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Review of the impact of obsolescence on residential property values

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Abstract
A cursory examination of recent studies shows that the place of obsolescence is not well defined while considering the determinants of residential property values notwithstanding its lethal effect on real properties generally and residential property values in particular. Hence, the aim of this study is to review relevant literature on the impact of obsolescence on residential property values. The study makes use of secondary data by reviewing previous studies centering on the concept of obsolescence, residential property values and the relationship that exists between them. High impact journals and other relevant publications were reviewed accordingly. Enquiries into previous studies show that not enough attention is given to the consideration of obsolescence as an attribute of residential property value determinant. However, there are studies dwelling on causes of economic obsolescence and their impacts on housing values like effect of landfill, sewage system, industrial plants, dump sites and the likes on property values. It is hereby recommended that researchers especially in real estate should embark on more meaningful studies on the effects of obsolescence, as a conceptual attribute, on residential property values. This study is meant to serve as awakening call to valuers to take adequate cognizance of the impact of obsolescence on their valuation assignments.

Keywords: estate life cycle, impact, obsolescence, residential property values

1. Introduction
Obsolescence has been described as a very difficult concept to define probably due to its diverse nature (Smith, 2004; Mansfield & Pinder, 2008) [51, 29]. However, one basic fact about the concept is that its appearance or manifestation in buildings; be it social, physical, functional or economic has the tendency of negatively impacting on the values of such property especially where inefficiency is incorporated into its management. Bearing in mind the key objective of property development and management – to obtain optimum return - any negative impact on the building may definitely jeopardize this objective (Thorncroft, 1965) [54].
Another important issue is the treatment of obsolescence in property valuation process. Studies have shown a remarkable deficit in this regard (Smith, 2004; Mansfield & Pinder, 2008) [51, 29]. This manifests in the dearth of research in the area of the influence of obsolescence on property values. At best, most of the published studies (Nelson, *et al.* 1992; Knaap, 1998; Bateman, *et al.*, 2001; Selim, 2008) [32, 27, 7, 48] center on the causes or symptoms of obsolescence like effect of pollution, planning control, landfill or solid waste deposit site, aircraft noise pollution and sewage plant among others on property values. Most of the studies agree with the general hypothesis that obsolescence is capable of negatively impacting on property values.
In the light of the above, this paper attempts to review previous studies based on the influence of obsolescence on residential property values. Residential property is singled out of other classes of real property (industrial, commercial, agricultural and institutional) due to the multiple roles it plays in human endeavor especially provision of living accommodation for human and their luggage, investment opportunity and recreation among others. The anticipated policy implication of the study is unearth the devastating influence of obsolescence on property values and to make a clarion call to realtors (academics and professional) to update studies on this subject in the areas of its treatment in valuation process as well its impact on residential property values. Area of future research is to carry out an empirical study on the influence of obsolescence on residential values which currently stand as a key limitation to this study.
In order to do adequate justice to the purpose of this study, the article is sub-divided into five (5) sections namely: section one deals with the introduction while section two makes a detailed explanation on obsolescence as a concept. Section three expatiate on residential property values while section four gives an account on the review previous empirical studies relating to the effect of obsolescence. The final section (5) gives the summary and conclusion to the review.

2. Concept of obsolescence
2.1 Meaning of obsolescence and estate life cycle
The word obsolescence can be said to be ambiguous as the meaning tends toward the type one is describing at a particular point in time (Mansfield & Pinder, 2008) [29]. For instance, from the physical obsolescence, it can be defined as the loss in the usefulness of a property or assets as a result of wear and tear. Whereas, viewing obsolescence from the economic angle, it is referred to as inability of a property to bring forth or generate the expected income (a reduction in value) as a result of an internal or external defect. Likewise, functional obsolescence relates to inability of a building to perform its expected function efficiently as a result of defect in design; for instance a ten (10) storey building without a functional lift. Furthermore, social obsolescence sees obsolescence as a situation whereby a property (notwithstanding the fact that it is newly built) is rendered inhabitable as a result of not meeting the minimum requirement of the development control regulations or such

building being declared as hazardous to human habitation; may be for not observing the right of way or setback.

However, from the foregoing, it can be deduced that obsolescence in buildings has to do with wear and tear, inability of a building to perform its original purpose, internal and external forces leading to reduction in values and where a building is abandoned as a result of not meeting building regulations.

Essentially, for the purpose of clarity, a good understanding of obsolescence requires touch-lighting its origin. Obsolescence in building emanates from the concept of estate life cycle. The rhythm and manner by which an estate becomes obsolescent and renewed again is referred to as estate life cycle. In other words, the estate life cycle is establishing the fact that a building is capable of being given birth to, grow, become old and capable of dying. The various stages involved in estate life cycle will further expatiate its meaning. According to Thorncroft (1965) [54]; Baum (1991) [8]; Abrahamson (2015) and Mansfield & Pinder (2008) [29] there are basically five (5) stages involved. These include: predevelopment stage, newly developed stage, middle age, old age and total obsolescence stage.

The pre-development stage covers period of acquisition of land or site for development, design, financing arrangement and other jobs needed to be carried out to the completion of the building construction. The newly developed stage refers to the initial stage of development. This stage is usually unaffected by obsolescence as the building is expected to enjoy the beauty of newness. However, at this stage, the maintenance culture employed will determine how soon obsolescence would set in. Middle age is usually the longest stage in the life of an estate and can be extended to last almost permanently. It is the stage where the advantage of being new disappears and the building settles down to its long-term level of utility and value during the period.

Old age stage represents the stage when the building continues to sink rapidly in status; it usually signifies the end of the middle age. It also shows the sign of obsolescence, physical deterioration adaptation to poorer type of the use than that for which it has initially designed out of date fitting and finishing and so on. Total obsolescence which represents the final stage of the estate life cycle is the stage when the estate has little or no value as it stands. On a normal setting, clearance and redevelopment follows quickly, though many factors may prevent this like lack of capital to execute new development (Bryson, 1997) [9].

2.2 Types and management of obsolescence

Efforts have been made by various authors to identify different types of obsolescence (Smith, 2004; Mansfield & Pinder, 2008; Thorncroft, 1965; Olajide, 2017) [51, 29, 54]. These can be categorized under major and minor. The major ones are basically five (5). They are: physical, functional, economic, social and environmental. The minor classification is unexhausted. Physical obsolescence occurs when a property loses value due to old age, gross mismanagement and physical neglect resulting in deferred maintenance that is usually too costly to repair. Functional obsolescence occurs when a property loses value due to its architectural design, building style, size, outdated amenities; local economic conditions and changing technology. Economic obsolescence manifests when a property loses value because of external factors such as local traffic pattern changes or the construction of public nuisance type properties and utilities such as sewer treatment plant, prison, and refuse dump site on adjoining properties.

Social obsolescence, which is otherwise called legal obsolescence, stems from the introduction of new legislation or new standards controlling matters such as health, safety, and fire control, which in extreme cases may render a building obsolete. CALUS (1986) [10] and Baum (1989) [8] were of the view that changes in social needs might result in occupiers demanding for high and compatible image, good neighborhood and amenities. Legal obsolescence occurs where a building fails to meet current legislation requirement and the costs involved in bringing the building up to the required standard are prohibitive. In this case, legislation will advance demolition beyond the building's physical life. Examples include asbestos and other hazardous materials to health are now prohibited in new buildings and where they occur in existing building; they need to be either removed or provided with sealed protection systems. The general condition of a building may in some cases make this financially prohibitive, even where grants for their removal are available, resulting in demolition. In the case of environmental obsolescence, Medhurst (1969) [31] suggested that environmental obsolescence of a whole neighborhood may occur when the conditions in a neighborhood render it increasingly unfit for its current use. Changes in the character of an area may make a building unsuitable for its original intended use. Environmental obsolescence will normally be of greater relevance to depreciation of land than to the depreciation of buildings. Environmental change such as high pollution, road congestion and urban decay causes environmental obsolescence. For example, buildings in a residential neighbourhood may suddenly become obsolete when the adjacent site is used for industrial use. Disturbances from factory engines and air pollution will deter tenants from staying and the building revenue will start to decline.

Other classifications of obsolescence include spiritual (when a building is render obsolete due to spiritual injunctions); technological obsolescence (when the building in no longer technologically superior to alternatives and replacement is undertaken because of lower operating costs or greater efficiency); locational obsolescence (when an area and the property located in it suffers from devaluation because it is considered less fashionable or attractive by occupiers [Bryson,1997]) [9]; aesthetic obsolescence (buildings may deem unacceptable by occupiers if the appearance is outdated and incompatible with their corporate image); external obsolescence (when some outside forces affect the real estate property like if the neighbourhood around the property goes downhill, then the value of such property may go downhill as well).

Considering whether obsolescence is curable or incurable, a deficiency is associated with the lack of feature that is associated with what is typical in the area (Mansfield & Pinder, 2008) [29]. The key difference between curable and incurable obsolescence is whether the cost to cure results in an incremental increase in value. If it does, it is considered curable and vice versa. In real estate appraisal, one of the major steps needed to be taken in cost approach to valuation is to estimate the structure's accumulated depreciation (Gyamfi-Yeboah & Ayitey, 2009; Reilly, 2012) [21, 43]. Out of the various forms of depreciation and value adjustments that should be carried out; two of these adjustments involve

the calculation of curable and incurable physical deterioration of the structure. In treating curable physical deterioration, the estimation of value to assign this component simply involves taking inventory of what needs repaired, such as weather stripping, painting and window replacement among others and assigning it a market cost to remedy. This should only include items if the gains on value resulting from the repair will offset the cost to repair. Whereas in treating incurable physical deterioration where the loss resulting from wear and tear for which the cost of repair would outweigh the increase in value from repair, it must include all physical deterioration not included in the curable category (Smith, 2004) [51]. Incurable physical deterioration is categorized into short-term and long-term. Short-term includes items with an expected life shorter than that of the building while long-term includes those items that have an expected life equal to or longer than the expected remaining life of the building.

The rapid deterioration of buildings and their components can be attributes to many different causes (Thomsen & Van der Flier, 2011; Pinder & Wilkinson, 2001; Grover & Grover, 2015) [53, 39, 20]. an emphasis upon initial building costs without considering the consequences of costs in use; inappropriate design and detailing of buildings and their components; use if materials and components that have insufficient data concerning their longevity; constructional practices on site that were poorly managed, supervised and inspected; a lack of understanding of the various mechanisms of deterioration; insufficient attention given to the maintenance the building stock; and inappropriate use by owners and occupies to mention a few. However, the rate of physical deterioration can be controlled by the designer through the correct choice of material, methods of construction and appropriate standards of maintenance, obsolescence cannot, other than through the ability to provide a flexible and adaptable design solution to facilitate easier adaptation and renewal at some later date. Thorncroft (1965) [54] and Nutt (2000) [33] identify the following measures to controlling obsolescence: sound maintenance, simplicity in design and layout, forward planning, elasticity, preservation of homogeneity, and preservation of use balance.

3. Residential property values

3.1 Conceptual Definition

For many households, ownership of residential property does not only offer an alternative for a place to live in; they also represent the bulk of assets in these households' portfolio. Indeed, in most developed countries, real estate forms the greatest component of private households' wealth (Selim, 2008) [48]. As a result, the value of their houses has a major impact on households' consumption and savings opportunities (Case *et al.*, 2004) [12]. House prices are therefore of great interest to real estate developers, banks, policy makers or, in short, the general public as well as to actual and potential home owners (Schulz & Werwatz, 2004) [46].

The significance of residential real estate properties to the economy of a nation and the various stakeholders cannot be over-emphasised. This class of asset contributes to the gross domestic product of a nation, whereas some stakeholders (individuals and corporate) store their wealth in real estate, making the value of real estate properties to be of great importance to its holders (Abidoye & Chan, 2016) [1]. Real estate property serves as consumption (owner-occupier) and investment (investors) goods to its holder (Chin & Chau, 2002) [13]. Residential real estate property is complex in nature; that is, it is made up of many unique sets of characteristics that influence its value wherever it is located (Sirmans *et al.*, 2005) [50]. Previous studies (Tse & Love, 2000; Mbachu & Lenono, 2005; Adegoke, 2014) [55, 30, 3] have reported that the value of a real estate property is influenced by several independent attributes. The impact of these attributes on property values is perceived differently by the different stakeholders because of the heterogeneous nature of real estate properties. The characteristics of the property market (imperfect, heterogeneous, complex legal interest, land laws and regulations among others) make the services of a real estate professional inevitable to a rational real estate investor/stakeholder (Shapiro *et al.*, 2012).

Studies conducted in different parts of the world (Tse & Love, 2000; Kauko, 2003; Oloke *et al.*, 2013; Famuyiwa & Babawale, 2014) [55, 26, 36, 17] have reported that property value is determined by some sets of attributes which have been categorised into groups. The classifications of these attributes as posited by Chin & Chau (2002) [13] are locational, structural and neighbourhood factors. This is also in agreement with the views of other scholars such as Pozo (2009) [40], Ajide & Alabi (2010) [4], Babawale *et al.* (2012) [6]. Wong *et al.* (2002) [57] mentioned that property attributes are classified into three classes, namely, location attributes (access to social and economic facilities), structural traits (floor area, floor height, etc.) and neighbourhood characteristics (neighbourhood quality). From another perspective, property value determinants were grouped into three categories by Wen *et al.* (2005). Property value has been established to be a function of some sets of attributes in the real estate domain and these attributes are inherent attributes, neighbourhood characteristics, accessibility and environmental quality (Choy *et al.*, 2007) [14].

The importance attached to real estate property by different stakeholders has necessitated a series of studies conducted in different economies of the world to investigate the attributes that influence property values and the dynamics of property values in these real estate markets. Moreover, the price of real estate properties in different international real estate markets may not be similar because of differences in the cultural, economic, financial and legal structures of different countries (Jenkins, 2000; Olayiwola *et al.*, 2005) [24, 35]. Generally speaking, the extant literature has established that the attributes that affect property value are classified into three broad groups–locational, structural and neighbourhood factors.

The residential property market is defined as one where housing services are allocated by the mechanism of supply and demand. One of the characteristics of the housing market that is different from markets of goods and services is the inelasticity of housing supply. Housing services are one of the most expensive household expenditures (Selim, 2008) [48].

The valuation of residential real estate is required to provide a quantitative measure of the benefits and liabilities accruing from the ownership of the real estate. Valuations are required, and often carried out, by a number of different stakeholders in the marketplace such as real estate agents, appraisers, assessors, mortgage lenders, brokers, property developers, investors and fund managers, lenders, market researchers and analysts and other specialists and

consultants. Market value is estimated through the application of valuation methods and procedures that reflect the nature of property and the circumstances under which the given property would most likely trade in the open market (Pagourtzi *et al.*, 2003) [37]. Numerous methods are available to estimate market value in the literature. Pagourtzi *et al.* (2003) [37] classify these methods into two categories: traditional and advanced. Traditionally, these methods include; direct capital or rental comparison, investment method, cost or contractors' method, profit method and residual method among others. The advance methods refer to new methods that emanate as a result of deficiencies attributed to the traditional methods.

3.2 Hedonic pricing model

In real estate valuation and house market study, residential property prices and rental value are generally analyzed by hedonic model based on micro economic theory. Hedonic model examines the effect of characteristics of goods on their prices.

The term hedonic was adopted to describe "the weighting of the relative importance of various components among others in constructing an index of usefulness and desirability" (Goodman, 1998) [19]. Rosen (1974) [45] defines hedonic prices as "the implicit prices of attributes and are revealed to economic agents from observed prices of differentiated products and the specific amounts of characteristics associated with them" (Ustaoğlu, 2003) [56]. Rosen (1974) [45] comprehensively laid down a theoretical foundation for determining the bid price, or implicit value of the attributes of a commodity for different consumers.

Over the past three decades, the hedonic-based regression approach has been utilized extensively in the housing market studies to investigate the relationship between house prices and housing characteristics (Selim, 2011) [47]. The primary reasons for such extensive application include analyzing household demand for these characteristics and the construction of housing price indices (Can, 1992; Sheppard, 1999) [11, 49]. However, this approach is subject to criticisms arising from potential challenges relating to fundamental model assumptions and estimation such as the identification of supply and demand, market disequilibrium, the selection of independent variables, the choice of functional form of hedonic equation and market segmentation. These problems have been of great concern in the literature as enunciated by Sheppard (1999) [49], Malpezzi (2003) [28] and Fan *et al.*, (2006) [18].

Hedonic price model is based on Lancaster (1966)'s consumer theory. Since this theory has been extended to the residential market by Rosen (1974) [45], residential hedonic analysis has become widely used as an assessment tool and for property market and urban analysis (Selim, 2008) [48]. The regression of residential property prices on a variety of property specific and neighborhood descriptors evaluates their marginal contribution, also called implicit or hedonic prices. A comprehensive treatment of hedonic price theory is provided by Rosen (1974) [45]. A theory of hedonic prices is formulated as a problem in the economics of spatial equilibrium in which the entire set of implicit prices guides both consumer and producer locational decisions in characteristics space.

Sirmans *et al.* (2005) [50] reviewed 125 studies that have adopted the hedonic pricing model to measure the influence of property characteristics on residential property values in the USA. The authors extracted the attributes that appeared often in the literature in terms of their number of appearances, number of positive impact, number of negative impact and the number of times not significant. The analysis shows that age is the most occurred variable and, expectedly, its negative significance on property value was recorded in 63 instances out of the 78 appearances. Square feet, garage space and number of bathrooms and bedrooms were positive in almost all of their appearances.

4. Review of empirical studies

Effort is made in this paragraph to systematically review previous empirical studies that center on the influence of obsolescence on residential property values. Ridker & Henning (1967) [44] conducted a study on the determinants of residential property values with special reference to air pollution. Using air pollution as the key value determinant, the study found that air pollution variables turned out to be a relatively significant variable in explaining residential property values. The result of this study is in tandem with the study conducted by Anderson & Crocker (1971) [5] where the result showed that land rents would vary inversely with air pollutant dosages and that pollution is a source of disunity especially where it negatively modulates the utility obtained from other goods. Smith & Deyak (1975) [52] in measuring the impact of air pollution on property values posited on the need to provide information on the benefits associated with improvements in air quality for rational environmental planning which has generated considerable interest in the empirical analysis of air pollution's effects on property values. From the foregoing, it can be summarized that, air pollution, a symptom or cause of obsolescence is capable of impacting negatively on residential property values.

From another perspective, Bateman, *et al.* (2001) [7] examined the effect of road traffic on residential property values which dwelled on hedonic pricing, submitted that due to the negative effect of road traffic on residential neighbourhoods which by extension reflects in the property values, that the provision of the law should be followed by paying adequate compensation to households where the physical factors associated with a new road lead to a reduction in property price. Closely related to this are the studies conducted by Collins & Evans (1994) [16] and Pennington, *et al.* (1990) [38] which was based on the influence of Aircraft noise on residential property values. Their results found that though effect of noise were statistically insignificant, properties in such areas affected by noise of aircraft could cause lower market prices than others not affected. However, noise was found to be inextricably bound up with other more important neighbourhood locational variables.

Furthermore, landfills have been found to have effect on residential property values. In the work of Nelson, *et al.* (1992) [32], empirical results indicate that the landfill adversely affected home prices in the range of 12 *per cent* at the landfill boundary and 6 *per cent* at about one mile. Beyond about 2-2.5 miles, adverse effects were negligible. However, it is expedient to add that the findings have important implications for the siting of new landfills near an area within the path of future development. In the same vein Reichert, Small & Mohanty (1992) [42] concluded that landfills would likely have an adverse impact upon housing values especially when the landfill is located within the

several blocks of an expansive housing area. The study found the negative impact between 5.5-7.3% of market value depending upon the actual distance from the landfill.

Past empirical studies have also shown that social obsolescence (development control) is capable of influencing residential property values. The literatures have it that government regulations are capable of either impacting positively or negatively on residential property values. This was emphasized in Jaeger (2006) where in the context of laws like Oregon's Measure 37, requiring that landowners be compensated if regulations reduce property values, the economic effects of land use regulations on property values were being widely misinterpreted because two very different economic concepts were being confused and used interchangeably. The first concept according to the study is "the effect of a land use regulation on property values" which measures the change in value when a regulation is added to many parcels. The study identified second concept as "the effect of an individual exemption, or variance, to an existing land use regulation," which measures the change in value when a regulation is removed from only one parcel. The effect of a land-use regulation on property values can be positive or negative, whereas removing a land-use regulation from one property can be expected to have a positive effect. Indeed, many land-use regulations actually increase property values by creating positive "amenity effects" and "scarcity effects." As a result of these differences, a positive estimate for removing a land-use regulation cannot be interpreted as proof that the other concept was negative. Despite this, a positive value for an individual exemption to a land-use regulation continues to be interpreted as proof that compensation is due under Oregon's Measure 37. Indeed, the study believes that this mistaken interpretation may be partly responsible for public sentiment that land-use regulations according to the study tend to reduce property values. In the same vein, Ihlanfeldt (2007) [22] investigated the effects of land use regulation restrictiveness on house and vacant land prices. The results presented in this study suggested that land use regulation has important effects on the prices of housing and vacant land. However, the results also suggested that estimates of these effects may be biased if the measure of land use regulation restrictiveness is treated as exogenous to housing price or if estimated effects are not allowed to vary by market setting. Evidence was also provided that newly constructed homes are larger where regulation restrictiveness is higher.

From another perspective, in the study of Katz & Rosen (1987) [25], their analysis documented the proposition that land-use regulation increases housing costs in California cities. First, the study found a positive relationship between the degree of regulatory stringency and housing prices for both owner-occupied units and rental units. This relationship was evident in both the 1990 and 2000 cross sections, as well as in the changes in housing prices and rents over the decade. The study also found evidence that new housing construction was lower in more regulated cities relative to less regulated cities. Holding constant the change in the price indexes over the decade, the report found that changes in the housing stock arising from new construction are smaller in more regulated cities. While this relationship may arise from unobserved differences in the changes in housing demand over the decade, this is unlikely. As the initial results suggested, housing price was seen to appreciate in more regulated cities exceeded the comparable price changes in less regulated cities. Thus, those cities with the greatest increases in housing demand experienced the lowest increases in new housing supply. The strongest evidence of the impact of regulation on housing costs in line with the study's result came from the estimates of the supply elasticity of housing for regulated and unregulated jurisdictions. Using an exogenous predictor of changes in housing demand, the study found that the responsiveness of the housing stock via new construction was weaker in more regulated cities, relative to less regulated cities. Moreover, the difference in responsiveness was seen to be greatest for the supply of multi-family housing units, the source of supply that is most frequently the target of regulation (Quigley & Raphael, 2005).

Considering the impact of depreciation and obsolescence on housing prices, Smith (2004) [51] submitted that all things being equal, the value of real estate structures will decrease with age because of depreciation and obsolescence. Economic depreciation was identified as the potential to reduce both income and the market value of a property, and that it is a function of both physical deterioration and functional obsolescence. Accurate estimates of depreciation, according to the study, are important to investors, owner occupants and housing policymakers for a variety of reasons including: estimation of the useful lives, projecting potential income, assessing risk premiums and forecasting maintenance requirements of specific properties. The study therefore addressed a set of identified limitations in the literature on economic depreciation of real property. The relationship between age and price could now be understood to be more complex than could be conveyed in a traditional linear association because there are a number of potential factors. Very old houses, for example, may have a premium attached to the price, because of uniqueness and/or their proven ability to survive, which may be linked to quality. The measurement of depreciation was seen to have taken on new and expanded forms as researchers recognize that depreciation of real properties is dependent on numerous locational and temporal factors.

The study conducted by Mansfield & Pinder (2008) [29] which dwelled on the characteristics and impacts of economic and functional obsolescence on valuation practice posited that viewing obsolescence in all its forms, is one of the key negative drivers of property depreciation and has the potential to have a significant and immediate impact upon the investment value of property in all operating sectors. The general conclusions of the study are that despite the need to be more explicit in valuations, current methods are unable to address such detail. The guidance and advice offered by professional bodies need to be thoroughly revised. The study hoped that the progress being made in methodology would be incorporated in directed guidance to practitioners. The may thrust of this study can be said that depreciation and obsolescence if not properly managed can negatively affect residential property values.

Reilly (2012) [43] in a study recapped the rapid technological changes which had caused many industrial, commercial and even residential properties to experience obsolescence. The study pointed out that the prolonged weak global economy had caused many industrial and commercial properties in particular to experience economic obsolescence. Taxpayer property owners are therefore persuaded to recognize such obsolescence in the valuation of their properties and where

appropriate appeal their *ad valorem* property tax assessments. The study further made a special reminder or appeal to the valuers to take into consideration the effect of obsolescence on the assessed property so as to avoid misleading assessment. The study however proffers a method of assessment as summarized in Figure 1 that values in terms of depreciation arising from physical, functional and economic obsolescence must be calculated and adequately deducted from the gross assessed value before the tax rate is applied especially when using cost method of valuation.

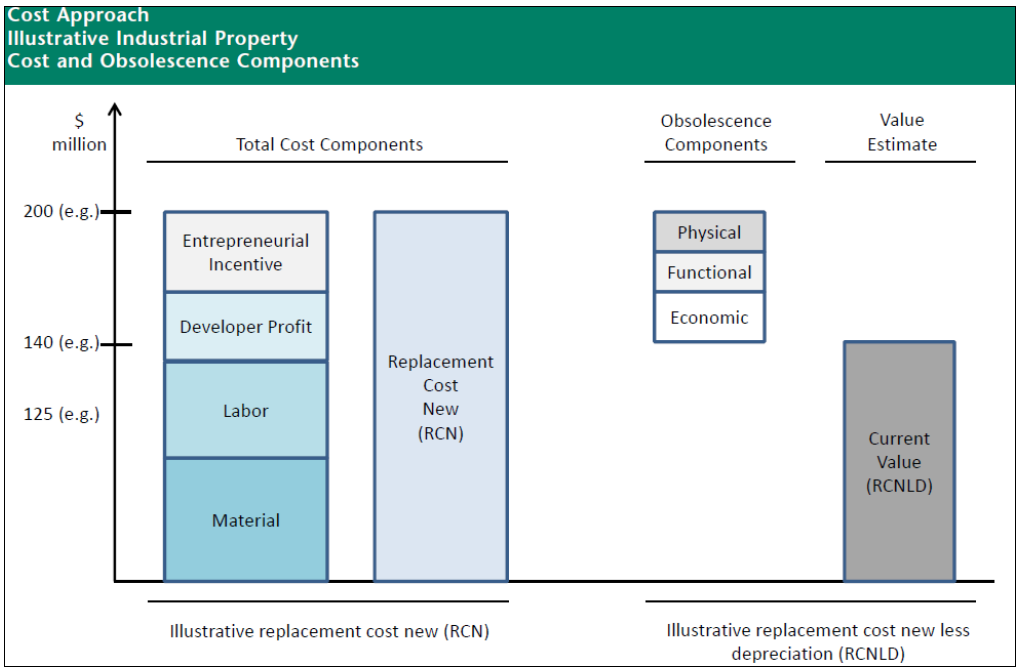

Fig 1: Illustrative approach to assessing obsolescence through cost method of valuation (Reilly, 2012) [43]

In the same vein, Gyamfi-Yeboah & Ayitey (2009) [21] solicited for proper estimation of depreciation for valuation purposes within the cost approach to value estimate. The study sees depreciation which includes obsolescence of crucial importance not only in arriving at correct estimate of value but also as it has the potential to reduce the variation that usually exist between values declared by valuers on the same property. The study identified the three causes of depreciation of interest to appraisers to include age, level of maintenance and functional obsolescence. The approach that the paper supports is one that explicitly incorporates all these elements in the process of estimating depreciation which prompted the development of what the study called "Decompositional Model". Such an approach, the study opined, provides perhaps the valuer's best estimate of accumulated depreciation for any particular property. The authors however, suggest that a further study and discussion be carried out to explore the possibility of developing or adopting a single model that will allow for a more objective estimation of functional obsolescence and age.

Consequent to the aforementioned review, this study has deduced that there is a relationship between obsolescence and depreciation; even though not all depreciation equals obsolescence, in treating depreciation in building, obsolescence cannot but be one key factor. Also, both hedonic pricing modeling (Clapp & Salavei, 2010) [15] and cost method of valuation (Gyamfi-Yeboah & Ayitey, 2009; Mansfield & Pinder, 2009; Reilly, 2012) [21, 29, 43] could be used to analyse the effects of obsolescence on residential property values. Furthermore, economic, functional and physical types of obsolescence are mostly reported in the literature to be having economic effect on residential property values. Though in general, obsolescence was found to be of negative effect on property values, however, the exception was revealed in social obsolescence which comes in form of planning control and government policy; it was evident that social obsolescence could be beneficial. Example is the introduction of new road which seems to severe residential lands, the existing property values might be boosted. The summary of this study also showed that a good reflection or treatment of obsolescence in valuation process could as well be beneficial to the land owner and financial institution (in the case of granting mortgage facility) which means that an omission of it in valuation might spell doom for the entire process. Finally, the review revealed that obsolescence could be managed or/and treated; hence, the need for a concerted effort by property owners, professionals and policy makers for its efficient management in order to ameliorate its lethal effect on property values.

5. Conclusion

This review has shown that though there is a correlation between obsolescence and residential property values, though the relationship seems indirect. Most of the studies did not evaluate directly the impact of obsolescence on residential property value; rather, the symptoms or causes of economic obsolescence were studied. These include: pollution, landfill, aircraft noise, sewage plant, industrial plants, highway traffic, obstruction of views and the likes. Another important observation from this review is that most of the causes of obsolescence that may impact on residential property values fall under curable obsolescence. For instance, a meaningful Environmental Impact Assessment (EIA) report has been suggested in situations where industrial plants are sensed to be capable of causing

pollution of different types and magnitudes. Also, in a situation whereby the siting of an airport is envisaged of causing noise pollution which could have negative effect on the housing values within the environment, payment of adequate compensation has been suggested. Efficient management and maintenance of the residential buildings by the property manager has also been found to be an effective remedy or cure for physical obsolescence. This, if properly carried out is capable of prolonging both the physical and economic lives of the building. In the case of functional obsolescence, feasible and flexible design which must be seen to be properly implemented and monitored has also been recommended as a cure to obsolescence.

Obsolescence, especially physical, functional and economic, has been confirmed through this review of capable of influencing residential property values and that it is of paramount importance for valuers to pay special attention more importantly while applying cost method of valuation in order to guard and guide against over or under estimation as the case may be. Essentially, one basic limitation of this study is its inability to expatiate on the treatment of obsolescence in valuation process. This is however treated as an opportunity for future research. Also, this study observed a dearth of relevant studies on the influence of obsolescence on property values. Hence, professionals especially in real estate are implored to rise up to this challenge. This, if addressed, is expected to further reveal the danger inherent in mismanagement of obsolescence in properties especially with reference to property values.

In conclusion, obsolescence when not properly managed is capable of having negative influence on the value of houses. Hence, valuers are enjoined to take into account the impact of obsolescence while carrying out valuation exercise either for sale, purchase, investment, mortgage, rating and taxation, probate or any other purpose. This is expected to guard against problem that may arise after valuation process which usually results into prolonged litigation. This study also among other reasons is expected to serve as clarion call on realtor to pay more attention to research on the relationship between obsolescence and residential property valuers with a view to boosting real estate profession.

6. References

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