ECONOMIC VALUE DETERMINATION AS A STRATEGY FOR BUILDING RESILIENT COMMUNITIES IN THE NIGER DELTA REGION OF NIGERIA

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Abstract:

In a novel approach to disaster resilience that embodies a multidisciplinary problem-solving process in determining the value of damaged property, a framework has been developed for determining the economic value of damages to property due to contamination, from human-caused oil spill disaster in the Niger Delta.

The framework will result in a reduction of the recovery process of affected communities following an oil spill as they know in advance what will be done and result in standardisation of the valuation process, enable the polluter to know the cost of their malfeasance and provide the property owners with the economic value of their polluted property to enable them continue their livelihood.

Professional valuers and property owners are very dissatisfied with the current practice without a standard framework and oil company operators hardly realise the economic cost of disasters imposed on the communities. Reviewing the theory and practice of economic value and ecosystem valuation, a mixed-methodology was employed using questionnaires and expert interviews to ascertain how contaminated wetland property is valued, the professionals involved and their respective roles. The proposed framework will provide a systematic process leading to the determination of economic value of damages due to contamination of wetlands property.

Keywords: Disaster resilience, Vulnerability, Economic value, Property damage, Niger Delta.

1.0 Introduction:

The Niger Delta region of Nigeria has been experiencing a high risk from human-made and natural hazards and disasters in recent times. The losses due to disasters have been increasing with grave consequences for the survival, dignity, and livelihood of individuals (ISDR, 2005). Disasters occur when hazards interact with physical, social, economic, and environmental vulnerabilities. These vulnerabilities are related to changing demographic, technological and socio-economic conditions, unplanned urbanization, development within high-risk zones under-development, environmental degradation, climate variability, climate change, geological hazards, competition for scarce resources, the impact of social restiveness and epidemics such as HIV/AIDS (ISDR, 2005). Within the Niger Delta region the primary source of hazard has been traced to environmental degradation caused by oil spills resulting from the development of oil/gas projects which sustains the Nigerian nation's economy. The direct impacts of oil spills and other environmental shocks can be devastating on households and their livelihoods. In some cases, the long-term effects of such shocks, leads forward-looking households to adopt asset protection strategies which may come at a very high cost of immediately reduced consumption. While some households may be resilient to environmental hazards and disasters, others are unable to cope effectively and sometimes lose their livelihoods completely. An oil spill environmental disaster impacts the economy in three phases: the period of occurrence; the coping period when the land is decontaminated and households deal with the immediate losses created by the disaster; and the recovery period after decontamination and households try to rebuild the assets lost to the disaster. Disaster impact may include asset destruction, where planted farmland is completely destroyed; reduction in the disposable income of households as a result of crop failure or increase in medical expenses or costs of improving the usability of contaminated properties. Adopting the UN/ISDR (2004)'s definition, this paper refers to a hazard, as "a potentially damaging physical event, phenomenon, or human activity that may cause the loss of life or injury, property change, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins like natural (geological, hydro meteorological and biological), or induced by human processes (environmental degradation and technological hazards). Similarly, vulnerability

refers to “the conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards” (UN/ISDR, 2004), and resilience is “the ability of a system, community, or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions” (UN/ISDR, 2009). The occurrence of human-caused disaster requires the management of the contaminated environment if the inhabitants are to be resilient to such experiences. Efforts to respond to the occurrence of such disasters have been to provide palliative measures to the affected landowners and pay compensation for any damages suffered, with the process been seen as consisting of only the determination of the compensation payable by professional valuers, without consulting other professionals whose inputs are required to analyse the impact of the spill on the environment. This paper aims to illustrate a multidisciplinary approach to solving the problem of determining the value of properties damaged by human-caused oil spill disasters in the Niger Delta, by proposing a framework that can be adopted.

Contaminated Land Valuation Internationally

The practice of valuing contaminated land is not unique to the Niger Delta. While most countries with well-developed valuation practice appear to have perfected their methods, the Niger Delta practice appears to be less developed. The United Kingdom (UK), Australia and New Zealand, and United States of America (USA) all appear to have perfected the use of conventional valuation approaches to value contaminated land. These countries mostly use the direct comparison (Patchin, 1994), capitalisation method (Patchin, 1988; Mundy, 1992; Dixon, 1996), cost approach (Wilson, 1994), hypothetical development method/residual method (Liang, 1992, cited in Syms, 1997), and discounted cash flow method (Gronow, 1999). The difficulty of applying these conventional methods was highlighted in the works of Kinnard (1992) and Syms (1997) when they observed that in view of the dependence on market evidence of the conventional methods and the lack of transaction data on contaminated properties, it is difficult to rely on market evidence to estimate prices, rents and yields of contaminated properties. Also, Wilson (1992) cautioned that “each environmental problem is as unique as a fingerprint” and Chan (2000) confirmed that it is difficult to get true comparables to apply the direct comparison

method. These difficulties have led to the search for more advanced alternative methods like Syms (1997) risk assessment model in the UK, and other methods in USA like Multiple regression analysis, Survey Methods, Environmental Case studies, etc.

All these methods rely on the availability of an active property market and data from previous market transactions, to be able to assess the impact of contamination on property value, as noted by Bartke (2012), these methods are helpful for providing background to understanding the possible impacts of contamination, but typically they are not seen as methods to determining actual market behaviour and market values which should be based on actual market transactions. The available literature has focused on how existing appraisal methods were adapted to estimate the impact of contamination on value of residential and industrial properties Also, none of the stated methods had been applied to wetlands by valuers, yet there is a preponderance of wetlands that are constantly being contaminated by pollution due to oil spillage in the Niger Delta. Since a wetland by its nature is a composite of both the upland where residential or industrial properties can be developed, and the wetland serves both recreational and other economic uses, it behoves valuers to adopt a method of valuation that can appropriately assess the value of each component of the wetland economically.

While Valuers have developed competences in valuing contaminated lands internationally, they appear to have left the valuation of wetlands per se, to ecologists and environmental economists who have used economic valuation methods like imputed preference, revealed preference, or stated preference methods (Defrancesco *et al*, 2012). Some authors like Zafonte and Hampton, 2007; and Matin-Ortega *et al.*, 2011, advocated the preference of damage assessment methods based on bio-physical indicators and on Habitat or Resource Equivalency where compensation is based on remediation, while others have advocated the addition of monetary valuation to habitat and resource equivalency, arguing that this is the only way to reflect individual utility functions in damage assessment since the impact of any contamination, falls on individual claimants (Flores and Thatcher, 2002; Dunford *et al*, 2004; Martin-Ortega *et al*, 2011). Defrancesco *et al* (2012) posits that monetary evaluation of environmental damage is not only technical but allows the inclusion of efficiency and equity concerns in the determination of the attendant compensation, but stresses that the experiences with such assessments are scarce in Europe, though widespread in the United States of America. Even in America where such assessments

are common, published literature only indicates various approaches that may be used in valuing contaminated real estate or wetlands per se, but no framework has been proposed to incorporate all the necessary stages that lead to the determination of environmental damages (see Patchin, 1988; Mundy, 1990; Kinnard, 1991; and Wilson, 1991). The only framework for evaluating environmental damages centred on economic concepts reflecting individuals' utility preferences and Total Economic Value of impacted resources and also integrating bio-physical damage assessment was suggested by Defrancesco *et al* (2012). These authors put forward a matrix-based framework for environmental damage valuation which focused on non-market value elements of an environment when determining the total economic value including non-use or passive values with reference to Italian laws. While the framework provides an approach to valuing damaged ecosystems, it does not cover the incorporation of land and buildings which may form part of the ecosystem. As stated above, a wetland usually consists of both the upland and the wetland which Defrancesco *et al*.'s framework does not accommodate. While their framework is useful, it is limited in application as it concentrates on welfare losses suffered by individuals becuase of environmental damage. It does not incorporate the diminution of real estate values arising from environmental contamination and thus confines its application to the wetland portion of a typical wetland, neglecting the upland portion. But as stated by Defrancesco *et al* (2012), an environment can be analysed from different complimentary viewpoints which include i) the scientific view which identifies the role of physical and biological systems; ii) the antropocentric-economic viewpoint which defines the value of ecosystems and assesses the changes in society's welfare; and iii) the socio-political view which deals with the ranking of values. It is necessary to reflect all these in valuing wetlands. It is in bid to feel this vacuum that a composite framework that incorporates the valuation of both the upland and the wetland ecosystem is being proposed.

2.0 Background Information on Nigeria

Nigeria has a population of about 173.615 million people as at 2014 (World Bank, 2013). It is the most populous nation south of the Sahara with an area of 923,768 square kilometres, with annual growth rate range of between 2.8 and 3.2 percent between states. The Country lies between Longitude 3^0East and 15^0East and Latitude 4^0North and 140^0 North. It is bordered in the north by the Republics of Niger and Tchad; in the West with the Republic of Benin, in the south-

east by the Republic of Cameroun and in the south by the Atlantic Ocean which forms a coastline of about 800km. It measures about 1200km from east to west at its widest point and about 1050km from north to south. Its topography ranges from the Niger Valley lowlands along the coast, to high plateaus in the north and mountains along the eastern border.

3.0 Geographic Location of the Niger Delta:

The Niger Delta with an estimated area of about 70,000 km^2 is one of the world's largest deltas. It is located in the central part of Southern Nigeria between above latitude 5°33′49″N and 6°31′38″E in the north. Its western boundary is given as Benin 5°44′11″N and 5°03′49″E and its eastern boundary is Imo River 4°27′16″N and 7°35′27″E. It contains the world's third largest mangrove forest, the most extensive freshwater swamp forest in West and Central Africa and most of Nigeria's primary forests. The region, situated in the southern part of Nigeria, is bordered in the east by the Republic of Cameroun and, in the south, by the Atlantic Ocean. Within Nigeria, the region is defined both geographically and politically, the latter description being for revenue sharing purposes. The geographic Niger Delta includes the littoral States of Rivers, Bayelsa, Delta Cross River and Akwa Ibom and has an area of about 67,284 square kilometres with a combined population of 16,331,000 persons. The political Niger Delta includes these and, in addition, Abia, Edo, Imo, and Ondo states, with a total area of 112,110 square kilometres of land in 2006, and represents about 12% of Nigeria's total surface area (NDDC, 2006). Figure 1, shows the States now known as the political Niger Delta States by the National Space Research and Development Agency of Nigeria (NASRDA, 2008).

The area consists of a vast coastal plain spanning approximately 853 km facing the Atlantic Ocean endowed with immense natural resources especially hydrocarbon deposits. It is estimated to have about 37.2 billion barrels of proven oil and 5.153 trillion cubic feet of gas reserves in 2012. There are about 606 oil fields in the Niger Delta, of which 360 are on-shore and 246 are offshore (Nwilo and Badejo, 2007). Most of the new oil fields are deep water fields developed and being developed offshore. Within the Niger Delta area, there are over 21,000 kilometres of moderate-to-large (152 mm–1219 mm diameters) oil pipelines; about 5284 oil wells drilled and 527 flow stations for crude oil processing, with more than 7000 km of oil and gas pipelines traversing the entire area, and seven export terminals (DPR, 2010). The region houses key

industries with three refineries, two petrochemical plants, one liquefied natural gas, a major steel plant and three gas-fired electric power generating stations.

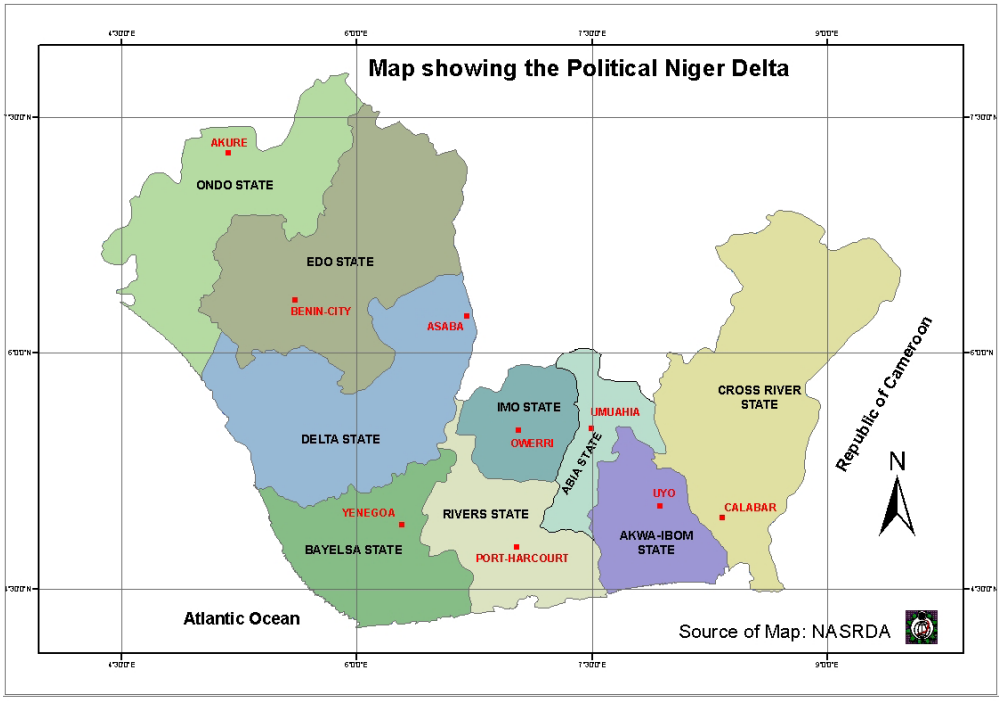

Figure 1: Map of the political Niger Delta
Source: Adapted from NASRDA (2008)

Official statistics indicate that, between 1976 and 1996 a total of 4647 incidents resulted in the spill of approximately 2,369,470 barrels of oil into the environment. Table 1 shows some oil spill incidents.

Table 1: Some Reported Oil Spills

S/No.	Year	Location	Operator	Quantity Spilled (Barells)
1.	1978	Escravos, Delta State	GOCON	300000.
2.	1978	Forcados Terminal, Delta State	Shell Petroleum Development Company	580000
3.	1980	Funiwa-5, Bayelsa State	Texaco Oil Company	400000
4.	1982	Abudu Pipeline	Shell Petroleum Development Company	18 818
5.	1998	Idoho Oil Well	Mobil Producing Unlimited	40000

Source: Babawale (2013)

The region is endowed with both renewable and non-renewable natural resources. The major non-renewable resources include fossil fuels, crude oil and natural gas and construction materials such as gravel, sand, clay and earth. Sand is obtained from both land and river beds. Like other wetlands, the Niger Delta is subject to intense and growing pressures for development of residential, commercial and industrial development of oil and gas. Wetland species are harvested at very high rates and the scourge of pollution has pervaded the region and given it an identity. Land use decisions have been based on a development imperative that favours constant modification of the wetland for economic advancement of the nation. The attendant pollution that follows the production and evacuation of oil and gas has been allowed to continue without the economic value of the goods and services being considered, and not being factored into the development decisions. The region's biodiversity and natural ecosystems continue to be reclaimed, degraded and lost because they are seen as being "value-less" especially when compared to the gains from oil and gas production, whose revenue sustains the national economy.

4.0 Definition of Wetlands:

A wetland is an area of land that is wet for all or part of the year like swamps and marshes and it is usually fed by creeks, streams, or even underground springs. It is a natural and important habitat for frogs, birds, turtles, molluscs, periwinkles, oysters and serves as a fish nursery. The Ramsar Convention (2005) defines it as "……areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt including areas of marine water, the depth of which at low tide does not exceed six metres. " They are generally lands where saturation with water is the dominant feature determining the nature of soil development and the type of plant and animal communities living in the soil and on its surface and generally occupy about 6% of the world's land surface. Wetlands are generally divided into three categories namely marine/coastal type; inland type; and human-made types. In the Niger Delta, the different types of wetlands consists of both the upland and the wetland as opined by Keating (2002), that two property types are often involved in any wetland. The oil infrastructures within the Niger Delta render the region liable to incessant contamination by oil spill disasters which cause hardship to the inhabitants, and require response skills that will ameliorate such disasters.

5.0 Rationale for Valuation of Wetland Ecosystem Goods and Services:

The management and use of a contaminated wetland poses serious challenges to the stakeholders of such wetland. The polluters require deciding what measures to implement to ameliorate the adverse effects of the contamination on the impacted communities, with such measures ranging from the provision of temporary relief to the payment of compensation for damages suffered, as determined by a professional valuation of such damages. A comprehensive response will require the consideration of the duration of impact of the contamination on the affected wetland. Management decisions involving the payment of compensation will require the valuation of the damaged properties, and as Heal (2000) cited in Berkes and Folke (1998), stated valuation is a way of organizing information to help guide decisions but is not a solution or end in itself. It is one tool in the much larger politics of decision making and wielded together with financial instruments and institutional arrangements, allow individuals to capture the value of ecosystem assets. The Millennium Ecosystem Assessment (2005), defines "Valuation" as the process of expressing a value for a particular good or service in terms of something that can be counted, often money, but also through methods and measures from other disciplines (sociology, ecology and so on)

Economic valuation is often undertaken to influence a decision. It is important to consider carefully, the decision the valuation advocacy intends to influence. Being based on the view of the ecosystem as a source of goods and services for consumption and other inputs for production, economic valuation is influenced by human use or enjoyment of the environment. While the UNEP/Convention on Biological Diversity (1996) asserted that the failure to properly value natural resources generates misleading information about their abundance, Mooney *et al.* (2005) stated that the logic behind ecosystem valuation is to unravel the complexities of socio-ecological relationships, make explicit how human decisions would affect ecosystem service values, and to express these value changes in units like money that allow for their incorporation in public decision-making processes. Brander *et al*. (2010) summarized the six reasons for conducting valuation studies as missing markets; imperfect markets and market failures; to understand and appreciate the alternatives and alternative uses of some biodiversity goods and services; to appreciate the uncertainty involving future supply and demand of natural resources; for use in designing biodiversity/ecosystem conservation programmes; and for use in natural resource accounting. Otegbulu *et al* (2013) opined that ascertaining and assigning the full value

of natural resources is crucial to protecting such resources. This full value can only be determined through an economic valuation and as Kopp and Smith (1993) stated, damage assessment is undertaken to estimate how the value of one or more natural assets injured by hazardous waste or oil has changed due to those injuries. Though it has been argued that it is either impossible or un-necessary to value ecosystems as we cannot place value on such 'intangibles' as human life, environmental quality or long-term ecological benefits, valuation is done unintentionally every day. When construction standards are set for highways, bridges and the like, we are in fact valuing human life as spending money on construction would save lives. Since ecosystem goods and services provide outputs and outcomes that directly and indirectly affect human wellbeing, valuation is necessary as it will contribute to better decision making by ensuring that policy appraisals take into account, the costs and benefits to the natural environment and the implications of new developments on human wellbeing. Otegbulu *et al* (2013) opined that natural resources are managed sustainably as to place proper values on such resources. A proper value is practically an economic value that reflect the use and potentials of such resources. To them, this is necessitated by the fact that natural ecosystems serve economic values and environmental functions that have positive economic values and that where natural resources are assigned zero values, an over-exploitation of such resources very often results. It is the need to capture the total economic value of degraded environments that De Groot, Wisdom *et al* (2002) suggested the framework for valuing the total economic value of ecosystems illustrated in figure 2 below:

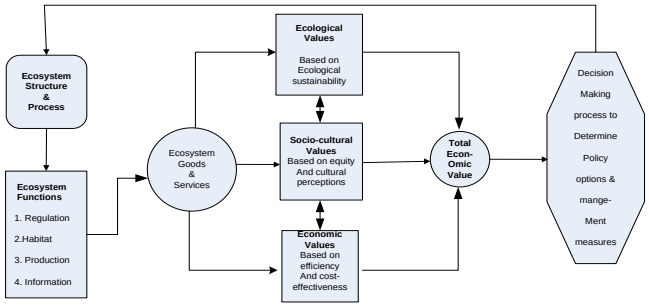

Figure 2: Framework for Ecosystem Total Economic Value Valuation
Source: De Groot, Wisdom et al (2002)

6.0 The Bodo Oil Spill Case:

Sometimes in December 2008, an oil spill occurred within the wetlands owned and used by members of Bodo Community in the Gokana Local Government area of Rivers State in the Niger Delta region. The spilled oil was not cleaned but left to contaminate the soil and neighbouring land surrounding the coastline. In the bid to manage the conflict attending the spill, different professionals were engaged independent of one another to study and advice on the impact of the attendant contamination on the community land and properties. The results of these studies were used by lawyers representing the affected community, to litigate for compensation for the community. The absence of any co-ordination between the various professionals resulted in the production of disjointed reports which proved almost impossible to enforce and the clamour for an alternative means of dispute resolution that did not require the reports and posed difficulties for the stakeholders. Attempts to determine the values of the damages suffered only resulted in the determination of a cross-sectional value without any regard to the duration of the impact of the contamination on the environment but as Defrancesco *et al* (2012) opined, environmental damage valuation focuses on relationships, over time and space, between damaged resources and the behaviour and utility levels of the affected individuals. The valuers' input to the decision making process was made by adopting property valuation methods that failed to account for the wetland portion of the contaminated land due to the fact that professional valuers are only trained in the methods of property valuations that do not incorporate wetland valuation techniques. To be able to propose a robust framework that could be used for such analysis, a case study approach was adopted since the methodology admits multiple sources of data collection.

7.0 Materials and Methodology:

This paper presents the results of a survey that was administered between December 2012 and January 2013 to professional valuers in the Niger Delta of Nigeria. The Niger Delta was chosen since the region hosts the oil industry in Nigeria and experiences incessant oil spills that have resulted in several cases of environmental contamination. The professional valuers were selected from the directory of The Nigerian Institution of Estate Surveyors and Valuers, Rivers State Branch (2011), a professional body that registers professional valuers/firms engaged in valuation practices in Nigeria. To validate the results from the returned questionnaire, academics who train prospective valuers and have been engaged in Valuation Consultances, were sent validation questionnaire by mail and their responses reflected in the final framework developed.

A total of 120 questionnaires which contained 23 questions that took approximately 20 minutes to complete, were sent out to the firms, ministries and academics. 65 questionnaires were returned out of which 62 completed questionnaires, representing a response rate of approximately 52% were useable. The other 3 were discarded due to incompletenes. The firms were Estate Surveying and Valuation firms, the ministies were those that employed profesional valuers, while the academics were prfessional valuers teaching Valuation courses and are engaged in Valuation consultancies. Table 1 shows that consultant Estate Surveyors and Valuers constituted the bulk of the respondents.

Table 2: Classification of Respondent Firms

Specialisation	Frequency	Percentage
Estate Surveyor and Valuer	1	1.6
Property/Facility Manager	17	27.9
Consultant Estate Surveyor and Valuer	43	70.5
Feasibility Study Experts	0	0
Estate Surveyor and Valuer	0	0

Source: Field Data (2013)

The survey questions covered general questions about the specialization of the firm, wetland valuation methods, the competency of the valuers and the need for a composite method of valuation incorporating both market value and non-market values. After the initial delivery of the survey instrument, phone-calls were made to remind respondents and a follow up visitation made to retrieve the questionnaire. All responses were anonymous. Analysis was by means of frequency distribution, using the SPSS as the analytical engine for output. After the analysis of the survey, the developed framework was mailed to 10 academics and experienced valuers to confirm its usefulness and their responses and comments were used to modify and produce the final framework shown here. The academics were purposively selected and was informed by the need to balance theory with the practical input of the practicing valuers.

8.0 Results:

The study revealed that the applicable Valuation methods are the Comparable Sale Method (ComSalcont); Depreciated Replacement Cost Method (DepRepcont); Use of Pre-determined Compensation Rates (PreRatecont); Income Capitalisation Method (Incmetcont); Subdivision Development Valuation Method (SDmetcont); Land Value Extraction Method (LVExtcont);

Discounted Cash Flow Technique (DCFcont); Contingent Valuation Method (Convalcont); and Hedonic Pricing Model (HPMcont). Table 3 indicates the various responses.

Table 3: Frequently Used Valuation Methods in the Valuation of Contaminated Land

	Never	Rarely	Sometimes	Often	Always
ComSalcont	23	9	8	14	7
	37.70%	14.80%	13.10%	23%	11.50%
DepRepcont	22	5	17	8	9
	36.10%	8%	27.90%	13.10%	14.80%
PreRatecont	13	7	12	16	13
	21.30%	11.50%	19.70%	26.20%	21.30%
Incmetcont	22	8	13	15	3
	36.10%	13.10%	21.30%	24.60%	4.90%
SDmetcont	40	15	4	2	0
	65.60%	24.60%	6.60%	3.30%	0%
LVExtcont	36	14	10	1	0
	59%	23%	16.40%	1.60%	0%
DCFcont	39	11	8	3	0
	63.90%	18%	13.10%	4.90%	0%
Convalcont	44	8	6	2	1
	72.10%	13.10%	9.80%	3.30%	1.60%
HPMcont	48	11	2	0	0
	78.70%	18%	3.30%	0%	0%

Source: Field Data (2013)

In determining which stakeholder was more influential, the study revealed that the international oil companies (IOCs) are the most influential stakeholders in choosing a valuation method and also influencing valuation practice in the determination of damages due to contamination. On a Likert Scale, respondents were asked to state their level of satisfaction with the current practice. 7 (11.5%) respondents said the IOCs were very dissatisfied; 8 (13.1%) said they were dissatisfied; while 23 (37.7%) said they were much undecided; 11 (18.0%) said they were satisfied; while 12 (19.7%) said they were very satisfied (Figure 3 shows these results). This response is curious as the IOCs were said to be the most influential in the choice of valuation method in the damage assessment process and should be satisfied with the outcome of the process they have engineered.

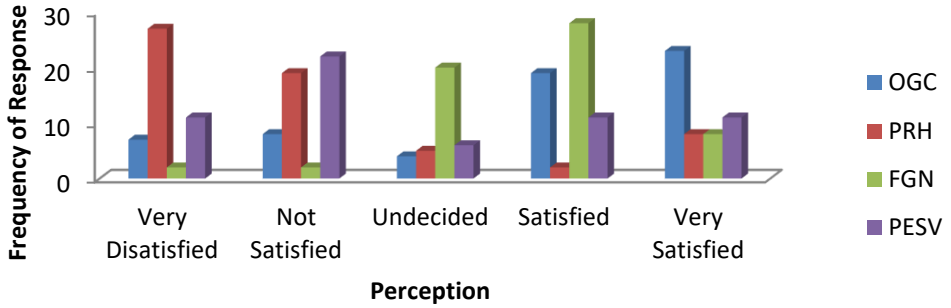

Figure 3: Stakeholder Satisfaction with Current Damage Assessment

Legend

OGC = Oil and Gas Companies (IOCs)

PRH = Property Right Holder (Landowners)

FGN = Federal Government of Nigeria

PESV = Professional Valuer

The responses showed that the property right holders are very dissatisfied with the damages assessed currently and would welcome a framework that will improve their present experience.

The Federal Government as a stakeholder has power, legitimacy and urgency and is thus a dominant stakeholder who not only prescribes rules and regulations for the oil industry, but also prescribes the valuation methods to be used and specifying compensation rates. It does appear that this is a very powerful stakeholder who is very satisfied with the damage assessment process, no doubt due to its power. The professional valuers were generally not very satisfied with the current damage assessment process and would welcome a framework that legitimises their role in the contaminated property valuation process. These questionnaire responses were corroborated by the expert valuers interviewed when one of them summed it thus "*The IOCs see the payment for damages as a privilege as they not only dictate the rates but also the amount they are willing to pay, sometimes against the recommendation of their consultant valuers."* Both the questionnaire respondents and the expert valuers interviewed indicated that the absence of a practice standard was responsible for the current practice.

Realising the absence of a practice standard as it obtains in advanced economies available to valuers in the Niger Delta in particular and Nigeria in general, it became necessary to examine if the practitioners would welcome such a standard. Respondents were asked if they agreed that

there is need for a Practice Standard that will specify the valuation methods that should be adopted for valuing contaminated Wetlands by indicating their opinion on a Likert scale with options as Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. Figure 4 shows the responses on the need for a practice standard.

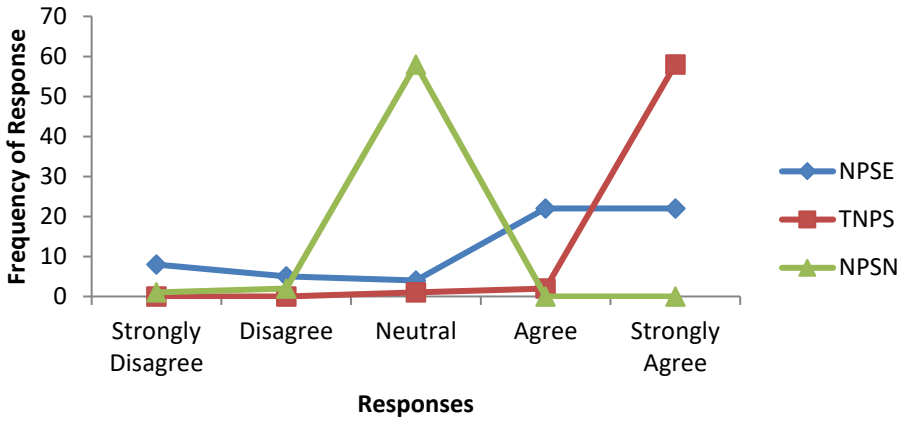

Figure 4: The Need for a Practice Standard
Source: Field Data (2013)

Legend
NPSE = No Practice Standard Exists
TNPS = There is Need for a Practice Standard
NPSN = No Practice Standard Needed

A sizeable majority of 44 (72.2%) strongly agreed that there is no practice standard existing. This response lends credence to the non-uniformity of approach in valuing contaminated wetlands to assess damages due to contamination and the dominance of the International Oil Companies (IOCs) and Government in choosing a valuation method to use in assessing damages. It also confirms a laissez faire approach in valuation practice among valuers which creates doubts about the relevance of the profession in the development of the region in particular and the country in general and in the management of oil contaminated lands; it also creates the vacuum being exploited by the IOCs to dictate what method that should be used for any particular type of valuation. A vast majority of 61 (100%) strongly agreed that there is need for a practice standard, contending that this would streamline the valuation practice, especially in the area of contaminated wetland valuation. The need for a practice standard calls for a framework that will guide all the parties identify their roles in the process of assessing damages due to contamination and confirm the multidisciplinary nature of contaminated land management. A

summary of the expert interview opinions was stated by one of the experts that "*there should be a framework and guideline defining the procedures to be adopted when a contamination occurs. This will also enable valuers value from both the polluters' and the claimants' viewpoints and make it easy for arbitration in case of any disagreement between the parties. This study is overdue since all the practice of valuation has been based on the mainland, neglecting the wetlands which are very useful. The current practice regards wetlands as being useless and the study should capture the economic potentials of wetlands."* There was no agreement between practicing valuers on which valuation method that should be adopted in assessing damages due to contamination, as there was constant under-cutting between firms as they contend for patronage by the IOCs when any contamination occurs, thus weakening the usefulness of valuation opinions in decision making. The main reason for the present quagmire is the absence of any valuation framework that will regulate the procedure and method those valuers may adopt in valuing contaminated wetlands, and the various professionals that will be required to conduct a comprehensive study of the contamination impact, which will be known to both land owners and the polluters alike, to produce an unbiased value and minimise disputations between them. Such a framework will guide valuers in undertaking the valuation of contaminated wetlands and also inform the polluters of the necessary protocols to follow in the event of any occurrence of a contaminating event. While existing literature describes in broad terms the various stages of investigations required for the valuation of contaminated land (Bell, 2008), and others have illustrated a framework focused only on non-market goods and contaminated ecosystems valuation from the public's perspective (Defrancesco *et al*, 2012), no single literature has integrated the various stages of investigation into a single framework designed to assess the dimunition of value from a property owner's viewpoint. Adopting the valuation methods according to their frequency of occurence, the methods were grouped either as property-based or wetlands-based methods and incorporated into the framework. This paper combines evidence from literature and results from field research to propose a novel framework that accommodates the peculiarities of a contaminated wetland in the Niger Delta region of Nigeria.

Figure 5 below shows the proposed composite valuation framework for valuing contaminated wetlands.

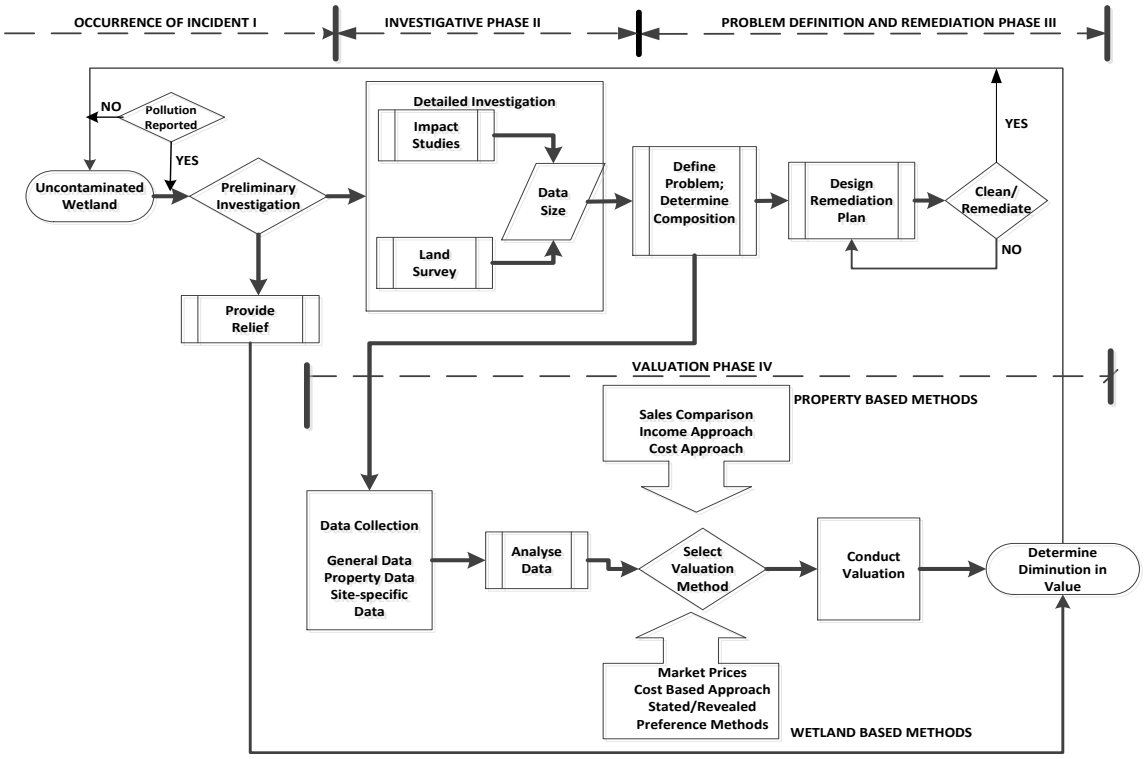

Figure 5: Proposed Framework for Valuing Contaminated Wetlands

8.1 Phase 1: Occurrence of Contamination

Land contamination is defined by the Environmental Agency (2004) in its broadest sense as a general spectrum of site and soil conditions which can include areas with elevated levels of naturally occurring substances, as well as specific sites that have been occupied by former industrial uses, which may have left a legacy of contamination from operational activities or from waste disposal, and also include areas of land in which substances are present as a result of direct or indirect events, such as accidents, spillages, aerial deposition or migration. Thus defined, contamination involves three basic components of contaminant, a receptor, and a pathway. A contaminant describes any substance in, on, or under the land with the potential to cause harm or to cause pollution of adjoining waters and may include crude petroleum and crude petroleum pipelines; a receptor which is something that could be adversely affected by a contaminant like people, an ecological system, real property, or a water body; a pathway which

is the route or means through which a receptor can be exposed or affected by a contaminant. Contamination usually impacts the surrounding environment.

8.2 Phase II: Detailed Investigation

Upon the confirmation of the veracity of the contamination report, the IOC will initiate a detailed investigation of the incident in compliance with the applicable laws. The first action here will be the identification of the Stakeholders of the incident, which will include the operators of the oil/gas field, the landowners/users, and the parties responsible for the incident.

The oil industry operations in the Niger Delta as in other parts of Nigeria is subject to certain laws such as the Oil Pipelines Act (Cap. 07, LFN, 2004), the Petroleum Act (Cap. P10, LFN, 2004), and the NOSDRA (Establishment) Act (No. 72, Vol. 93, 2006). There are other regulations like the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) of NNPC (2002), issued by the Department of Petroleum Resources (DPR). The DPR supervises all petroleum industry operations and enforces the other laws, while NOSDRA is a government agency responsible for compliance with the environmental laws affecting the petroleum sector.

8.3 Phase III: Remediation:

The actual remediation of the site commences when the results of the detailed investigation stage indicates the presence of concentrations of hazardous materials over the regulatory thresholds and thus define the nature and extent of the contamination and its remediation; it will continue until the concentrations of hazardous substances are reduced to their regulatory standards; and may continue until after the clean-up of the receptors. The results of this stage will inform the actual valuation process, as this stage provides the required input data that is necessary for determining the damages suffered due to the contamination.

8.4 Phase IV: The Appraisal Stage:

Whipple (1993) opined that fields of study like Valuation which are fundamentally healthy, exhibit a process of intellectual growth and development. This growth involves rethinking the process followed by professional valuers in executing valuation assignments to meet the needs of their clients, avoid malfeasance and enrich their practice, and this is what the proposed framework is designed to achieve. This is necessitated by the cry of inadequacy of the

compensation paid as damages due to oil pollution contamination and a general feeling that traditional valuation methods were not serving clients' needs and the need to provide a protocol for defining and solving valuation problems within a logically coherent frame of reference. To do this, the valuer is required to follow a protocol that entails the definition of the problem; determination of the land composition; data collection and verification; analysis of data; selection of the appopriate valuation methods and the valuation of the contaminated wetland. The details of these steps are contained in the Appendix.

Conclusion:

This paper sought to propose a framework for valuing contaminated wetlands as an aid to managing such contaminated lands. A questionnaire survey of valuation firms, found that there is a lot of discontempt among the stakeholders of a contaminated wetland and the adoption of property-based valuation methods was found to be inappropriate for wetland goods and services that are not usually marketed. Also professional valuers adopt property based valuation methods because they are not skilled in wetland valuation methods and it is suggested that only a composite valuation method that combines the property based valuation methods with the wetland based valuation methods can adequately capture the value of contaminated wetlands and aid the management of such lands. This paper adopts this basis in proposing a framework that reflects the multidisciplinary nature of the contaminated wetland valuation procedure and debunks the notion that such valuation is the preserve of only the professional valuers. While the case study was drawn from the Niger Delta of Nigeria, the proposed framework will be useful to any region where a wetland exists and enable Valuers to update their valuation skills to include such environmental goods and services and the various methods of valuing such economic resources in addition to their training in valuing the built environment.

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APPENDIX

The details of the various steps making up the Appraisal Stage are as follows:

8.4.1 Definition of Problem: A valuer retained to advise on the value of a contaminated wetland or any property, needs to first ascertain what the client's problem is and in the case of a contaminated wetland, this might be to enable the client know the damages suffered due to the contamination. Graaskamp (1992), stated that the definition of the valuation problem leads in turn to the definition of the most appropriate value sought by the client. Coleman (2006)

indicated the elements necessary for problem identification to include (1) client; (2) the intended use of the valuation report; (3) the intended use of the valuation opinion and conclusions; (4) the type and definition of value; (5) effective date of the valuer's opinion and valuation; (6) the subject of the assignment and its relevant characteristics; (7) assignment conditions like any assumptions made about the title and rights that are the subject of the valuation which may be intrinsic to the definition of the problem or externally imposed like a restrictive covenant.

8.4.2 Determine Land Composition and Use:

This is an extension of the task of defining the subject of the valuation assignment captured under problem definition above. This will entail stating the overall size of the contaminated wetland and the size of each component and the current uses and a confirmation of the legality of such uses. To be able to source for comparable data, the valuer will need to determine the alternative uses of the site and the possibility of securing legal permits to use the site for such alternative uses and the financial feasibility of doing so. The valuer needs to confirm that the property is physically suited to the use or the practicability of being adapted to the use. The Niger Delta Wetlands being of two types namely coastal and fresh water wetlands provide numerous goods and services that have an economic value, not only to the local population living in its periphery but also to communities living outside the wetland area. They are important sources for food, fresh water and building materials and provide valuable services such as water treatment and erosion control. Salau (1993) posited that there are 46, 000 plant species, 205 of which are endemic and approximately 484 plants in 112 families in the region, while Kadafa (2012) stated that a large population of the Niger Delta survive on services provided by the Niger Delta wetland like crabs, fish, shrimps, periwinkles, cockles, molluscs, and animals and birds.

8.4.3 Data Collection and Verification:

Data will be required to cover both general data and site or property specific data, some of which may already exist in the valuer's records and some may be collected afresh. A valuer practising in the Niger Delta, will maintain files containing regional, city and neighbourhood data for the area in which they customarily practice, local construction costs, and potential comparable properties may also be available. Where this is not, the valuer needs to collect general economic data at the national, regional, city, and neighbourhood levels. In some cases international data

may also be collected. The data that will be relevant will relate to social, economic, governmental, and environmental factors affecting the subject wetland. Specific data on accessibility of the site to surrounding transportation routes and distance to transport termini will be considered, so also any potential conflict in the means of accessibility will be mentioned. The locational characteristics will be considered to understand the nature of the linkages of uses to the site.

Site/Property-specific data or data more directly relevant to the contaminated wetland being valued and to comparable properties will also be collected. For the land itself, it will include the dimensions, slope, exposure, soil conditions, drainage and the like. Improvement data starting at the boundaries and working inwards will be recorded including a full description of any buildings or structures like fish ponds etc. effort must be made to ascertain the age of any structure to be able to determine approximate cost of construction and depreciation and income and expense data; utilisation histories and every other information that ordinary buyers might likely require to make a decision should be collected.

8.4.4 Analysis of Data:

The analysis will involve separating the data into those applicable to the upland component and those applicable to the wetland part, and thoroughly interpreting the strengths and weaknesses, the environmental conditions of the site, and interpreting the significance of the data to lay a foundation for selecting the best alternative use. For the upland part, the various data collected on the developed structures on the land encompassing its structure, measurements, description, depreciation and use will be assembled together with those of any comparable properties collected. As the valuer is analysing the subject property, he will also analyse suitable comparables where available, to be able to compare and extract market evidence of values. For the wetland portion, having collected both general and specific data, the valuer will collect supply and demand data characteristic to the most probable market for the wetland. This will be analysed to determine the value contribution of each component of the wetland and every income generating use or potential use of the wetland. It will be necessary to establish as much as possible the inventory of goods and services generated by the wetland and the potential gainers or losers from the presence or absence of the wetland in its present state as well as establish the potentials in the future. The analysis of data on contaminated wetlands requires a complete

knowledge of the contamination life cycle, which according to Bell (2008) and Defrancesco *et al* (2012), commences from (1) the occurrence of the contamination event; (2) the assessment of the extent and impact of the contamination on the environment, including an estimate of the cost of assessment and the apportionment of remediation responsibility; (3) the remediation or repair stage; to (4) the Post-remediation Stage.

8.4.5 Selection of Valuation Methods:

Cognisant of the composition of the wetland, the valuer selects from the array of valuation methods available for valuing both marketable and non-marketable goods/services. Two broad groups of methods consisting of the normative methods taught to valuers and referred to as 'Property Based Methods' and the ecologists' methods referred to as 'Wetland Based Methods' are available to the valuer. Property Based Methods like Sales comparison or Market Approach; Income Capitalisation Approach; and Cost Approach, and while Wetlands Based Methods include Market prices Approach; Cost-Based Approaches; Stated Pretences Methods; and Revealed Preferences Methods.

While the market goods/services could easily be valued with the valuers normative methods, it is not easy to value non-market goods/services. Market goods/services could easily be valued since a market exists for them and methods such as the property-based methods and the market prices and cost based approaches from the wetland based methods can be used. These market based methods rely mostly on historical information on market prices (Ulibarri and Wellman, 1997). For non-market goods/services, there is no market data to rely on and the valuation methods adopt indirect estimates of people's willingness to pay or accept for a good/service like the revealed or stated preferences methods of hedonic pricing or contingent valuation methods respectively. In view of this mixed grill nature of wetlands, this paper proposes the selection of a valuation method that will criss-cross the property and wetland based methods of valuation, selecting the most appropriate in each case, and combining to produce a composite method for use in determining the diminution in value of a contaminated wetland.

8.4.6 Valuation:

Contamination of natural resources results in some form of disaster to the environment. Such disasters may be land subsidence, flooding, and environmental pollution. Environmental

degradation necessitates the payment of damages to those whose properties have been affected by those who cause the damage, where they can identify and accept liability for the damage whether voluntarily or legally induced. Compensation in the Niger Delta, has been related to Compensation payments for compulsory acquisition of land for oil and gas development (Ogedengbe, 2007, Akpan, 2006, Nuhu, 2008, Kakulu, 2008) Most authors agree that the resulting compensation is grossly inadequate but do not recommend any method that will generate an adequate compensation.

Generally, the traditional valuation techniques are limited in their assessment of damages due to contamination, especially when valuing real property subject to environmental contamination such that is prevalent in the Niger Delta. McLean David and Bill (1998) advanced certain reasons for this limitation to include: 1) there is often a contracted market for residential properties that have been exposed to short- or long-term contamination, including limited recent or even long- term sales history; 2) there is limited awareness or knowledge among prospective buyers of the extent of the contamination, its risks and current status; and 3) knowledge about such factors can spread unevenly throughout the population, influenced by many factors, and changes in property values reflecting contamination may occur unevenly over time.

Jackson (2001) posits that the literature available on the valuation concepts and methods for valuing the effects of environmental contamination on real estate relates to income-producing, commercial and industrial real estate and that only very few empirical studies of contaminated real estate exist. The available literature has focused on how existing appraisal methods can be adapted to estimate the impact of contamination on value. This scenario is worse in the Niger Delta where most of the contaminated land subsist in rural communities where there is the near absence of a property market and thus lies almost outside the purview of professional valuers' practice. Jackson (2003), asserts that most assignments involving contaminated properties are for litigation and suggests that any valuation method that is to be used, should be one that has gained general acceptance in the appraisal profession or the section of the profession that specialises in contaminated property valuation. In view of the nature of the property market in the region and since few valuers handle contaminated properties in the Niger Delta, it is difficult to adopt their valuation methods for general applicability. Efforts is made to adopt from the available methods

in use and modify them for application to the region. Jackson lists the valuation methods accepted professionally for valuing contaminated properties as including the following:

- Analysis of environmental case studies;
- Paired sales analysis of potentially impacted properties;
- Use of market interviews to collect data and information used in other approaches or to support and supplement the results of other analyses
- Multiple regression analysis of potentially impacted neighbourhood areas or properties in proximity to a contaminated source;
- Adjustment of income and yield capitalisation rates to reflect environmental risk premiums in an income capitalisation analysis.

Uba (2010) stated that when contamination has been identified, quantified, and the remediation costs have been identified by a qualified expert, the valuer may be able to develop an opinion of market value that considers the negative impact on value, and provided a list of notes to guide valuers valuing contaminated properties. This includes:

- An estimate of value as if the contamination has been removed, i. e. as if free and clear of contamination;
- The valuer must rely on the expert advice of environmental and other qualified experts with proper disclosure of the experts' findings, opinions and conclusions on the contamination;
- Realise that the estimated diminution in property value may be more than the estimated costs to remediate the property;
- The valuer may prepare the valuation opinion subject to a hypothetical condition that the property is not impacted by contamination if requested to do so but with full disclosure of the hypothetical condition and the likely effect of the hypothetical condition on the estimate of value.

The IVSC (2007) in its guidance, advices valuers to note the ‘peculiarities’ of the real estate market in reporting their values, especially:

- The fact that it is the market’s reaction to the contamination that the valuer must consider and measure;
- Where market value is sought, the valuer should reflect the market effect of the particular condition or circumstance;
- The valuer must research and reflect the effects of the contaminant on the property in its market;

The valuer must also note the difference between general public perception and the actual market effects for the presence of the contamination, and avoid generally held public perception which are erroneous but should conduct competent research and reflect market attitudes towards the contamination. Valuers’ search for appropriate valuation methods have concentrated on the normative property based methods avoiding any contribution from environmental or ecological economics. Since most of the goods and services derived from the Niger Delta are outside the definition of real property but constitute a component of the income of the property owners, it is reasonable to examine methods being used to value such goods and services with a view to adopting any that may complement the output of the property based methods in the assessment of damages due to contamination. The proposed framework will draw appropriate methods of valuation form wetland based and property based methods to determine any diminution in real property value that occurs as a result of contamination. Such diminution in value will constitute the compensation that should be paid to those who suffer damages as a result of any contamination.