



# Standardization of Plant and Equipment in a Developing Country; Techno-Economic Considerations

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## ABSTRACT

Standardization is critical in the promotion of “uniformity, consistency, reliability, public trust and international acceptability in valuation reports. Globalization has linked the world economy more closely than ever before as financial crisis in one country may likely have a ripple effect on other countries. In this regard each country must align its valuation standards with global expectations particularly in the valuation of plant and equipment. This paper is aimed at evaluating the extent of compliance to valuation process amongst Nigerian Estate Valuers with respect to plant and equipment valuation with a view to enhancing uniformity and reliability. A content analysis of valuation reports from randomly selected 26 firms in Lagos was carried out. The reports were evaluated to verify if they are in sync with acceptable valuation process and standards. Findings from the study showed that most of the reports are scanty in content with respect to machine capacity, serial and model number, make of machine, type of defect, basis and method of valuation among others. The paper recommended a more intensive training of valuers and an urgent need for specialization and production of a comprehensive valuation standard and manual to address these shortcomings.

Keywords: Equipment, Guidelines, Manual, Plant, Standardization, Valuation

## 1.0 Introduction

Plant and machinery valuation is a generic specialization within the valuation discipline, just as we have specialization in Medicine, Law and Engineering among others. As a

specialization, valuation of plant and machinery existed within the general valuation principles, practice and methodology. Like any other assets, the value of plant and machinery revolves on the characteristics or attributes of

individual plant and machinery on the one hand, and the totality of the valuation environment within which it is engaged- the interacting variable forces of technical/physical (volume, capacity, model, speed, machine attributes productivity/output), economic (production efficiency, utility, marketability), legal (ownership structure, limiting condition), institutional and the production system in which the plant and machinery is engaged (Ifediora 2009, Otegbulu and Babawale 2011).

Although valuation of plant and machinery has existed within the general appraisal practice since about the 16<sup>th</sup> century, it has not received appropriate attention in appraisal as real estate in spite of its pervasive influence on the economy and the standard of living of the people.

However, the increased volume of plant and machinery due to industrialization, rapid economic changes, quickening pace of globalization of investments and unprecedented advances and development in new technology have greatly improved the place of plant and machinery as object of valuation for almost all purposes. The valuation profession is likely to face a period of significant change in coming years, in terms of how the valuation process is managed, the role of the valuer as well as the added value to clients (RICS, 2017).

Today various valuation bodies have specialties or faculties in plant and machinery. Thus the Royal Institution of Chartered Surveyors (RICS) has created within its professional practices, specialization or faculties of plant and machinery. Also the American Society of Appraisers (ASA) has machinery and Technical Specialties (MTS) as part of

her professional examination syllabus (ASA 2000) cited in (Otegbulu and Babawale, 2011). The Nigerian Institution of Estate Surveyors and Valuers also has created a faculty of plant and machinery.

The growing need for plant and equipment valuation calls for its standardization in line with global best practices. It has become a constant feature in companies annual financial reporting and reported under the non-current asset section by accountants relying on valuation reports from professional Estate Valuers. In addition to this, the valuation of plant and machinery is also required for other purposes like secured lending, insurance, taxation, merger and takeover bid etc. The application of 2005 international financial reporting standards (IFRS) has a subsequent impact on the financial sector as a whole. The accountants have to choose between the historical cost and market value approach in the determination of the value of clients' assets (Nasir 2013). In Nigeria, as in most other countries, the implementation of IFRS has an overwhelming effect on the financial system especially for plant and machinery valuation for financial reporting.

Section 16 of IAS recognized the role of valuers in the valuation of asset and the IVS provides guidelines for their valuation (plant and machinery inclusive). All these are meant to standardize valuation reporting in line with international best practices. However, the major challenge is that most valuers are not aware of these standards and when they are aware are not familiar with its provisions. In addition to this, most countries have not been able to domesticate these standards

for local consumption. In Nigeria, domestication of the IVS has been on piece meal basis, until recently when an extensive Nigerian valuation standard is being developed by the Estate Surveyors and Valuers Board of Nigeria. The lack of enforceable valuation standards specific to Nigerian property markets has resulted in subjective practices in valuation. The worst affected is plant and machinery valuation due to a deep technical and economic knowledge required in compliance with international best practices. Unavailability of information data bases have contributed to wide variability in the performance of local valuers. According to Isaac and Steley (2000), valuation is regarded as a matter of opinion subjective to an individual's assessment of different factors. To address this, valuation standards at national and international levels will play important roles in the promotion of ethics, integrity and impartiality amongst valuers (Hemphill, Lim, Adair, Crosby and Mcgreal 2014) cited in (Narayan, Biwas and Sahib 2017). For the avoidance of doubt, standardization will help in minimizing bias, and bring uniformity in asset valuation in line with global best practices. According to Pearce (2007), valuation standards should address four key requirements:

- Set out the principles of governing the guidelines and the approach to valuation. For instance, the standard should lay out the correct treatment of valuation within the company's balance sheet
- Cover ethical considerations – that is they should define the best practice, dealing with such matters as conflict of interest in terms of engagements

- Cover technical considerations, including for instance, points on the valuation of plant and machinery and the calculation of provisions for depreciations
- Ensure that the mechanism for proposing, formulating and modifying standards are responsive to pressures and requirements.

Standardization is a global trend and nations must respond to it with respect to valuation practice if they must remain relevant and connected to the global market and economy. Globalization has linked the world's economies more closely than ever before as the financial crisis in Thailand dragged down stock exchange in South-Korea, Malaysia and Indonesia, contributed to the Russian government defaulting on roble-backed bonds and almost halted the longest period of growth in American history (Berger, Nast and Rauback 2002). In recent times there have been complaints from valuation clients like the banks, security and exchange commission, Asset Management Company of Nigeria (AMCON) on the inconsistency and unreliability of valuation reports. These inconsistencies will no doubt lead to valuation errors of variance and inaccuracy. This calls for the need for the entire property industry to speak with one voice. This study is therefore aimed at evaluating the extent of compliance to valuation process with respect to plant and equipment valuation with a view to enhancing uniformity and reliability.

The valuation process is a systematic procedure used by appraisers (valuers) to provide answers to clients question about value and value related issues. It begins when the appraiser understands and identifies the appraisal problem at hand and concludes when the appraisal report provides or reports the solution to the client. The number and manner of steps taken to resolve the problem depends on the nature of the valuation engagement and data availability. The goal of the valuation process is to produce a well supported value opinion which shows that the valuer has considered all material factors that affect the value of the asset being appraised (American Society of Appraisal (ASA, 2011; Ekeocha, 2012) Studies such as Gambo (2014) evaluated the response of Nigerian Valuers to international valuation standards application; how far the journey? Babawale (2012); An Assessment of the current standard of real estate valuation practice in Nigeria; Dugeri, Gambo, and Ajayi (2012); Internalising International Valuation Standards: Relevance and Applicability issues in the Nigeria Context had looked at different issues on valuation standards, not in relation to plant and machinery but land and buildings. Therefore, this paper will be the first study on valuation standards for plant and equipment in Nigeria.

## **2.0 Review of Related Literature**

### **2.1 Importance of Valuation Standard**

Valuation standard have a significant role to play in helping to regulate professional practice, at national, regional or global levels, promote professional ethics, integrity, impartiality and trust in valuation reports (RICS 2014). Absence of standards will introduce chaos and anarchy in valuation practice by making valuation subjective to individual valuers. Many professional bodies and government agencies are under pressure to regulate the valuation profession vide reviewing of regulatory environment, valuers training and compliance with standards. In some developing countries, many government agencies are yet to come to terms with the need for them to use the services of trained and regulated professional valuers. RICS (2014) further indicated that at the international level, the international valuation standards council (IVSC) have become the recognized body that produces the international valuation standards (IVS). The IVSC also encourages member countries to domesticate the IVS so as to reflect local peculiarities. In the study on valuation accuracy in Nigeria, Ogunba and Ajayi (1998) noted among others that there is a degree of inadequate understanding and wrong application on methods on the part of some valuers. Valuation standards could help in streamlining this.

### **2.2 Valuation Variance, Inaccuracy and Standards**

The problem of variation in value estimates among valuers lies at the very heart of the set of skills assembled by

the valuers as well as the valuers experience and judgement (Aluko 1998, Ajayi 1998, Baum and Crosby 1998). Valuers inconsistency in the application of valuation models is a potential source of valuation bias. IVS 2017 is very comprehensive and have introduced new dimensions to help the valuer to arrive at a reliable valuation opinion. There is a strong public interest in the integrity of the valuation process. Consistent and transparent standard in valuation are not only the responsibility of the valuation profession, but also that of the government and other stakeholders.

The public who use the valuation services expect valuers to meet fundamental standards and demonstrate independence (Gilbertson and Preston 2005). This is due to the central role of asset valuation in financial decisions. In most emerging markets and some matured markets, valuation practice has remained inconsistent and suffers lack of transparency. Inaccurate valuation is adverse to healthy development of the property and financial markets. In Nigeria, the standard of valuation practice needs much improvement if the valuation profession is desirous of remaining relevant in the market. The two major errors in valuation is that of inaccuracy and variance. Valuation accuracy deals with the discrepancy between previous independent valuation and the transaction price of the property precisely. Put, it is the ability of a valuation to correctly identify the target (Crosby, Matysiak 2002; Nasir 2006; Otegbulu, 2018), Valuation variance on

the other hand, refers to the difference between the valuation produced by different valuers working on the same asset at the same time. It is essentially a theoretical measure used to indicate the reliability of a valuation or the robustness and potential accuracy of the valuation (Bowles, McAllister and Tubert 2001)

Teasing from various sources, Hiironen, Niukanen, Laitala , Olrankammen (2014), identified the followings as factors contributing significantly to inaccuracy in valuation:

- The nature and state of the property market (Millington 1985, Bowles et.al 2001, Dunse et.al 2010)
- Quantity and quality of Data (Dunse et.al 2010, French and Gabrelle 2004)
- Definition of value (Millington 1985, Baum and Crosby 1988, p 5)
- The integrity of the valuer (Levy and Schuck 1999)
- Complexity of the property (Brethom and Wyatt 2002)
- Valuation methodology (Baum and Crosby 1988, p.20)
- Skill, experience, and judgement of the valuer (Gallimore 1998) and
- Clients influence (Levy and Schuck 1999, Amidu and Aluko 2007)

The need for accurate valuation is based on the fact that valuation is both a guide and a decision making tool. It provides the basis for asset performance measurement and related investment advice. In effect, a well-researched and

supported valuation could significantly contribute to the financial well-being of the client. Conversely, a shoddy inaccurate valuation could lead to incalculable financial loss to real estate investors (Renaud 2000 cited Addas-Dappach 2001)

It is important that investors and other parties who rely on the valuation of industrial asset (Plant and Machinery) be confident that the figures produced by plant and machinery valuers shadow the realistic value/price of the asset under consideration in line with the purpose of valuation. By sending wrong signals to the market participants, inaccurate valuation leads to sub-optimal decisions which results in incalculable financial loss to investors and financial institutions. Inaccurate valuation, therefore, jeopardize the future of the property industry (Milington, 1985, Brown, 1991 and Parker 1998, Otegbulu and Babawale 2011).

Valuation standard is essential as a result of growing concerns from auditors, bankers, financial analysts and company directors that a consistent basis of valuation is used to enable valid comparisons to be drawn for the valuation of fixed assets worldwide. The increasing demands from local and international companies, financial institutions and other stakeholders for current valuations, reflecting the importance of asset values in the issue of shares (share floatation), acquisitions, mergers takeovers and for secured lending have been part of the reasons

for the formation of IVS (Nasir 2013). Standards have always come up as a panacea for challenges in valuation practice. For instance, the RICS responded to the 1970 property crash in the United Kingdom (UK) by publishing the Red book, that set out standards of valuation and professional conduct expected of valuers, while the federal government in the United State of America (USA) responded to the “savings and Loans” crisis of the late 1980 by insisting on uniform appraisal standards and the licensing of valuers in each state which led to the state certification of all valuers along with adoption in each state of the revised uniform standard of professional practice.

Unfortunately, the lesson learnt from UK and USA were not applied elsewhere including Nigeria when similar problem occurred. To the valuation profession in Nigeria, it is an opportunity for more valuation jobs without providing standards that will give confidence to the valuation process.

### **3.0 Valuation Practice and Standards**

There are various standards in use by Nigeria Valuers. They include; International Financial Standard (IFS) and International Accounting Standards (IAS), RICS Red book, Estate Surveyor and Valuers Registration Board valuation template.

The recent edition of the International valuation Standard IVS (2017) made comprehensive provisions for the valuation of assets of all categories

including plant and equipment. Valuing plant and equipment is different from other types of assets such as real estate and intangibles because the value may be different depending on the premises of particular valuation, liquidation (partial and full) value, orderly liquidation or forced liquidation, going concern, financial reporting, secured lending etc. The valuer has to look at the appropriate standards and guidelines for the particular purpose and premises of valuation. Sec 20.5 of the IVS 2017 states that the valuation of plant and equipment will formally require consideration of a range of factors relating to the asset itself, its environment and physical, functional and economic potential. Examples of such are factors relating to the asset; covering, technical specifications, useful economic life, asset condition and maintenance history, depreciation, premises of value and current location, limited tenure, installation costs etc. Environment related which covers; location in relation to raw material, (including nature of demand e.g. transitory and infinite) impact of environment and legislation that may restrict utilization or imposes additional decommissioning or operating costs, licenses to operate certain machines in some countries may be restricted. Economic related covering the actual or potential profitability of the asset based on comparison of operating costs with earnings, the demand for the product manufactured, the potential of the asset to be put into more valuable use. The provisions of IVS 2017 are very similar

to that of 2011 with regards to the valuation of plant and equipment.

In spite of the provisions of the IVS and other local standards most valuers in Nigeria rarely comply with the provisions in their valuation. Few of the practitioners will indicate in the opening ambit of their report that reliance is made to the provisions of IVS, the redbook, Nigeria Institution of Estate Surveyors (NIESV) guidance notes and Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) Valuation template. The only compliance to the mentioned standards in the report is definition of market value. There are no technical details like capacity, model Number, Serial Number, Country of manufacture, existence of special foundation or not, cabling and piping, installation and transportation costs. They rarely relate their valuation process to IFS or IVS or any other standard. The critical area of value measurement with regard to IFS 13 and IAS 16 are ignored. Very few indicated their purpose and basis of valuation. In some cases purpose and basis of valuation are treated as the same. There is no uniformity in the manner or format of valuation reporting. Under the section for condition, the machine is just described as good, fair or poor without any remark on the nature of the defect. There are issues that need to be addressed by the forthcoming ESVARBON Green Book. The green book (valuation standards of Nigeria- forthcomin) should also address the issue of scrap and salvage value in the valuation of plant and

equipment. The provision of Economic and functional obsolescence which is often ignored by valuers in Nigeria should be addressed.

#### 4.0 Methodology

In order to ascertain fully the valuation pattern of Nigeria valuers in the valuation of plant and equipment, a content analysis of 26 (twenty six) valuation reports on plant and equipment from 26 valuation firms in Lagos Nigeria was carried out. The reports were randomly collected from as many valuers that are ready to respond to the request.

This paper evaluated the level of compliance to international best practices by practicing Estate Valuers in Lagos in the valuation of plant and equipment. This is based on twenty-four items which are of importance in

achieving accuracy in plant and equipment valuation, an improper inventory and data collection is fundamental source of error in asset valuation. Some of these items include:

- Purpose, basis and method of valuation
- Micro and macro identification – This deals with machine details like model number, serial number, capacity of plant and machines among others. The paper also reviewed issues like provision of depreciation – physical deterioration, functional obsolescence and economic obsolescence. Lastly, the study examined the application of valuation standards by valuers. These are very critical to the reliability and accuracy of a valuation report.

#### 5.0 Data Presentation

Table 1: Check List for Valuation Report on Plant and Equipment

Valuation Consideration	No of Compliant Firms	Percentage	No of non-Compliant Firm	Percentage
Purpose of Valuation	6	23.00	20	77.00
Basis of Valuation	8	30.76	18	69.23
Method of Valuation	6	23.00	20	77.00
Description of production process	1	3.84	25	96.16
Physical deterioration	5	19.23	20	80.77
Economic obsolescence	-	0.00	26	100.00
Functional obsolescence	-	0.00	26	100.00
Machine Capacity	3	11.54	23	88.46
Cabbling	-	0.00	26	100.00
Piping	-	0.00	26	100.00
Special Foundation	-	0.00	26	100.00
Installation and incidental expenses	2	7.69	24	92.31
Maintenance History	-	0.00	26	100.00
Make of Machine	10	38.46	16	61.54
Year of purchase or Installation	7	26.92	19	73.08
Model	8	30.76	18	69.23
Serial Number	6	23.00	20	77.00



Extras	1	3.84	25	96.16
Application of Valuation Standards:				
IVS	4			
RICS Red book	2			
Local Standard	3	34.62	17	65.38
Condition	26	100.00	0	0.00
Nature of Defect	0	0.00	26	100.00

Result from table 1 shows that a high level of non-compliance to Valuation Standard with regards to plant and equipment Valuation.

The level of inconsistency in valuation reporting needs much to be desired. Any investor with a good understanding of valuation reporting will scarcely rely on such valuation reports. They lack most of the attributes that will lead to accurate determination of value. In addition the reports convey little or no information on the plant being valued. Without indicating the capacity and model of a machine, how do you determine the cost new of similar machines. The same applies to the make and country of manufacture. Cabling and piping could be very expensive and from the content analysis they were ignored by most valuers. None of the valuation report examined provided for functional and economic obsolescence. Due to poor understanding of the subject of plant and equipment valuation some valuers ignore inclusion of special foundation which in some cases could be as deep as 6-10 meters of reinforced concrete. Finally only 23% of the reports analyzed indicated the method of valuation used. This is a very serious omission. The valuer must indicate the method of valuation used and demonstrates what level of value measurement he has applied in his valuation.

Model and serial numbers are important for proper identification and valuation of machines. The model number has an

effect on the value of the machines. Installation costs could be very expensive and only 7.69% of the reported works included it. The installation cost should be depreciated also.

### 6.0 Findings

- There's evidence that most of the valuers engaged in machinery/equipment valuation lack the necessary skill and expertise.
- There is wide inconsistency in valuation reporting showing lack of understanding of the valuation process with respect to plant and equipment measurement.
- There is a general lack of adherence to standards. Findings from the reports showed that there are as many standards as individual valuers carrying out valuation.
- Plant and machinery is practiced as an all corners affair due to absence of specialization.

### 7.0 Recommendation

- There is need for special training and certification for those practicing plant and equipment valuation
- An enforceable valuation manual and standards will be useful in sensitizing the practice as this will enhance consistency, uniformity and reliability of valuation reports.
- Specialisation should be encouraged in the area of plant and equipment

valuation as this will ensure that only those with the proper learning and skills are admitted to practice plant and equipment valuation.

- Regular courses in this area of specialization should be introduced by way for continuing professional development

### 8.0 Conclusion

In the light of the above, there is need for more training for valuers both in practice and tertiary institution to improve their skill in plant and equipment valuation. Information skill and knowledge is key to valuation accuracy. To minimize inaccuracy, the valuers must adhere to a uniform standard taking into consideration the utility of the asset, and its contribution to the production and services for which it is designed and developed. He should have sufficient knowledge on production process, plant layout and balances in different sections as conditioned by micro economic forces.

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There is a strong public interest in the integrity of the valuation process, as the public who uses the valuation services expects that valuers should adhere to fundamental standards and demonstrate independence of mind, integrity and objectivity. The training and experience of a valuer are important for the valuer to carry out good and reliable inventory in plant and equipment valuation. Derry (1991) asserts that ensuring that exact content of appraisal is right if properly inventoried is not always given deserved attention and that error in establishing the schedule of assets at this stage can lead to greater inaccuracies than later mistakes in the valuation process. The valuation fraternity must speak with one voice by adhering to the same valuation standards if valuers want to remain relevant. Findings from the content analysis are clear indications that there is urgent need for retraining of valuers, specialization and enforcement of standards.

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