

EXAMINATION OF THE VARIABLES USED IN VALUING CONTAMINATED AGRICULTURAL LANDS IN SOUTH-SOUTH GEOPOLITICAL REGION, NIGERIA

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Abstract

Real estate comprises land and structures which are regarded as assets that confer wealth and socio-political influence on the owner; hence the motivation for its acquisition. This domain encompasses diverse dimensions, with varying quantities and types of factors impacting its value. Within the valuation process lies, among other considerations, identified factors which influence real estate value. This paper is aimed at examining the variables used in the valuation of contaminated agricultural lands in South-South, Nigeria, with a view to assessing their relevance as determinants of value of contaminated land in the region. The methodology adopted was essentially a survey involving the use of questionnaire. A total of 488 Estate Surveyors and Valuers comprising of 304 in Rivers State, 118 in Delta State and 66 in Bayelsa State. Data collected were analyzed using tables and mean ranking. The study revealed that the variables to consider when valuing contaminated agricultural lands include the extent and type of contamination, comparable sales, market perception and stigma among others. It was recommended that market perceptions and stigma associated with contaminated lands be addressed through public enlightenment, outreach, and education. Comparable sales data should be used to benchmark property values. Collaboration among stakeholders, including property owners, investors, regulators, and environmental professionals, is essential to facilitate transparent decision-making and due diligence in dealing with contaminated land transactions.

Keywords: Agricultural Lands, Contamination, Real Estate, Valuation, Variables

Introduction

The valuation of property holds significant importance across global real estate markets and stands as a cornerstone in determining their worth and facilitating transactions. They are influenced by a range of factors, and identifying these factors constitutes a crucial component of property valuation. Appraisal of real estate depends heavily on information, and while information is not so easy to come by in real estate, it has not been totally unavailable either. Since real estate appraisal often encounter sparse information, real estate appraisal's education and experience

are essential to use this limited information to generate credible estimates.

A multitude of variables are meticulously considered in this process, each playing a vital role in shaping the final valuation. These variables encompass a diverse array of factors ranging from location and market trends to physical attributes and economic indicators. Understanding and analyzing these variables are essential not only for property appraisers and real estate professionals but also for investors, buyers, and sellers seeking to make informed decisions in the property market. This

introduction sets the stage for a comprehensive exploration into the intricacies of the variables utilized in the valuation of properties, shedding light on their significance and interplay in determining the value of real estate assets.

Historically, since the valuation process has always been dependent on such factors as demand and supply, coupled with the fact that value of any given property is not arrived at in isolation, it should be, if only logically, that those factors and variables that help appraisers determine the value of a given property can also affect or even go on to determine the value estimate of a contaminated agricultural lands. This works in such a way that appraisers analyze trends in these forces while trying to determine the speed, direction, strengths, and limits of these trends. Some of these variables that have been known to affect the value of a contaminated agricultural lands is discussed under the literature review.

Literature Review

The valuation of contaminated agricultural lands presents unique challenges due to the complex interactions between environmental factors, land use regulations, and market dynamics. This literature review aims to provide insights into the variables utilized in the valuation of contaminated agricultural lands, focusing on the key determinants and methodologies employed in this specialized field.

One of the primary variables considered in the valuation of contaminated agricultural lands is the extent and type of contamination. Studies have shown that the presence of contaminants such as heavy metals, pesticides, and petroleum hydrocarbons can significantly impact soil fertility, crop productivity, and human health risks (Olsen, Cole, Watanabe and Dean, 2019; Brevik, Sauer and Hartemink, 2020). The concentration levels, distribution patterns,

and mobility of contaminants within the soil profile are critical factors that influence the severity of land degradation and remediation costs (Kabata-Pendias and Mukherjee, 2007; Smith, Obeid and Jensen, 2009).

The regulatory environment represents another essential variable in the valuation of contaminated agricultural lands. Government regulations and policies governing soil quality standards, land use restrictions, and liability regimes play a crucial role in determining the legal and financial implications of contamination (Tietenberg and Lewis, 2014; Boyd and Banzhaf, 2007). Compliance with environmental regulations, potential liabilities for remediation, and future land use restrictions are important considerations that affect the perceived value of contaminated agricultural properties (Greene, Hensher and Rose, 2012; Boyd and MacDonald, 2000).

Furthermore, market conditions and demand dynamics influence the valuation of contaminated agricultural lands. Studies have explored how market perceptions, risk perceptions, and information asymmetry impact property values in contaminated land markets (Jenkins, Martens and Saari, 2016; Johnston and Rosenberger, 2010). Factors such as proximity to urban centers, accessibility to infrastructure, and alternative land uses also play a role in determining the market value of contaminated agricultural properties (Mallach, 2003; Logan and Zhou, 2012).

Methodological approaches for valuing contaminated agricultural lands vary depending on the specific context and objectives of the valuation. Traditional appraisal methods, such as sales comparison, income capitalization, and cost approach, are commonly used but may require adjustments to account for contamination-related risks and liabilities (Bicknell and McCreanor, 2001; Alberini, Longo and Tonin, 2006). Contingent valuation, hedonic pricing, and

choice modeling techniques have also been employed to assess stakeholders' preferences and willingness to pay for remediation and land restoration efforts (Krupnick, Alberini, Cropper and Simon, 2002; Bateman, Carson, Day, Hanemann, Hanley and Sugden, 2002).

In the past, the valuation process has consistently relied on factors like demand and supply. Additionally, it is important to note that the value of a property is not determined in isolation but influenced by various elements. It follows, therefore, that the factors used by appraisers to assess a property's value can similarly impact or even establish the estimated value of that property. According to Antai (2003), some of the factors that have been known to affect the value of a property with respect to either the supply of or the demand for property namely social forces, economic forces, governmental forces and environmental forces. According to Ogunba (2013), Contamination may affect property value in two ways:

First, there could be loss of value at and around toxic, chemical and solid waste landfills due to various costs of remediation or containment. There may be considerable costs associated to such remediation. The severity of contamination affects the value in terms of cost to cure, time to cure, and loss of income during cure. The more severe the problem, the greater the cost of clean-up, containment, and possible future monitoring.

Extent and Nature of Contamination: The property owner must provide clear documentation of the nature and extent of environmental contamination. Accurate and detailed maps must be included as part of this documentation. Without information, property must be valued as if uncontaminated. Some contamination, such as air pollution, may be universal throughout a jurisdiction. In all other cases, contamination should be viewed as a special circumstance, particular to a property. To be granted special consideration affecting value,

the owner must substantiate the contamination through an independent party (typically, an engineering firm testing for contaminants or a regulatory agency). Other variables as it affects valuation of contaminated agricultural lands are as follows:

Comparable sales

Comparable sales refer to the prices at which similar contaminated agricultural lands have been sold in the real estate market. This variable provides valuable benchmarks for assessing the market value of a subject property based on its similarities with recently sold properties. By comparing key characteristics such as size, location, contamination levels, and remediation status, comparable sales help appraisers and investors estimate the fair market value of contaminated agricultural lands. Comparable sales data serve as a vital tool in the valuation of contaminated agricultural lands, allowing stakeholders to gauge market trends, pricing dynamics, and investor sentiment" (Jones, 2018). Through the analysis of comparable sales, stakeholders can identify patterns and trends in contaminated land markets, assess the impact of contamination on property values, and make informed decisions regarding investment, acquisition, or divestiture of contaminated properties. Understanding the sales prices of similar contaminated agricultural lands provides valuable insights into market demand, buyer preferences, and pricing strategies, enabling stakeholders to negotiate transactions effectively and maximize returns on investment (Smith, 2019).

Market perception and stigma

Market perception and stigma refer to the collective beliefs, attitudes, and sentiments of market participants toward contaminated agricultural lands. This variable captures the perceived risks, uncertainties, and reputational concerns associated with

contamination, which can influence buyer behavior, market dynamics, and property values. Stigmatized properties may face challenges in attracting buyers, securing financing, and realizing their full market potential. Understanding market perception and stigma is essential for accurately assessing the market value of contaminated agricultural lands and devising effective marketing and risk management strategies (Smith, 2019). Market perception and stigma represent critical variables in the valuation of contaminated agricultural lands, influencing market demand, pricing dynamics, and investor behavior (Brown, 2020).

Remediation costs

Remediation costs refer to the expenses incurred in restoring contaminated agricultural lands to an acceptable level of environmental quality, thereby mitigating risks to human health and the environment. These costs encompass a range of activities, including soil and water remediation, containment, monitoring, and site restoration efforts. The determination of remediation costs is influenced by various factors, such as the extent and type of contamination, site-specific conditions, regulatory requirements, and remediation technologies employed.

In the valuation of contaminated agricultural lands, remediation costs play a significant role as they directly impact the overall investment required to rehabilitate the land for productive use. Higher remediation costs may result in reduced property values, as potential buyers or investors factor in the financial burden of cleanup efforts when assessing the feasibility and profitability of acquiring contaminated properties. Conversely, properties with lower anticipated remediation costs may command higher market values, reflecting lower perceived risks and investment requirements.

Risk assessment

Risk assessment involves evaluating the potential risks and uncertainties associated with contamination on agricultural lands, encompassing factors such as environmental hazards, health risks, regulatory compliance, and financial liabilities. This variable plays a crucial role in the valuation process by informing stakeholders about the level of risk exposure and the likelihood of adverse events affecting the property's value. By conducting a comprehensive risk assessment, stakeholders can identify and quantify the various risks posed by contamination, including soil and water pollution, health hazards, legal liabilities, and remediation costs. This information helps investors, property owners, and regulators assess the financial implications and risk-adjusted returns associated with contaminated land investments. Moreover, risk assessment enhances transparency and due diligence in contaminated land transactions by highlighting potential areas of concern and guiding risk mitigation efforts.

Market demand

Market demand refers to the level of interest and desire among potential buyers or users for contaminated agricultural lands in the real estate market. It reflects the perceived value, attractiveness, and utility of these lands relative to alternative investment opportunities or land uses. The assessment of market demand involves analyzing factors such as demographic trends, economic conditions, regulatory dynamics, and environmental considerations that influence buyer preferences and purchasing decisions. In the valuation of contaminated agricultural lands, market demand plays a pivotal role as it directly influences property prices and market activity. High market demand for contaminated lands may drive up property values, indicating strong investor confidence and perceived opportunities for profitable land use or redevelopment. Conversely, low market demand may result in depressed property values, reflecting perceived risks,

uncertainties, or limited potential for profitable utilization of contaminated lands.

Adjacent land use

Adjacent land use involves the types of activities or developments occurring in the vicinity of contaminated agricultural land. This variable considers the influence of neighboring land uses on property values, market dynamics, and contamination risks, as well as the compatibility of adjacent land uses with potential redevelopment or remediation efforts. According to Jones (2017), assessing adjacent land use is essential in the valuation of contaminated agricultural land, as it provides insights into the surrounding environment, land use patterns, and potential sources of contamination. Stakeholders can assess the potential impacts of adjacent activities on contamination risks, property values, and redevelopment opportunities by analyzing land use patterns, zoning regulations, and environmental conditions in the vicinity.

Highest and best use

Highest and best use refers to the most financially advantageous and legally permissible use of contaminated agricultural land that is physically possible, financially feasible, and maximally productive. Assessing the highest and best use of contaminated agricultural land is essential for determining its optimal value and guiding land use planning and redevelopment decisions (Smith, 2018). Highest and best use scenarios help stakeholders to evaluate the economic viability, investment potential, and risk-adjusted returns associated with different land uses, including agricultural, residential, commercial, or industrial developments. This analysis helps optimize land utilization, maximize property values, and promote sustainable development practices.

The location and type of property

This may influence the degree of loss of value or utility due to contamination. For example, the value of a manufacturing facility in a heavily populated area would probably experience greater value impact due to public sensitivity to reports of nearby contamination, (i.e., stigma) than a plant located among other industrial plants in a sparsely populated location. A plant located in a highly populated area could be perceived as less valuable because its location puts the owner/user a higher risk for legal action based on health claims and/or migrating contaminations. In certain instances, government regulations may mandate an entire industry to install equipment to address environmental hazards.

Research Methodology

The study employed the survey research approach, which involved collecting data from the sampled population of the study. The population for the study is primarily the Estate Surveyors and Valuers in Bayelsa, Delta and Rivers States, Nigeria. The Estate Surveyors and Valuers as mentioned are the real property consultants professionally recognized in Nigeria to value land and landed properties. The directory of the Nigerian Institution of Estate Surveyors and Valuers indicated that 304 Estate Surveyors and Valuers are in Rivers State, 118 in Delta State and 66 in Bayelsa State. A total of 488 Estate Surveyors and Valuers made up the population of the study.

Total population sampling was used as the sampling technique. Here, the population of the study serves as the sample size for the study. In this study, an ordinal measurement scale of 1 to 5 was used to determine the effect level of each variable. Respondents were asked to score their responses according to the degree of importance: where 1 = strongly agree; 2 = agree; 3 = undecided; 4 = disagree; 5 = strongly disagree. The sources of data included Primary and Secondary Sources of data. Primary sources of data were

used as a means to collect first-hand information of the variables for valuing contaminated agricultural lands in the study area through administration of questionnaires. Secondary sources of data used in this research were taken from various journals, seminar papers, textbooks, past projects and some other documented materials, some of which may be published or unpublished. In the presentation, analysis and interpretation of data, tabular, statistical and textual modes of data presentation were used. The responses for each relevant question in the questionnaire were represented in tables and the statistical results used to compare the relative importance of various answers. For the variables to be rated against a scale to assist in assessing the significance of each variable.

Result

Table 2: Ranking of the variables considered in valuation of contaminated agricultural lands.

S/N	Variables	Strongly Agreed (5)	Agreed (4)	Neutral (3)	Disagreed (2)	Strongly Disagreed (1)	Mean	Ranking
1	Extent and Type of Contamination	153	101	50	36	44	3.74	1 st
2	Remediation Costs	140	90	52	51	51	3.57	4 th
3	Location	38	42	60	120	124	2.35	12 th
4	Market Demand	40	44	80	120	100	2.49	8 th
5	Environmental Impact Assessment (EIA)	130	100	50	52	52	3.53	5 th
6	Comparable Sales	140	100	62	46	36	3.68	2 nd
7	Risk Assessment	120	90	48	62	64	3.36	7 th
8	Market Perception and Stigma	140	110	42	45	47	3.65	3 rd
9	Easements and Access	44	48	75	100	117	2.48	9 th
10	Highest and Best Use	38	38	70	120	118	2.37	11 th
11	Adjacent Land Use	38	46	60	120	120	2.38	10 th
12	Regulatory Compliance	120	100	48	68	48	3.46	6 th

Table 2 displays the opinions of the respondents (Estate Surveyors and Valuers) on the variables they considered when valuing contaminated agricultural lands in South-South Geopolitical Zone of Nigeria. From Table 2 the most considered of the variables is “extent and type of contamination” with a mean score of 3.74 and ranked the first. The second “comparable

Table 1: Analysis of distributed questionnaire and retrieval

S/ N	State	Questionnaire distributed	Questionnaire retrieved
1	Bayelsa	66	54 (81.8%)
2	Delta	118	95 (80.5%)
3	Rivers	304	235 (77.3%)
	Total	488	384 (78.7%)

Table 1 shows the distribution and retrieval of completed questionnaire from the respondents in the study states. A total number of 488 copies of the questionnaires were distributed across the 3(three) study states in South-South Geopolitical Zone of Nigeria; and a total of 384 completed were retrieved representing 78.7%. The breakdown of the distribution and retrieval according to the states are presented in Table 1.

sales” while “market perception and stigma” came third in relative importance in the view of the respondents. The least considered variable in the opinion of the Estate Surveyors and Valuers is Location which has a mean score of 2.35 and ranked 12th. Highest and best use of the land came second from the bottom in the ranking of the variables. By this ranking it is a common believe among the

majority of the Estate Surveyors and Valuers practicing in the South-South Geopolitical Zone of Nigeria that location and what constitutes the highest and best use of the land do not matter in the valuation of contaminated agricultural lands in the Zone. The most critical variables to consider in the valuation are type and extent of contamination of comparable agricultural lands and the market perception and stigma associated with such contamination among others.

Discussion

From the analysis, it was revealed that the variables identified by the study to consider when valuing contaminated agricultural lands were strongly agreed to. The most considered of the variables is the extent and type of contamination followed by comparable sales and market perception and stigma.

Firstly, the analysis highlighted that the extent and type of contamination are paramount variables to consider. This implies that the severity and nature of the contamination significantly impact on the valuation process. Factors such as the concentration levels of contaminants, the types of pollutants present (e.g., heavy metals, pesticides), and the potential risks posed to soil fertility, crop productivity, and human health are critical considerations. The severity of contamination can directly affect the remediation costs and the viability of agricultural activities on the land, thus influencing its market value.

Similarly, comparable sales emerged as another important variable. Comparable sales refer to the prices at which similar contaminated agricultural lands have been sold in the market. This variable provides valuable insights into the market value of the subject property by comparing it with similar properties in terms of size, location, contamination levels, and other relevant

factors. Comparable sales data help appraisers and investors gauge the market demand and pricing trends for contaminated agricultural lands, enabling more informed valuation decisions.

Furthermore, the analysis indicated that market perception and stigma are significant variables in the valuation process. Market perception refers to the collective beliefs, attitudes, and sentiments of market participants toward contaminated agricultural lands. If a property is perceived negatively due to its contamination status, it may suffer from stigma, resulting in decreased demand and lower property values.

Conclusion

The study discussed the various variables considered in valuing contaminated agricultural lands in South-South Geopolitical Zone of Nigeria. The valuation of contaminated agricultural lands involves a multifaceted consideration of various key variables. The study revealed that careful consideration of the extent and type of contamination, comparable sales and market perception and stigma and numerous variables highlighted in the research will help to determine accurate land values for contaminated agricultural lands in the study area. Other variables, including remediation cost, location, market demand, environmental impact assessment, risk assessment, highest and best use, adjacent land use and regulatory compliance can collectively influence the perceived value and marketability of contaminated lands.

Therefore, by comprehensively analyzing these variables and their interrelationships, one can make informed decisions regarding land acquisition, valuation, remediation strategies, and investment opportunities.

Recommendation

The study resulted in the following recommendations:

1. Address market perceptions and stigma associated with contaminated lands through effective communication, outreach, and education efforts. Highlight remediation efforts, risk mitigation measures, and future redevelopment plans to improve market acceptance and property values.
2. Utilize comparable sales data to benchmark property values and assess market trends in contaminated land markets. Analyze recent sales transactions of similar properties to inform pricing decisions and negotiate fair market values.
3. Foster collaboration among stakeholders, including property owners, investors, regulators, and environmental professionals, to facilitate transparent decision-making and due diligence in contaminated land transactions. Seek expert guidance and engage in thorough due diligence processes to mitigate risks and maximize the value of contaminated agricultural lands.

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