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IMPACT OF BUILDING CONSTRUCTION ACTIVITIES ON THE ENVIRONMENT IN NIGERIA

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***Abstract**:*

One of the economic areas that significantly contributes to Nigeria's economic development is the building industry. Compared to other businesses, the construction sector produces a notable number of pollutants, such as noise, solid waste, air emissions, and water discharge, because of its numerous significant energy- and non-renewable resource-consuming operations. Therefore, if insufficient mitigation measures are implemented, environmental effect may arise at any point during the development of a property, from building to occupation. Therefore, it is impossible to ignore the detrimental effects that construction operations have had on the ecosystem. The purpose of this study is to assess the current state of environmental impact of construction activities by looking into the causes and effects of these activities as well as finding ways to improve them. The ultimate goal is to influence the formulation of environmental policies that will be sustainable for Nigeria's construction industry. The study conducted interviews, conducted questionnaire surveys, and reviewed pertinent literature. In essence, the noise, air, and water pollution are the main environmental impacts under evaluation.

***Keyword**: activities, building construction, effects, environment, evaluation*

1.0 Introduction

One of the areas that significantly contributes to Nigeria's economic development is the building and construction industry. As a result, the industry has experienced significant mass construction development in recent years, which has increased demand to offset the nation's housing deficit. As a result, the effects of building operations on the environment are now recognised on a global scale, and many nations have passed laws requiring the assessment of these effects (Cole, 2000; Teixeira, 2005; Tam et al., 2006; Ofori et al., 2009). Environmental issues are therefore becoming a concern for almost all parties involved in the construction industry as a result of these extensive building construction activities. Despite extensive research, the relationship between construction activities and the environment is only now becoming recognised as a strategically significant issue in developing nations. Hence, this trending situation is not different from what is obtainable in a developing country like Nigeria.

Plessis (2002) observes that sustainable construction in emerging nations tends to focus on the relationship between construction and human development, often side-lining the environmental implication aspect of the scenario expressed above. According to Schaefer (2004), in an effort to promote sustainable development and construction, builders and other related professionals in the built environment frequently disregard the site as a minor component that need not be carefully studied. This suggests that the protection of the environment and the natural habitat, which are essential for the sustainability of the ozone layer, are being sacrificed on the altar of risky physical development that is intended to advance economic gain that provide short-term satisfaction to all in a short amount of time.

The building sector is significantly contributing to climate change, pollution, and energy crises, thus requiring a rapid shift to more sustainable construction practices and building industry will always have an effect on the physical environment as long as it needs resources from the environment (Chen et al., 2024). As anticipated, the combination of these significant environmental factors and the quickening rate of population expansion will have detrimental effects on natural resources (Ofori et al., 2009, Ebohon and Rwelamila, 2001). Due to the significant detrimental effects that resource-intensive housing and infrastructure development have had on the natural environment and understanding that the construction sector has the potential to significantly contribute to environmental sustainability, given the immense pressure it places on natural resources worldwide, is the driving force behind the transition towards sustainable construction.

The tendency to want to fill the entire land while unintentionally harming the preexisting natural green system is present most of the time while buildings are being erected. As a result of creating ditches and trenches, which is brought on by the removal of topsoil, this may essentially result in soil compaction, which could lead to the loss or harm of native flora that grows on the site (Teixeira, 2005; Uher, 2019). On construction sites, vegetation is a natural aspect of the urban landscape that must be protected (Esin and Cosgun, 2007; Teixeira, 2005). This is because preserving vegetation is linked to serious concerns for the environment and the people who live there. Therefore, in general, a lack of environmental management in the construction process is not noticed during the building's life span (Cole, 2000). This is because the perceived relatively lower significance of construction impacts compared with the lifecycle impacts associated with building design and management, as well as the inherent temporality related to the on-site construction, are the reasons for the limited attention given to the impacts of on-site construction.

The construction industry's daily raw material use is growing environmental consequences and carbon emissions throughout our natural environment leading to the depletion of natural resources. Numerous studies by Salam et al. (2020), Gottlieb et al. (2023), Kim and Junghans (2023) have demonstrated the seriousness of the environmental effects generated by construction operations and the need for control. The state's capital now has a strong demand for business and residential space due to the influx of more immigrants and investors. As a result, numerous residential, commercial, and industrial buildings have appeared and are still appearing. The production of toxic wastes and other harmful substances employed in construction operations had been acknowledged as major contributors to pollution of the air, water, and land (Pasquire, 1999).

As a result, in order to ensure that construction projects have the least negative effects on the environment possible, it is necessary to identify potential environmental impacts and rank them according to severity. This is the reason that this study aims to investigate the environmental effects of building construction activities in order to expand our understanding and shape the foundation for developing sustainable environmental policies for the sector.

The aim of this study is to evaluate the effects of building construction activities on the environment in Nigeria with a view of minimizing the negative impact it has on the environment are to evaluate the level of awareness of impact of construction activities in construction industry, to examine the effects of construction activities on the environment and people in the study area and to proffer solutions to adverse effects of construction activities on the environment and people in the study area.

2.0 Literature review

Environmental integrity is altered by the construction industry's extensive range of off-site, on-site, and operational operations, all of which have a substantial, permanent impact on the environment (Uher, 1999). According to Levin (1997) Buildings have a significant role in the degradation of the environment. Several studies (Hill & Bowen, 1997; Barret et al., 1999; Cole, 1999; Holmes & Hudson, 2000; Morel et al., 2001; Scheuer et al., 2003) action is obviously required to improve the sustainability of the built environment and building operations. Thus, it may be necessary to consider a "cradle to grave" perspective when analysing how construction activities affect the environment (Ofori et al., 2000). One of the biggest users of natural resources, both renewable and non-renewable, is the building sector (Spence & Mulligan, 1995; Curwell & Cooper, 1998; Uher, 1999). For the provision of raw resources like wood, sand, and aggregates for the construction process, it mostly depends on the natural environment. Building construction uses 25% of virgin timber and 40% of the world's raw materials for sand, gravel and stones annually, according to World Watch Institute (2003).

Additionally, it uses 16% of water and 40% of energy per year. Approximately 50% of the material turnover in the European construction sector is driven by society at large (Rohracher, 2001), whereas in Sweden the percentage is 44% (Sterner, 2002). From an ecological and aesthetic perspective, the natural environment of rural and coastal areas is irreversibly altered by the extraction of natural resources (Curwell & Cooper, 1998; Ofori & Chan, 1998; Langford et al., 1999). The ensuing relocation of these regions into widely separated locations results in increased energy consumption as well as an increase in particulate matter in the environment. The extraction of raw materials and building operations also add to the buildup of pollutants in the environment. Levin (1997) states that in the United States, building accounts for 13% of other releases, 20% of water effluents, and 40% of air emissions. Nitrogen and sulphur oxides are among the hazardous compounds found in dust and other emissions (Cheng et al., 2023).

These hazardous compounds pose major threat to the environment and are emitted during the manufacture, transportation, and site activities of various activities (Spence & Mulligan, 1995; Ofori & Chan, 1998; Rohracher, 2001). Other hazardous substances that have significantly damaged the ozone layer are chlorofluorocarbons (CFCs), which are used in insulation, air conditioning, refrigeration facilities, and firefighting systems (Clough, 1994; Langford et al., 1999). Additionally, pollutants have been released into the biosphere, leading to significant contamination of land and water. This has frequently happened as a result of on-site negligence that led to hazardous spills that were subsequently washed into reservoirs and subterranean aquatic systems (Kein et al., 1999). About one-third of the world's land is being degraded, and pollutants are lowering environmental quality and interfering with the environment's ability to support a naturally balanced ecosystem, according to Langford et al. (1999).

The massive consumption of a wide range plastic products has generated a huge amount of plastic waste, most of the manufacturing, shipping, and use of goods generate a significant amount of waste and fashion industries that produces fabrics for laboratory coat generates substantial materials waste that requires urgent efforts to manage effectively, reduce environmental impact, and foster sustainable practices. (Akter et al., 2022; Evode, 2023; Ofori & Chan, 1998; Kein et al., 1999).

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Notably, building accounts for about 29% of trash in the United States, over 50% in the United Kingdom, and 20–30% in Australia (Teo & Loosemore, 2001). In the United States, building accounts for 25% of the output of solid waste, according to Levin (1997). About 40–50% of garbage generated annually in the European Union comes from the building sector (Sjostrom & Bakens, 1999; Sterner, 2002). Most trash generated during construction is needless (Sterner, 2002). He continued by saying there is a lot of material that can be recycled and used again when it comes to building and demolition. However, the process of sorting, examining, and managing construction waste for recycling takes time, and the lack of environmental consciousness among building industry professionals may seriously limit the benefits of recycling (Langston & Ding, 1997).

The building industry's depletion of natural resources is a topic of serious controversy because the majority of recyclable material from construction sites ends up in landfills. According to Sterner (2002), putting in place a waste management plan throughout the planning and design phases can save up to 50% on trash handling costs and reduce waste on-site by 15%. In addition to producing garbage, construction projects permanently convert agricultural land into structures like highways, bridges, dams, and other civil engineering undertakings (Spence & Mulligan, 1995; Langford et al., 1999; Uher, 1999). Between 1980 and 1990, over 7% of the world's agriculture was lost, according to Langford et al. (1999).

Additionally, the mining and quarrying of raw materials for construction results in the loss of arable land. Because timber is needed for construction and to provide energy for the production of building materials, construction also plays a role in the disappearance of forests. Air pollution and global warming are directly caused by both deforestation and the use of fossil fuels. Furthermore, the building sector is thought to be a large energy consumer, and using limited fossil fuel resources for this reason has increased carbon dioxide emissions dramatically (Clough, 1994; Spence & Mulligan, 1995; Ofori & Chan, 1998; Langford et al., Uher, 1999). Approximately 40% of all energy produced in Europe has gone towards construction (Sjostrom & Bakens, 1999; Rohracher, 2001; Sterner, 2002).

2.1 Effects of construction industry to the environment

While the building industry plays a vital role in the overall socio-economic development of any nation, it also consumes a large amount of natural, non-renewable resources and pollutes the environment. Protectionism and environmental awareness are growing, particularly in wealthy nations. The Nigerian government understood that the building sector is critical to the nation's economic development as it is a developing nation. According to the Construction Industry Development Board (CIDB, 2011), the sector has continuously contributed between 8% and 16% of the country's GDP during the past 20 years. But there are flaws in the sector as well. Productivity, quality, safety, technology, ineffective methods, and environmental effects have all presented challenges.

The building industry will need to adapt due to the need to preserve the environment through the widespread use of renewable energy sources, biodegradable materials, composites, recycling, and waste material reuse, as well as climatic changes and resource depletion. Nigeria's progress towards becoming a developed nation by 2020 has not been immune to environmental issues. One of the obstacles to sustainability is a lack of understanding of the principles of sustainable development (Azapagic, 2003).

2.2 Evaluation of environment impacts from construction activities

During construction, activities including site preparation (grading and

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clearing), facility construction (building pipelines, transmission lines and geothermal power plants), and vehicle and pedestrian traffic are all potential sources of environmental impact. The extraction of natural resources like minerals and fossil fuels; increased use of general resources like land, water, air, and energy; creation of waste that necessitates the use of land for disposal; and contamination of the living environment with noise, odours, dust, vibrations, chemical and particle emissions, and solid and sanitary waste are the categories Shen and Tam (2002) used to categorise the environmental impacts of construction.

2.2.1 Noise

Noise is unwanted, irritating, and destructive sound. Although sound by itself is not polluting, it can irritate a recipient when it invades their personal space. A listener can hear noise via a number of channels (Harris, 2019). In addition, it was discovered that the main cause of noise at building sites was tools and equipment (Sinclaire and Haflidson, 2015). In many building sites, trucks or other heavy vehicles, machinery, and excavation equipment are frequently used. Examples include excavators, bulldozers, concrete mixers, air compressors, and hand-held breakers. As with any roadworks, there will be more noise at the project site and along the pipeline route as a result of construction activity. Hundreds of thousands of construction workers are at risk of hearing impairment and hypertension due to occupational exposure to excessive noise levels from cars, tools, and equipment. Noise-induced hearing damage is the most common irreversible occupational hazard in the construction sector; 120 million persons worldwide are thought to have experienced hearing loss as a result of noise. Employees in the construction sector are especially vulnerable.

Humans can be impacted by noise pollution in a number of ways, including hearing loss, heart problems, sleep disorders, verbal communication disruption, and mental health issues. One of the body's most important organs, the ear, can suffer harm from noise exposure. Noise pollution can cause temporary or permanent hearing impairment. An environment with excessive noise may contribute to heart-related issues. High decibel sound has been linked to a sharp increase in blood pressure, according to studies, since it narrows blood vessels and interferes with blood flow. The quantity of heart beats per minute, or heart rate, likewise rises. In the long term, there is a higher chance of cardiovascular illnesses due to these abrupt irregular blood changes. Loud noise exposure might increase stress levels and incite violent behaviour. Constant noise can also cause headaches, tense, worried, and upset people's emotional equilibrium. All contractors will be expected to supply operational machinery and equipment with noise-suppression devices comparable to original equipment in order to prevent excessive noise levels. Since the construction will only take place during the day, noise levels at night shouldn't be impacted.

2.2.2 Air

The term "air pollution" typically refers to contamination of the atmosphere, where the majority of pollutants have a variable half-life before being carried away by precipitation, changing through reactions, or falling to the ground (Petts, 2014). The term "particulate matter" refers to the quantity of these potentially dangerous material particles in the air expressed as a percentage. This defines polluted air. It has one or more contaminants, pollutants, or hazardous substances in it that could be harmful to people's health in general. PM10, which is undetectable to the unaided eye, is the classification for construction dust. Vehicle and heavy equipment diesel engine exhausts are a significant additional source of PM10 on construction sites. The term diesel particulate

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matter (DPM) refers to this mixture of silicates, sulphates, and soot that easily combines with other airborne contaminants to increase the health hazards associated with particle inhalation. In addition, diesel is the source of emissions of nitrogen oxides, hydrocarbons, and carbon monoxide.

Clearing and grading land, running diesel engines, demolition, handling hazardous materials, building pipeline systems and power plants, and building gearbox lines are some of the construction activities that cause air pollution. Significant air pollution can result from fires on disposal facilities and the open burning of garbage. Dioxins, one of the most harmful combustion byproducts, can lead to sickness and reduce vision, making disposal sites unstable and unsafe. Can explosions could also result from it, and they might spread to nearby properties. Air pollution is also a result of the toxic fumes released by oils, glues, thinners, paints, treated wood, plastics, cleansers and other often used hazardous chemicals on building sites. During the construction phase, emissions are produced by construction equipment and vehicle exhaust, fugitive dust from paved and unpaved roads, and the production of vapours from geothermal fluids, which contain carbon dioxide, hydrogen sulphide, mercury, arsenic, and boron.

Every construction site produces a lot of dust, which can travel great distances for extended periods of time. This dust is usually produced by concrete, cement, wood, stone, and silica. Regardless of the quality of the air around them, humans are forced to breathe it. Numerous short- and long-term health impacts of air pollution are possible. When the air is contaminated, those who already have health issues like asthma, heart disease, or lung illness may also suffer more. People who breathe in ozone, dust, and toxic gases might suffer from lung and heart problems as well as general health problems when their air is polluted. Breathing difficulties, headaches, chest tightness, coughing, burning eyes, and wheezing can all be brought on by short-term air pollution. It's also deemed hazardous to breathe in trace amounts of air pollution over an extended period of time. It might potentially be a factor in fatal illnesses.

2.2.3 Water

Water is a crucial component in the building sector and it could be transported in from off-site, acquired from neighbouring municipal sources or groundwater wells, depending on availability (Nallaperuma et al., 2023; Mannan and Al-Ghamdi, 2020). Numerous causes, such as industrial processes, landfills, and building activities, can contaminate water. Water would be needed during the construction phase to manage dust, which would make concrete and the workers' consumptive usage of it. In the building site, muddy water and bentonite slurries may result from excavation and piling operations. Construction projects have the potential to degrade runoff water quality by introducing contaminants into nearby rivers and storm drain systems. The construction of roads, well pads, and power plants can generate ground disturbing activities that enhance soil erosion and surface runoff, therefore the effects on water resources during this period would make sense.

Water contamination on construction sites can be caused by many substances such as paint, solvents, oil, diesel, soil, and other hazardous compounds. A supply of drinking water for people, groundwater, can get contaminated by pollutants from building projects. Groundwater is far more difficult to treat once contaminated than surface water (Elumalai et al. 2020; Wang et al. 2020; Su et al. 2020). Water sources can become seriously contaminated by contaminated water that leaks from disposal facilities and trash dumps. Chemical wastes can contaminate large areas of water supplies and can be lethal or cause severe harm if swallowed, inhaled, or touched. Human health risks associated with water pollution include cancer, hormonal imbalances that can interfere with reproduction and development, harm to the brain system, liver, kidneys, and DNA. In addition, the deposition of air pollutants like acid rain and interactions between water and contaminated soil can lead to water contamination.

3.0 Methodology

The goal of this is to collect pertinent data for the study; the target demographic or groups of respondents required for sufficient data for the study include the study area's residents, construction workers, and related professionals. Seventy (70) questionnaires were distributed for the purpose of this study. The responders who can read and write were given the questionnaires by hand. Additionally, focus groups with pertinent stakeholders in the study area were held to gather their opinions regarding the study's focus; however, only fifty-seven (57) equivalent to (81.43%) responses were obtained. This is because some respondents were not interested in filling out the questionnaire, and others could not be retrieved because of their own negligence. The analysis tools included both descriptive and inferential statistics and its analysis was done using computer based Statistical Package for Social Sciences (SPSS). Data were obtained from both the primary and secondary sources which include interview, questionnaire, textbooks, journal publications and internet.

The relative significance index ranking (RSI) method was used for ranking of the factors studied. Bakhray (2008) gave an equation that could be useful for determining Relative Significance Index (RSI) in prevalence data as:

$$\text{MIT} = \frac{\sum \mu}{\text{AN}} \quad (0 \le x \le 5)$$

Where MIT is mean item scores

μ is the weighting given to each factor by respondents;

A is the highest weight (i.e. 5 in this case);

N is the total number of respondents

4.0 DATA ANALYSIS AND RESULTS

The data were presented using tables for clarification and better interpretation collected from the questionnaires administered.

Table 1: Professional background of respondents

Profession	Frequency	Percentage (%)
Architect	4	7.00
Structural Engineer	13	22.80
Mechanical	5	8.80
Electrical	5	8.80
Builder	18	31.6
Quantity Surveyor	1	1.80
Others	11	1.93
Total	**57**	**100**

Source: Fieldwork, 2024

Table 1 above shows the professional distribution of the respondents. Over 31% of the respondents are Builders which accounts for majority of the respondents, over 22% of the respondents are structural engineers, over 8% of the respondent accounts for mechanical engineers and electrical engineers respectively and 7% accounts for architects and 19% accounts for other professionals in the construction industry.

Table 2: Academic qualification of respondents.

Qualification	Frequency	Percentage %
HND/BEng/BSc/BTech	51	89.47
M.Eng/M.Sc/M.Tech	4	7.02
PhD	2	3. 51
Total	**57**	**100**

Source: Fieldwork, 2024

Table 2 above shows the academic qualification of the respondents. Majority of the respondents are HND/BEng/BSc/BTech degree holders which represents over 89.47% of the respondents, while over 7.02% of the respondents represent M.Eng/M.Sc/M.Tech degree holders and 3.51% of the respondents PhD holders.

Table 3: Years of existence of the organization

Year of existence	Frequency	Percentage %
Less than 5yrs	12	21.10
5-10yrs	20	35.10
11- 15yrs	12	21.10
16- 20yrs	4	7.00
21- 25yrs	1	1.80
26- 30yrs	3	5.30
31yrs and above	5	8.80
Total	**57**	**100.00**

Source: Fieldwork, 2024

Table 3 above show the years of existences of the respondents' organization. 35% of the organizations have existed for 5-10 years which accounted for majority of the respondents. 21% have existed for less than 5 years and 11-15 years respectively. 8% of the organizations have existed for above 31 years, 7% have existed for 16-20 years and only 1.8% have existed for 21-25 years respectively.

Table 4: Awareness of the impacts of building construction activities on the built environment

S/N	Impacts	Mean	Std. Deviation	Ranking
1	Timber consumption	3.88	1.129	1st
2	Water consumption	3.86	.972	2nd
3	Increase in population	3.82	1.136	3rd
4	Noise and vibration generation	3.81	1.093	4th
5	Waste generation	3.74	1.110	5th
6	Air pollution	3.74	1.061	6th
7	Vegetation removal	3.70	.944	7th
8	Dust generation from machinery	3.68	1.121	8th
9	Consumption of electricity	3.63	1.190	9th
10	Land use change	3.58	1.101	10th
11	Increase in transport need	3.58	1.164	11th
12	Fuel consumption	3.57	1.219	12th
13	Health risk on work site	3.57	1.076	13th
14	Extreme consumption of raw materials	3.53	1.104	14th
15	Waste water generation	3.53	1.071	15th
16	Landfill wastes	3.52	1.062	16th
17	Emissions of greenhouse gases	3.48	1.144	17th
18	Water pollution	3.43	1.234	18th
19	Interference with the ecosystem	3.42	1.051	19th
20	Increase in temperature	3.40	1.132	20th
21	Climate change	3.39	1.130	21st

Source: Fieldwork, 2024

Table 4 above shows the level of awareness of the respondents to the impacts of construction activities on the environment. From the mean value obtained from the analysis, it shows that all the respondents are aware of the impacts of construction activities on the environment, although they are not very much aware of this impact. This indicates that, the respondents do not have very strong knowledge of this impact on the environment. The table also shows the ranking for how much awareness the respondents have on the impacts of construction activities on the environment and it indicates that, the respondents are more aware of some impacts that the other. From the table, the awareness of timber consumption as an impact on construction activity is ranked higher, followed by water consumption, followed by increase in population, followed by noise and vibration generation, followed by waste generation and climate change is ranked least aware.

Table 5: Rate of consideration of the impacts of construction activities on the environment

S/N	Impacts	Mean	Std. Deviation	Ranking
1	Waste generation	3.77	1.018	1st
2	Timber consumption	3.75	1.123	2nd
3	Fuel consumption	3.67	1.170	3rd
4	Vegetation removal	3.67	1.075	4th
5	Water consumption	3.65	1.110	5th
6	Air pollution	3.63	1.071	6th
7	Land use change	3.61	1.031	7th
8	Consumption of electricity	3.54	1.206	8th
9	Noise and vibration generation	3.51	1.151	9th
10	Interference with the ecosystem	3.50	.984	10th
11	Extreme consumption of raw materials	3.49	.947	11th
12	Health risk on work site	3.47	1.311	12th
13	Increase in transport need	3.47	1.324	13th
14	Dust generation from machinery	3.46	1.103	14th
15	Water pollution	3.39	1.186	15th
16	Landfill wastes	3.35	1.094	16th
17	Waste water generation	3.33	1.230	17th
18	Increase in population	3.30	1.267	18th
19	Climate change	3.25	1.379	19th
20	Emissions of greenhouse gases	3.19	1.076	20th
21	Increase in temperature	3.09	1.100	21st

Source: Fieldwork, 2024

Table 5 above shows the rate of consideration of the impacts of construction activities on the environment. The mean values from the analysis shows that the respondents are on the agreeing side of the impacts of construction activities on the environment. However, they do not strongly agree to this impacts on the environment. This indicates that this impacts are not strongly perceived to affect the environment. The table also shows the ranking for the rate of consideration of this impacts on environment and it indicates that waste generation was ranked higher in the consideration as impact of construction activities on the environment, followed by timber consumption, followed by fuel consumption, followed by vegetation removal and increase in temperature is ranked the least considered impact on the environment.

Table 6: Methods for controlling impacts of building construction activities on the environment.

S/N	Methods of control	Mean	Std. Deviation	Ranking
1	Upgrading skills	4.02	1.009	1st
2	Avoid toxic materials and systems	4.00	1.052	2nd
3	Innovation	3.93	1.100	3rd
4	Reducing material wastage	3.86	1.125	4th
5	Reuse and recycling	3.84	1.082	5th
6	Identification of authorized person on site	3.79	1.048	6th
7	Improving energy efficiency	3.75	1.090	7th
8	Complying to emission standards	3.70	1.085	8th
9	Use renewable resources	3.70	1.143	9th
10	Increase structure service life	3.68	1.256	10th
11	Minimize dust generating activities	3.68	1.198	11th
12	Increase use of recycled waste	3.63	1.234	12th
13	Dust monitors across site	3.61	1.161	13th
14	Reduce embodied energy	3.53	1.120	14th
15	Avoid site runoff and mud	3.51	1.002	15th
16	Waste covering	3.51	1.071	16th
17	Use water as duct suppressant	3.33	1.155	17th

Source: Fieldwork, 2024

Table 6 above shows the rate of consideration of the methods for controlling impacts of building construction activities on the environment. From the mean value obtained from the analysis, it shows that "upgrading skills", "Avoid toxic materials and system"," innovation "and "reducing material wastage "have been ranked in the first, second, third and fourth as a proposed solution to mitigate the environmental impact of construction.

5.0 Conclusion and recommendation

5.1 Conclusion

Building development projects pose an increasing hazard to the environment, necessitating radical mitigation strategies in all aspects. However, depending on the nation, different building construction activities may have different environmental effects. According to the study, the biggest environmental effects are pollution, resource depletion, and habitat destruction, which are brought on by desertification, the eradication of vegetation, waste disposal, soil erosion, and material waste.

5.2 Recommendations

In order to contribute to reduce the adverse impacts of construction projects on the environment, the following recommendations should be considered:

i. There should be adequate knowledge and awareness of construction participants with regard to environmental impacts of construction.

ii. The decision makers should take adequate measures to protect labours and residents who are living close to construction projects.

iii. The government should enhance legislations to attempt curbing the adverse impacts of constructions.

iv. The government should enact strict laws to prevent establishing concrete materials factories in the urban cities, and oblige the involved people to establish it out of the cities.

v. The researchers should look for alternative friendly materials instead of concrete construction and alternative methods for construction to mitigate the adverse impacts of construction on the environment.

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