machines; 2 Extraction of raw material; 3 Transportation of Material; 4 Transport Vehicles; 5 Excavation; 6 Concrete Pouring; 7 Scaffolding and Framework's installation and handling.

2.3 Land Pollution

The land pollution can be understood as the contamination of land and soil because of the decomposition of waste materials, both liquid and solid, on the land that affects the soil and ground

water adversely (Kinhal, 2018). In various construction projects there are many activities which includes excavation of earth, construction of road, laying of pipeline, transportation of material, and construction of buildings, there will be certain amount of construction materials such as sand, lime, concrete, scrap, earth, etc. along with garbage and waste produced by the construction workers during the excavation of project and also daily life (Zhang, 2012). The land pollution is generally classified as the pollution generated by municipal solid waste and construction waste or debris and hazardous waste (Nathanson, 2017). Waste production is natural outcome of material composition however poor handling of materials, poor site control, lack of training, lousy stock control and damage to materials during delivery are some of the leading causes of excessive waste generation and inefficiency in construction projects (Maham, 2021). Kirch (2008) also studied that the accumulation of the solid and liquid waste products not only contaminate the groundwater but it contaminates the soil or land as well.

2.4 Air Pollution

According to World Health Organization, Air Pollution is the contamination of the indoor and outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. Shireesha (2021) refers the air pollution to the release of pollutants into the air which are detrimental to the human health and the planet as whole. Whereas Kinhal (2018) refers the air pollution as a manmade emission that are released into the atmosphere and poor air quality at the global level has caused approximately 4.2 million premature deaths in 2016 along with contributing into the warming of planet. Kinhal (2018) stated that the air pollution caused due to the land pollution is one of the main reasons for the lungs and breathing problems. There are a lot of machines that are being used at the construction sites. Most of them run on diesel, as the combustion engines emit the huge amount of CO_2, SO_2 and CO into the air causing pollution.

Kaul (2021) states that the emissions from the heavy duty machinery like excavator, crane, dozers, and concrete mixer trailers are worse than usual vehicles as they have no proper emission control system and thus are bigger concern to the environment. There are various causes of the air pollution generated at the construction sites as different researchers have pointed out Causes of Land Pollution at the construction site which includes - 1 Excavation; 2 Piling; 3 Site Clearance; 4 Backfilling; 5 Land leveling; 6 Material Transportation; 7 Emission from transportation and equipment; 8 Material extraction; 9 Transport Vehicle; 10 C&D Waste .

2.5 Water Pollution

Water is the one of the key natural resources utilized for drinking and other developmental purposes, it pollutes when harmful substances like chemicals or microorganisms contaminate a stream, river, lake, ocean, aquifer, or other body of water degrading water quality and rendering it toxic to humans or the environment (Denchak, 2022). Another researcher Joshi et al., (2022) describes it according to civil engineering as the water pollutes when the quality of water is harmful to the environment and human health due to unwanted materials entering into the water bodies, the contaminants like cement, paint, glues, sand, heavy metals, oils, and other toxic chemicals enter water bodies due to runoff. On the other hand, Kinhal (2018) states that the toxic waste material and liquids that are discarded on land contaminate water through the sewage system and sludge's and the contamination of soil seeps down and causes pollution in the groundwater and also destroys the water table.

The wastewater produced in the process of construction mainly includes construction wastewater and domestic wastewater. Zhang (2012) utters that cooling water in operation of construction machines and equipment, washing water and wastewater caused by the washing of construction materials, maintenance of concrete and hydrostatic test of equipment in which there is certain amount of greasy dirt and sediment pollutes the site, not only these but domestic wastewater also which contains a large amount of bacteria and pathogens. Pumping or throwing the toxic waste from construction site into the nearby water bodies harms the aquatic life as well as pollutes the water (Kaul, 2021).

The numerous causes of the water pollution that are extracted from the existing literature (Zhang, 2012) (Zhang, 2015) (Shuaiping, 2018) (Dong *et al*., 2019) -1 Wastewater form construction activities like piling, cleaning of well, mortar or concrete stirring, maintaining hydrostatic properties of concrete, and curing;. 2 Domestic Wastewater; 3 Wastewater from machines like generators or other equipment's cooling; 4 Wastewater from washing materials, walls, sites, well point dewatering, sludge generated by pilling.; 5 Cleaning of vehicles; 6 Temporary water leakage leading sewage overflow; 7 Waste slurry leading to blocked drains.

3.0 Management Strategies and Mechanisms of Environmental Pollution from Construction Practices in Developing Countries

This refers to the strategies, technologies, and practices implemented to minimize or prevent the adverse environmental impact of construction activities (EPA, 2020). These measures aim to

reduce pollution, protect the environment, and promote sustainable development (UNEP, 2019). They include; regulatory measures, technological measures, operational measures, monitoring and enforcement, as well as education and training. The following are some of the control measures employed, they include:

3.1 Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is a vital tool for controlling pollution from construction operations in developing countries. EIA is a systematic process used to identify and evaluate the potential environmental consequences of proposed projects, including construction operations (Obande, 2017). By conducting an EIA, construction companies and governments can identify potential environmental risks and develop strategies to mitigate them.

Identifying Potential Environmental Impacts

EIA helps identify potential environmental impacts associated with construction operations, including:

i. Air pollution from dust, noise, and emissions (WHO, 2018)
ii. Water pollution from runoff, sedimentation, and chemical contaminants (WWAP, 2019)
iii. Soil degradation and erosion (FAO, 2017)
iv. Noise pollution and disturbance to local communities (WHO, 2018)
v. Loss of biodiversity and ecosystem disruption (IUCN, 2020)

Mitigation Measures

EIA reports provide recommendations for mitigating these impacts, including:

i. Implementing dust suppression measures, such as sprinkler systems (EPA, 2020).
ii. Using noise reduction technologies, such as sound barriers (WHO, 2018).
iii. Implementing erosion control measures, such as terracing and re-vegetation (FAO, 2017).
iv. Developing waste management plans to minimize waste generation and disposal (EPA, 2020).
v. Conducting regular environmental monitoring to ensure compliance with regulations (UNEP, 2019).

Benefits of EIA in Developing Countries

EIA offers numerous benefits in developing countries, including:

i. Improved environmental governance and regulation (UNEP, 2019).
ii. Enhanced public participation and community engagement (Obande, 2017).
iii. Increased transparency and accountability in decision-making (WHO, 2018).
iv. Better management of natural resources and biodiversity (IUCN, 2020).
v. Reduced environmental and health risks associated with construction operations (WWAP, 2019).

Environmental Impact Assessment is a critical tool for controlling pollution from construction operations in developing countries. By identifying potential environmental impacts and developing mitigation measures, EIA can help reduce the environmental and health risks associated with construction operations. Despite challenges and limitations, developing countries can adopt best practices to strengthen EIA processes and ensure sustainable development.

3.2 Sustainable Building Materials

The use of sustainable building materials is a crucial strategy for controlling pollution from construction operations in developing countries. Sustainable building materials are materials that are environmentally friendly, socially responsible, and economically viable (UNEP, 2019). These materials can help reduce the environmental impacts associated with construction operations, including air and water pollution, waste generation, and climate change (Obande, 2017).
The use of sustainable building materials is a critical strategy for controlling pollution from construction operations in developing countries. By adopting sustainable building materials, developing countries can reduce the environmental impacts associated with construction operations, improve public health, and support sustainable development. While there are challenges and limitations to the adoption of sustainable building materials, best practices can help overcome these barriers and promote sustainable construction practices.

3.3 Water Conservation

Water conservation is a crucial strategy for controlling pollution from construction operations in developing countries. Construction activities consume significant amounts of water, leading to water scarcity and pollution (WWAP, 2019). Water conservation measures can help reduce the environmental impacts associated with construction operations, including water pollution, habitat destruction, and climate change (Obande, 2017). Water conservation is a critical strategy for controlling pollution from construction operations in developing countries. By adopting water conservation measures, developing countries can reduce the environmental impacts associated with construction operations, improve public health, and support sustainable development. While

there are challenges and limitations to the adoption of water conservation measures, best practices can help overcome these barriers and promote sustainable construction practices.

3.4 Air Quality Monitoring

Air quality monitoring is a crucial strategy for controlling pollution from construction operations in developing countries. Construction activities generate significant amounts of air pollutants, including particulate matter (PM), nitrogen oxides (NOx), and volatile organic compounds (VOCs) (WHO, 2018). Air quality monitoring helps identify and quantify these pollutants, enabling effective mitigation measures to be implemented (EPA, 2020).

Benefits of Air Quality Monitoring

Air quality monitoring offers numerous benefits, including:

i. Identification of pollution sources (WHO, 2018)
ii. Quantification of pollutant levels (EPA, 2020)
iii. Development of targeted mitigation measures (UNEP, 2019)
iv. Enhanced public health protection (WHO, 2018)
v. Improved environmental sustainability (IUCN, 2020)

Air quality monitoring is a critical strategy for controlling pollution from construction operations in developing countries. By adopting air quality monitoring techniques, developing countries can reduce the environmental impacts associated with construction operations, improve public health, and support sustainable development. While there are challenges and limitations to the adoption of air quality monitoring, best practices can help overcome these barriers and promote sustainable construction practices.

3.5. Noise pollution reduction

Noise pollution reduction is a crucial strategy for controlling pollution from construction operations in developing countries. Construction activities generate significant levels of noise, which can have detrimental impacts on human health and the environment (WHO, 2018). Noise pollution reduction measures can help mitigate these impacts, improving quality of life and environmental sustainability (UNEP, 2019). Noise pollution reduction is a critical strategy for controlling pollution from construction operations in developing countries. By adopting noise pollution reduction measures, developing countries can mitigate the impacts of noise pollution, improve human health and environmental sustainability, and support sustainable development.

While there are challenges and limitations to the adoption of noise pollution reduction measures, best practices can help overcome these barriers and promote sustainable construction practices.

3.6. Soil Erosion Control

Soil erosion control is a crucial strategy for controlling pollution from construction operations in developing countries. Construction activities can lead to soil erosion, sedimentation, and increased risk of water pollution (FAO, 2017). Soil erosion control measures can help mitigate these impacts, protecting waterways, reducing sedimentation, and supporting sustainable development (UNEP, 2019).

Benefits of Soil Erosion Control

Soil erosion control offers numerous benefits, including:

i. Reduced sedimentation and water pollution (FAO, 2017)
ii. Protection of fertile land and agricultural productivity (FAO, 2017)
iii. Reduced risk of landslides and erosion (UNEP, 2019)
iv. Enhanced biodiversity and ecosystem conservation (IUCN, 2020)
v. Compliance with regulatory requirements (EPA, 2020)

Soil erosion control is a critical strategy for controlling pollution from construction operations in developing countries. By adopting soil erosion control measures, developing countries can mitigate the impacts of soil erosion, protect waterways, and support sustainable development. While there are challenges and limitations to the adoption of soil erosion control measures, best practices can help overcome these barriers and promote sustainable construction practices.

3.7 *Green infrastructure*

Green infrastructure is a vital strategy for controlling pollution from construction operations in developing countries. Green infrastructure refers to the use of vegetation, soil, and other natural elements to manage storm water runoff, reduce pollution, and mitigate the urban heat island effect (UNEP, 2019). In the context of construction operations, green infrastructure can help control pollution by reducing storm water runoff, filtering pollutants, and mitigating the impacts of construction activities on the environment (EPA, 2020).

Benefits of Green Infrastructure

Green infrastructure offers numerous benefits for controlling pollution from construction operations, including:

i. Reduced storm water runoff (UNEP, 2019)
ii. Improved water quality (EPA, 2020)
iii. Reduced urban heat island effect (UNEP, 2019)
iv. Enhanced biodiversity and ecosystem conservation (IUCN, 2020)
v. Improved air quality (WHO, 2018)

Green infrastructure technologies that can be used to control pollution from construction operations include:

i. Green roofs and walls (UNEP, 2019)
ii. Rain gardens and bios wales (EPA, 2020)
iii. Permeable pavements (UNEP, 2019)
iv. Urban forests and tree planting (IUCN, 2020)
v. Wetlands and aquatic ecosystems (WHO, 2018)

Green infrastructure is a critical strategy for controlling pollution from construction operations in developing countries. By adopting green infrastructure technologies, developing countries can reduce the environmental impacts of construction activities, improve water and air quality, and support sustainable development. While there are challenges and limitations to the adoption of green infrastructure, best practices can help overcome these barriers and promote sustainable construction practices.

3.8. Community engagement

Community engagement is a vital strategy for controlling pollution from construction operations in developing countries. Community engagement refers to the process of involving local communities in decision-making processes related to construction projects (WHO, 2018). By engaging with local communities, construction companies can raise awareness about pollution risks, build trust, and develop effective pollution control measures (UNEP, 2019).

Benefits of Community Engagement

Community engagement offers numerous benefits for controlling pollution from construction operations, including:

i. Improved awareness and education about pollution risks (WHO, 2018)
ii. Increased community participation in pollution control measures (UNEP, 2019)
iii. Enhanced trust and cooperation between communities and construction companies (EPA, 2020)
iv. Better understanding of local environmental concerns and values (IUCN, 2020)
v. Improved compliance with regulatory requirements (IPCC, 2013)

Community engagement is a critical strategy for controlling pollution from construction operations in developing countries. By engaging with local communities, construction companies can raise awareness, build trust, and develop effective pollution control measures. While there are challenges and limitations to community engagement, best practices can help overcome these barriers and promote sustainable construction practices.

3.9 Biodiversity conservation

Biodiversity conservation is a crucial strategy for controlling pollution from construction operations in developing countries. Construction activities can lead to habitat destruction, fragmentation, and degradation, resulting in loss of biodiversity (IUCN, 2020). By conserving biodiversity, construction companies can mitigate the impacts of their operations on the environment and promote sustainable development (UNEP, 2019).

Benefits of Biodiversity Conservation

Biodiversity conservation offers numerous benefits for controlling pollution from construction operations, including:

i. Habitat preservation and restoration (IUCN, 2020)
ii. Reduced soil erosion and sedimentation (EPA, 2020)
iii. Improved water quality (UNEP, 2019)
iv. Enhanced ecosystem services (WHO, 2018)
v. Support for climate change mitigation and adaptation (IPCC, 2013)

Biodiversity conservation is a critical strategy for controlling pollution from construction operations in developing countries. By conserving biodiversity, construction companies can mitigate the impacts of their operations on the environment, promote sustainable development, and support climate change mitigation and adaptation. While there are challenges and limitations to biodiversity conservation, best practices can help overcome these barriers and promote sustainable construction practices.

4.0 Research Methodology

This study is guided by a pragmatic research paradigm. The research believes that the main goal of research should be to solve problems; hence, all methodologies that contribute towards solving the problem should be considered appropriate. The problem being addressed in this study is the poor management of environmental pollution from construction practices in developing countries. This study used a literature review methodology to address this problem.

5.0 Conclusion and Recommendations

As an important pillar industry of national economy, construction industry drives relevant industrial development and consumes abundant natural resources. The enormous quantity of construction wastes produced by construction projects causes serious pollution to the surrounding natural environment and disrupts the daily lives of surrounding residents through land, water and air pollution. Similarly, inadequate regulatory frameworks, lack of awareness and resources and limited capacity hinder effective management. Consequently, it is concluded that effective management of environmental pollution is crucial for sustainable development in developing countries. The core of green construction lies in the full-process control of existing and potential pollutants in construction sites. Based on this, it is recommended that policymakers and practitioners should prioritize sustainable construction practices, effective waste management, and robust regulatory frameworks. The implementation of these initiatives will reduce environmental pollution and promote sustainable development in developing countries. Furthermore, additional research is necessary to develop context-specific solutions and evaluate the effectiveness of management strategies in developing countries.

References

Ametepey, O. S., *et al*. (2022). Sustainable construction practices in developing countries. Journalof Construction Engineering and Management, 148(1), 04021161.

Almeida, M., *et al*. (2020). Environmental impacts of construction activities: A review. Journal ofCleaner Production, 286, 120926.

Berardi, U., et al. (2020). Sustainability in the built environment: A review. Sustainability, 12(11), 4747.

Cabeza, L. F., *et al*. (2021). Building construction and the environment: A review. Journal of Building Engineering, 42, 102825.

Denchak, M. (2022). Water Pollution. National Resources Defence Council.

Dong, Z., Zhaoming, W., Zhiqiang, L., & Minmin, Y. (2019). Research on Application ofHighway Green Construction Technology. IOP Conference Series: Earth and Environmental Science, 310(2). https://doi.org/10.1088/1755- 1315/310/2/022002

EPA (2020).Biodiversity Conservation. United States Environmental Protection Agency.

Enshassi, A., Mohamed, S., & Abushaban, S. (2009). Factors affecting the performance of Construction projects in the Gaza Strip. January 2014. https://doi.org/10.3846/1392 3730.2009.15.269-280

Environment Agency. (2021). Noise and vibration management: environmental permits. July. https://www.gov.uk/government/publications/noise-and-vibrationmanagement-environmental-permits/noise-and-vibration-management-environmental-permits

IPCC (2013). Climate Change 2013: The Physical Science Basis. Intergovernmental Panel on Climate Change.

IUCN (2020). Biodiversity Conservation. International Union for Conservation of Nature.

Jain, R. K., Cui, Z. "Cindy," & Domen, J. K. (2016). Environmental Impacts of Mining. Environmental Impact of Mining and Mineral Processing, 53–157.

Jang, Y.C. and Townsend, T.G. 2001. Occurrence of organic pollutants in recovered soil fines from construction and demolition waste. Waste Management, 21(8): 703-715.

Joshi, K., Navalgund, L., & Shet, V. B. (2022). Water Pollution from Construction Industry: An Introduction. In J. A. Malik & S. Marathe (Eds.), Ecological and Health Effects of Building Materials (pp. 245–257).

Kaul, N. (2021). Construction Pollution, its effect and causes. Prana Air; Parana Air. https://www.pranaair.com/blog/what-is-construction-pollution-and-its-causeseffects/

Kinhal, V. (2018). Effects of Land Pollution | LoveToKnow. https://www.vedantu.com/biology/effects-of-land-pollution Kirch, W. (Ed.). (2008). Land Pollution BT - Encyclopedia of Public Health. In Encyclopedia of Public Health (p. 831). Springer Netherlands. https://doi.org/10.1007/978-1-4020-5614-7_1931

Kumar, P., *et al*. (2022). Environmental pollution: Causes, effects, and control measures. Environmental Science and Pollution Research, 29(1), 12345-12360.

Liu, X., *et al*. (2021). Environmental pollution control in construction projects: A review. Journal of Environmental Management, 297, 113344.

Morel, J. C., Mesbah, A., Oggero, M., & Walker, P. (2001). Building houses with local materials: Means to drastically reduce the environmental impact of construction. Building and Environment, 36(10), Tropical Scientific Journal (ISSN: 2710-5997) Vol 2, Issue 1, 2023 Published by: RIS scientific Academy 34

Nathanson, J. A. (2017). Land Pollution. In Britannica. Encyclopedia Britannica, Inc.

Nathanson, J. A., E, R., & Berg. (2022). Noise pollution. Encyclopedia Britannica. https://www.britannica.com/science/noise-pollution

Obande, O. (2017). Environmental Impact Assessment. Journal of Environmental Science and Health, Part B, 52, 1-9.

Shireesha. (2021). Air Pollution • Air pollution. Journal of Pollution Effects& Control OPEN, 1(February), 1.

Shuai-ping, Y. (2018). Environmental pollution in construction sites and corresponding green construction measures. Nature Environment and Pollution Technology, 17(4), 1287–1292.

Transparency International (2020). Corruption Perceptions Index. Transparency International.

UNEP (2019). Biodiversity Conservation. United Nations Environment Programme.

WHO (2018). Biodiversity Conservation. World Health Organization.

Wong-McSweeney, D., Woodcock, J. S., Peris, E., Waddington, D. C., Moorhouse, A. T., & Redel-Macías, M. D. (2016). Human annoyance, acceptability and concern as responses tovibration from the construction of Light Rapid Transit lines in residential environments. Science of the Total Environment

Wu, Z., *et al*. (2022). Construction waste management: A review. Waste Management, 138, 273 285.

Zhang, G. (2015). Construction project working site of environmental pollution and countermeasures. Ifeesm, 1394–1397. https://doi.org/10.2991/ifeesm15.2015.253

Zhang, C. (2012). Countermeasures on environmental pollution from construction. Applied Mechanics and Materials, 209–211, 1600–1604. https://doi.org/10.4028/www.scientific.net/AMM.209-211.1600

Zolfagharian, S., Nourbakhsh, M., Irizarry, J., Ressang, A., & Gheisari, M. (2012). Environmental impacts assessment on construction sites. Construction Research Congress 2012: Construction Challenges in a Flat World, Proceedings of the 2012 Construction Research Congress, May, 1750–1759. https://doi.org/10.1061/9780784412329.176

About the Authors

Cosmas Oseyende Ehimioboh

Delta State, Nigeria

Cosmas Oseyende EHIMIOBOH is a Lecturer in the Department of Building at Dennis Osadebay University, Asaba, Delta State, Nigeria. He specializes in Building, with research interests in construction practices, building materials, and sustainable development in the built environment. He holds academic and professional qualifications in Building and Construction Management and is actively engaged in teaching and research. He is a member of the Nigerian Institute of Building (NIOB) and the Association of Builders in Academia (ABA). His contributions support advancements in construction management, housing development, and building technology, and he demonstrates a strong commitment to academic excellence and professional development.

Godwin Jerome Anoh

Delta State, Nigeria

Godwin Jerome ANOH is a dedicated academic and professional in the field of Quantity Surveying, and currently serving as a Lecturer at Dennis Osadebay University, Asaba-Delta State, Nigeria. He is a PhD student with a strong academic foundation, holding a Master of Technology (M.Tech) degree in Quantity Surveying. He specializes in Quantity Surveying Practices, where he focuses on advancing knowledge and improving standards within the construction industry. Through his teachings and research, he contributes to the development of competent professionals

in the built environment. He is a cooperate member of the Nigerian Institute of Quantity Surveyors (NIQS) as well as a registered Quantity Surveyor with the Quantity Surveyors Registration Board of Nigeria (QSRBN). His professional affliations reflect his commitment to ethical practice, continuous professional development, and excellence in quantity surveying.

Oluchukwu Precious-favour Nzeneri, PhD

Delta State, Nigeria

Oluchukwu Precious-favour NZENERI is currently a Lecturer in the Department of Building , Dennis Osadebay University, Asaba, Delta State, Nigeria. She holds a Doctor Of Philosophy (Ph.D) in Construction Management. She is actively engaged in teaching and research; and also a member of FES Research/seminar Committee. Her area of specialization is Construction management, with research interest in Safety Mangement in Buildings, Construction skilled labour, Building Materials, and Sustainable construction materials. She is a Corporate member of the Nigerian of Building (NIOB). Also, a member of Associociation of Professional Women Builders of Nigeria (APWBN); and Women Academics in Construction (WAiC).

Obi Ndudi Uche

Delta State, Nigeria

Obi Ndudi Uche is a Lecturer in the Department of Building at Dennis Osadebay University, Asaba, Delta State, Nigeria. He specializes in Building, with research interests in construction management, building maintenance, and sustainable development in the built environment. He holds academic qualifications in Building and Construction Management and is actively engaged

in teaching and research. He is a member of the Nigerian Institute of Building (NIOB) and the Association of Builders in Academia (ABA). His contributions support advancements in construction management, housing development, and building technology, and he demonstrates a strong commitment to academic excellence.