

AN EVALUATION OF THE APPLICATION OF COMPUTER ASSISTED MASS APPRAISAL IN TANZANIA

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Abstract

Property tax is an invaluable source of revenue that is harnessed to finance municipal services in many urban areas all over the world. In most tax jurisdictions, property tax is a levy that is based on the market value of the property, hence often there is a need to carry out regular property valuations with a view to updating the tax base of a rateable area. In Tanzania, rating valuation has traditionally been carried out using the single parcel valuation approach. This approach, unfortunately, is often beset with a number of problems: it is costly, labour intensive, time consuming, tedious, opaque and can potentially induce valuation inconsistencies.

Worldwide trend has been to move away from the traditional single parcel based valuation approach and gravitate towards the adoption of Computer Assisted Mass Appraisal (CAMA) that is integrated with Geographic Information Systems (GIS) capabilities to achieve better results. The latter approach is credited with being a more efficient property valuation approach compared to the traditional single parcel based valuation model. GIS-CAMA is renowned for being less costly to implement, especially in the long-run; requires less professional manpower as the valuation function can be detached from the data capture function; is less time consuming, more transparent and leads to greater consistency in values – which is critical in *ad-valorem* tax systems.

In cognisance of the immense GIS-CAMA potential, GIS-CAMA was applied for the first time in Tanzania in a pilot rating valuation project in the Mtwara-Mikindani Municipality from the year 2012 whereby to-date a total of 16,000 rateable properties have been valued. This paper examines the robustness of the Mtwara-Mikindani rating valuation project with a view to determining whether or not it is worth being replicated in other urban authorities in the country.

It is found that the Mtwara-Mikindani rating valuation project has, in general, been successful particularly in terms of dealing with most of the typical problems that are ingrained in the single parcel valuation approach. Nonetheless, the adoption of CAMA in the municipality has not been without problems. Amongst the main criticisms of the application of CAMA in Mtwara-Mikindani, is that the valuation model is a quasi-sophisticated model that can potentially lead to valuation variance; the level of subjectivity that is inherent in the model makes the CAMA model a near replication of the single parcel based valuation approach, absence of standards on CAMA rating valuation and lack of legal backing for the adoption and application of CAMA in Tanzania.

Despite the observed drawbacks of the pilot CAMA project in the country, there are early indications that CAMA holds promise in relation to improving the efficacy of rating valuations in the Tanzania. This is particularly so if the early teething problems of CAMA application that are outlined in this paper are addressed.

Keywords: Property rates, rating valuation, Computer Assisted Mass Appraisal, Mtwara-Mikindani.

1.0 INTRODUCTION

1.1 About Mtwara Region and Mtwara-Mikindani

Mtwara region is one of 26 regions of Tanzania Mainland. It is the southernmost region of the country lying between longitudes 38° and 40 ° 30" East of Greenwich. It is also situated between latitudes 10 ° 05" and 11 ° 25" South of the equator. It borders Lindi region to the North, the Indian Ocean to the East and separated from Mozambique by the Ruvuma river in the South. To the West it borders Ruvuma region.

Mtwara region occupies 16,720 square kilometres or 1.9% of the Tanzania Mainland total land area of 885,987 square kilometres. It is the second smallest region in the country after Kilimanjaro region. Mtwara region is administratively subdivided into 5 districts, 21 divisions, 98 wards and 554 villages. The five districts with their relative percentages of the total regional land area include Masasi (53%), Mtwara rural (22%), Newala (13%), Tandahimba (11%) and Mtwara-Mikindani (1%). The smallest of the districts is the Mtwara-Mikindani district covering 163 square kilometres and the largest is Masasi district measuring 8,940 square kilometres. Map 2.1 below shows the location of the Mtwara-Mikindani Municipality.

The Mtwara-Mikindani municipality comprises of the twin towns of Mtwara and the historical coastal fishing town of Mikindani. Mtwara-Mikindani comprises 13 wards and 6 villages with a total population of 226,248 (National Bureau of Statistics, 2012). The Municipal Council has a total of more than 16,000 properties (GIZ, 2013). The economy of Mtwara region depends principally on trade, small-scale business and agriculture. The main cash crop is cashew nuts which are mainly processed for export. The recent discovery of large reserves of natural gas at Mnazi Bay in Mtwara region where commercial production began in 2006 has given the economy of Mtwara region a major boost. (National Natural Gas and Oil Policy, 2013). With the steady increase in economic growth,

business and infrastructure, the Municipal Council's financial needs to provide appropriate services grow too (GTZ, 2010). Therefore, Mtwara-Mikindani has an interest in strengthening its own revenue sources, including property tax.

Figure 2.1: Map of Mtwara-Mikindani



Source: Google Maps

1.2: Genesis and Regulatory Framework

The Government of the United Republic of Tanzania, through the office of Prime Minister's Office – Regional and Local Government (PMO-RALG) with assistance from GiZ Support to Local Governance Processes (GiZ-SULGO) established a Property Rates Reform Task Force (PRRTF) (GTZ, 2010). The aim of the reform is to oversee property rates reform in the country and ensure property rates reform undertaken by local authorities is successful. PRRTF also aims at ensuring property rates reforms are aligned with national strategic objectives, based on international best practice and replicated throughout Tanzania on a consistent basis.

To continue supporting the PMO-RALG in the implementation of the property rates reforms in Tanzania, GiZ-SULGO in close cooperation with the Mtwara-Mikindani Municipal Council set out to implement systematic and comprehensive property rates reform through fiscal cadastre construction and property rates administration manuals. The system is being developed by the PRRTF with a view to developing integrated computer application software.

This is to support the property rates administration management system linked to Tanzania Revenue Authority (ITAX) and the implementation of standardized administration procedures. It envisioned that key Standard Operating Procedures (SOP) for property rates administration will be developed. These Standard Operating Procedures will cover property information management, valuation/assessment, collection and enforcement and taxpayer education/service.

The Mtwara-Mikindani Municipal Council is also, through the office of PMO-RALG receiving support from the Tanzania Strategic Cities Project, which is a World Bank funded project. The prime aim of the Strategic Cities Project (SCP) is to improve the quality of and access to basic urban services in 8 participating Local Government Authorities (LGAs) including Mbeya, Mwanza, Arusha, Dodoma Capital Development Authority (CDA), Dodoma Municipal Council, Kigoma, Ujiji and Mtwara. The SCP has three components: (i) core urban infrastructure and services that is geared towards improving core infrastructure and key urban services; (ii) institutional strengthening including improved own source revenues and (iii) implementation support and preparation of future urban projects. The first component comprises two subcomponents that are intended to provide: (a) investment in core urban infrastructure and services and (b) technical assistance for construction supervision and support for the implementation and monitoring of Environmental and Social Management Plans (ESMPs) and Resettlement Action Plans (RAPs) including the payment of compensation.

The pilot CAMA based rating valuation project in Mtwara-Mikindani was implemented by a team of experts holding diverse backgrounds and experience. The team comprised international and local experts. The international experts who were engaged in the project had handled similar projects in several countries including the Philippines, Malaysia, Indonesia and South Africa. The team included a public finance expert in local government from Public

Finance Group at the Duke for International Development of USA, a CAMA rating expert from the USA, Property Tax Reform expert, Urban Land Analysis and International Development expert, and GTZ/GIZ Project Sponsors. The team of local experts included valuers from Property Market Consult Ltd and Information Technology from the University of Dar es Salaam Computing Centre (UCC).

1.3 Research Methodology

The findings of this study are based on the author's personal visit to the project area of Mtwara-Mikindani in 2012. Participant observation was conducted by examining the valuation project as it was progressing and accordingly, the nature of the properties valued, and technical aspects of valuation and operation of the CAMA system were observed from first hand. Face-to-face interviews were held with the Managing Director for Property Market Consult Ltd., the firm carrying out valuation of properties in the Mtwara-Mikindani municipality. Similar interviews were held with Mtwara-Mikindani technical staff including the Mtwara-Mikindani Municipal Valuer and ICT experts.

2.0 LEGAL FRAMEWORK AND PROCEDURES FOR RATING VALUATION IN TANZANIA

The history of property tax in Tanzania is traceable to 1946 when the colonial government enacted the Municipalities Ordinance (Cap 105) that authorised municipalities to levy a ten percent tax on the capital value of all buildings. In 1952, the Local Government (Rating) Ordinance Cap 317 was enacted. The Ordinance expanded the tax base to include the unimproved site value for all properties held under long-term leases.

In 1972, local governments were abolished following a “decentralisation” move. The abolition of local governments meant all taxes on property were also eliminated. By 1974, however, due to financial constraints, the government was forced to enact the Land Rent and Service Charges Act which introduced a system of centrally controlled “Land Rent and Service

Charge” levied on land held under either a short or long-term Right of Occupancy.

By 1978, the government recognised the scale of problems associated with the abolition of local governments that manifested itself in a crisis of rapidly deteriorating urban services and infrastructure. Hence, local governments were re-established in 1978 (Kayuza, 2006) and became fully operational with the enactment of a number of pieces of legislation, the most notable being the Local Government Finances Act, No. 9, (1982) and the Urban Authorities (Rating) Act No. 2 of 1983.

Today, property tax is levied in Tanzania under the provisions of the Government Finances Act of 1982 which spells out sources of revenue for local governments, property tax being one of them. Matters of detail on the property rating are captured in a separate piece of legislation, the Urban Authorities (Rating) Act that was enacted a year later, in 1983.

A rating exercise commences with the declaration of a rateable area by the Minister responsible for Local Government. The declaration of a rateable area is made following consultations with the relevant rating authority and the publishing of a notice in the government gazette. The declaration is followed by the appointment of a “Valuation Surveyor” who is responsible for overseeing the physical inspection/survey of properties, estimation of property values and the preparation of a valuation roll.

Two types of rates are permitted under the Act: a “general rate” is levied and paid by every owner of a rateable property in an urban area and a “special rate” may be levied where the Minister assents to the undertaking of a special scheme that would benefit a particular area within an urban area. A similar system is found in some other countries as well. In Johannesburg, taxpayers living in areas that have been designated by the Council as 'special rating areas' may be liable to paying a special rate on top of the ordinary rate (City of Johannesburg, 2012).

According to the Urban Authorities Rating Act, the rateable value of a property is based on the market value of the property or where the market value of the property cannot be ascertained, the Depreciated Replacement Cost (DRC) of the property forms the rateable value of the property. The Act is strict on depreciation allowances. The maximum permissible depreciation deduction is 25% of the Replacement Cost. All rating valuations undertaken in Tanzania to-date have been based on the DRC approach on account of the dearth of data on market transactions, but perhaps also for the sake of achieving valuation consistency.

“Rateable property” includes all properties within the jurisdiction of an authority which are in actual occupation and of sufficiently permanent nature and all improvements that are annexed to such hereditaments. Only rateable plant and machinery can be valued for rating purposes. Rateable plant and machinery is machinery which is so attached to a building that it forms an integral part of the building or structure, which seems to be in conformity with the Latin maxim *'quicquid plantatur solo, solo cedit'* i.e. whatever is affixed to the land becomes part of the land (James, 1971). Any other plant and machinery such as 'process' plant and machinery is not rateable in Tanzania.

The “owner” of a property is any person holding the premises under a Right of Occupancy and where the owner of such premises cannot be found, the person in actual occupation of the premises is deemed to be the owner of the property.

The 'rate in the pound' to be paid by taxpayers is a proportion of a property's rateable value. It is computed by reference to the amount of revenue that a local authority wants to raise relative to the total rateable value of an urban authority appearing in the valuation roll. In Bedford Borough Council and other Borough Councils of UK the non-domestic rates charge for a property is calculated by multiplying the rateable value of the property by the 'rate in the pound'

for that financial year. (Bedford Borough Council, 2015). The rate in the pound is also known as the 'poundage' or 'multiplier'. In Dar es Salaam, property rates have remained the same over many years and they range between 0.15% to 0.2% of the rateable value of a property (Kayuza, 2014).

Certain properties have been specifically exempted from the payment of rates by the Act. Exempted properties include property in the personal occupation of the President, property used wholly for the operational purposes of public utility bodies, property used primarily for public worship, public libraries and museums, cemeteries and crematoria, railway infrastructure and any other property that may be prescribed by an urban authority. Amendments to the list of exempted properties were made in 1997, and amongst additional exempted properties include property used by a local authority and property used exclusively by an educational institution (Kelly and Masunu, 2000).

Once the valuation roll has been prepared, the rating authority publishes the roll for the general public to inspect. In case there are objections to the contents of the valuation roll, these are referred to a Rating Valuation Tribunal that determines all objections before the collection of rates can legally commence. The decision of the Rating Valuation Tribunal is final but disagreements on points of law can be referred to the High Court. Once the objections have been determined, property owners are notified of the amount of rates that they should pay. The Rating Act provides for a centralised Appeals Tribunal that can only be appointed by the Minister responsible for Local Government.

Supplementary valuation rolls are prepared to capture new properties and changes in properties that were not recorded in the main valuation roll. The preparation of supplementary valuation rolls is, therefore, a continuous process. Based on section 83 of the Urban Authorities (Rating) Act, 1983, urban authorities are

mandated to prepare a fresh valuation roll on a quinquennial basis or at least once in every five years.

As stated above, the administration of property tax in Tanzania is vested in LGAs including property rate assessment, billing, collection and property tax enforcement (Local Government (Finances) Act, 1982 and Urban Authorities (Rating) Act, 1983). In 2008, however, property tax collection for Dar Es Salaam municipalities was transferred to Tanzania Revenue Authority (TRA) up to 2013 when the responsibility reverted to local government. The TRA property tax collection record was generally poorer than that of local authorities (Kayuza, 2006).

3.0 THE PILOT CAMA PROJECT IN MTWARA-MIKINDANI

3.1 CAMA Model Generation

Before generation of the CAMA model, preparations were made by the GiZ and Mtwara-Mikindani team of experts. The first exercise entailed the digitisation of hard copies of up-to-date maps by Municipal Surveyors. The GIS component was configured to use the standard ARC-GIS software. Currently the maps have only two layers: (a) the land blocks and land parcel layer and (b) the road/street network layer. Most of the streets remain unnamed and street naming is one of the stumbling blocks for the full realisation of the GIS-CAMA model. The GIS database has been populated with property photographs and building footprints.

The preparation of electronic maps was coupled with the development of a CAMA model. The software used is bespoke software prepared by the University of Dar Es Salaam Computing Centre (GTZ, 2010 and Mtwara-Mikindani Municipal Council). Currently CAMA uses the Property Rate Information Management System (PRIMS). The current version is dubbed iPRIMS Version 2.0.0.0. Various queries can be raised and reports generated by the integrated GIS-CAMA software. The software can deal with data capture, valuation and tax administration issues i.e.

billing and collection including showing delinquent taxpayers and penalties that are due to the delinquent taxpayers. Of late, iPRIMS has been integrated into the Tanzania Revenue Authority (TRA) integrated revenue management system - iTAX which has been specifically developed for Local Government Authorities with GIZ support (GIZ, 2013). The software has been developed over a period of two years from 2011 to 2013. The TRA uses iTAX in the collection of income tax, corporate tax and Value Added Tax. For Local Government Authorities, iTAX has been designed to handle all types of local taxes (not just property tax) and fees that local authorities collect (GIZ, 2013).

Rating valuation is statutory valuation as provisions on how rating valuation should be conducted such as what constitutes rateable property, permitted methods of valuation, how to handle depreciation assessments and so on are contained in the Urban Authorities (Rating) Act, 1983. Before dwelling on how the CAMA model was generated, it is important to review key provisions of the rating Act on how valuations should be conducted. Below we reproduce relevant sections of The Urban Authorities (Rating) Act on the basis of rating valuation in Tanzania. Sections 21 and 22 are particularly instructive on this matter and, accordingly, they have been reproduced ad-verbatim below.

21			Subject to this Act, the premises rateable under this Act are all premises comprising buildings or structures or similar development.
22	(1)		Subject to subsection (3) of this section, for the purposes of this section the rateable value of premises shall be the market value of premises or where the market value cannot be ascertained the replacement cost of the buildings, structures and other developments comprised in the premises after deducting the amount which it would cost at the time of valuation to restore the premises to a condition in which they would be as serviceable as they were when new;
			Provided that the rateable value shall not be less than 75 per cent of the replacement cost.
	(2)		In this section-
		(a)	the expression “replacement cost” means, in relation to buildings, structures, and other development, the amount which it would cost, at the time when the premises are being valued to provide all the buildings, structures and other development as they were when new if the premises consisted of an undeveloped site;
		(b)	the expression “development” means any kind of work or improvements carried out on or in land and includes in particular foundations, excavations, drainage systems, and pathways, aprons and other prepared surfaces; and
		(c)	references to buildings and structures include references to machinery which is attached to and forms an integral part of any building or structure.
	(3)		The Minister may by an order in the Gazette either generally or in respect of any particular authority prescribe a basis for the assessment of rateable value of premises other than that prescribed by this section and where any order is in force in respect of any authority this section shall not apply to that authority.

Since rating valuation is statutory valuation, the rating valuation in Mtwara-Mikindani had to develop a valuation model that aligns itself with the national rating law. The rating model that was specified for the purpose of valuing rateable properties in the

Mtwara-Mikindani municipality took the following form:

$$PR = BA * BR * QM * (1 - D) * LAF \dots (\text{Eq. 3.1}).$$

Where:

- PR = Property Rate
- BA = Building Area
- BR = Base Rate per Square Metre
- QM = Quality Multiplier
- D = Depreciation
- LAF = Location Adjustment Factor

The Property Rate (PR) is a tax levy on a property. If a property has more than one building on the plot, the property rate for the property is the total of property rates for all individual buildings on the plot. The Building Area (BA) was calculated as the Gross External Area (G.E.A.) of the building, often involving taking measurements to the external extremities of a building. The total built up area for each building was measured and recorded as part of a property. Each property was assigned a unique Property Reference Number (PRN) and a metal plate was fixed on each building to show the identity of the building. Buildings belonging to the same property were assigned different building numbers but the same PRN for the property.

The Base Rate per square metre is a policy parameter that is determined by the Mtwara-Mikindani Municipal Council (Prime Minister's Office, 2015). It is the same as what is sometimes referred to as the "rate in the pound" in the United Kingdom. This is a property tax rate which an urban authority decides to levy on a rateable property. It is determined by taking the total amount of revenue that an urban authority would like to raise from property tax divided by the value of the tax base in the given tax jurisdiction. In the case of Mtwara-Mikindani, the tax rate that was adopted is 0.05 percent of the rateable value. The team of experts carrying out rating valuation in Mtwara-Mikindani had determined the construction rate for a standard or average quality building to be T.Shs. 250,000 (approximately US\$ 155) per square metre. Hence, the Base Rate or datum rate per square metre for a standard building that was adopted is T.Shs. 125 (i.e.

T.Shs. 250,000 x 0,05%) or US\$ 0.078 which is equivalent to 7.8 cents.

The Quality Multiplier (QM) is a factor that is used to promote or demote the per-unit cost of construction of a building relative to that of an identified standard or benchmark building. The benchmark building was assumed to be constructed of corrugated iron sheet roof, hard board or chipboard ceiling, concrete block walls and sand and cement screed floor finish. The typical Quality Multipliers that were adopted in the Mtwara-Mikindani rating valuation project are as shown in Table 3.1 below. The Quality Multiplier shows the relative value of a construction type relative to that of a benchmark building. In Table 3.1, the Quality Multiplier for the benchmark building for the different types of building materials has a value of 1.00. The Municipal Engineer was consulted by the valuation team to determine appropriate Quality Multipliers for different building components.

Table 3.1: Quality Multipliers

Wall Type	Multiplier	Roof Type	Multiplier	Ceiling Finish	Multiplier	Floor Finish	Multiplier
Concrete	1.60	Concrete	1.30	Concrete	0.94	Marble Granite	1.30
Glass	1.40	Metal Sheet	1.00	Gypsum	1.10	Stone	1.20
Metal	0.70	Cement Tiles	1.12	Timber	1.15	Terrazzo	1.10
Brick	1.00	Clay Tiles	1.15	H/board	1.00	Tiles	1.15
Timber	0.80	Asbestos	1.06	C/board	1.00	Timber	1.25
Mud	0.50	Timber	1.00	Other	1.00	Cement	1.00
Other	0.90	Grass /Palm	0.75	None	0.90	Other	1.00
None	0.62	Other	0.85			Earth/None	0.70
		None	0.68				

Source: Mtwara-Mikindani Municipal Council, 2012

For old buildings, deduction for depreciation had to be made so as to arrive at the appropriate Property

Rate for each property. As noted above, the Urban Authorities (Rating) Act, 1983 imposes a constraint on the amount of depreciation charge that can be levied on a property. This constraint on depreciation assessments is esoteric and parochial to rating valuation in Tanzania only. The law permits the charging of depreciation on old properties subject to a maximum charge of 25% and not beyond, even for what is a dilapidated property.

The following graduated depreciation schedule was developed and employed in the Mtwara-Mikindani rating project (See Table 3.2 below).

Table 3.2: Graduated Depreciation Schedule

Observed Condition of a Property	Depreciation Deduction (%)
Very Good	1 - 5%
Good	6 - 10%
Fair	11 - 20%
Poor	21 - 25%

Source: Mtwara-Mikindani Municipal Council, 2012

Another unique feature of property rating in Tanzania is that the tax base is based on the value of improvements on the land component only (S. 21 and 22 of The Urban Authorities (Rating Act) 1983). Land value is not taken into account in rating valuation. This is attributed to historical origins of rating valuation in the country (Kelly, R. and Masunu, Z. 2000). The Urban Authorities (Rating Act) 1983 was formulated at a time when the country was following socialist policy. One of the key tenets of the socialist policy was that land is vested in the President of the United Republic of Tanzania as trustee for all Tanzanians and that land is not a tradable commodity. A reversal of the policy on non-marketability of land came about with the passing of the National Land Policy in 1995 and the enactment of the Land Act No. 4 of 1999. The National Land Policy and the Land Act clearly acknowledged that land has commercial value and that value should be taken into account in any transaction involving land. Despite the pronouncements in the National Land

Policy in 1995 and the enactment of the Land Act No. 4 of 1999 rating valuation still follows the old 1983 piece of legislation and does not take into account the value of land in determining the rateable value of a property.

Location and neighbourhood characteristics are key determinants of value. In recognition of this fact, the Mtwara-Mikindani valuation team saw a need to factor-in locational attributes into the rating valuation model (see Equation 3.1 above) by including a Location Adjustment Factor (LAF) to take into account the influence of location on property value. The valuation team developed a bespoke rating valuation model that is based on the Cost Method of valuation and “laced” with market value considerations, in effect creating a hybrid “Cost-Value” valuation model.

To reflect the relative importance of location characteristics and attributes, Location Adjustment Factors (LAF) were applied to the mathematical valuation model. The construction of LAF’s was preceded by the determination and delineation of Location Adjustment Zones (LAZ). These are areas with homogeneous or near homogeneous characteristics in terms of land use, infrastructure, social amenities, quality of neighbourhood and land value. Location Adjustment Factors were derived by comparing the land value per square metre of a given LAZ relative to that of a benchmark LAZ. A total of 11 Location Adjustment Zones and Location Adjustment Factors (LAF’s) were identified in Mtwara-Mikindani. LAZ’s were independent of and could traverse different ward administrative boundaries in the municipality. These LAZs are shown in Table 3.3 and Figure 3.1 below.

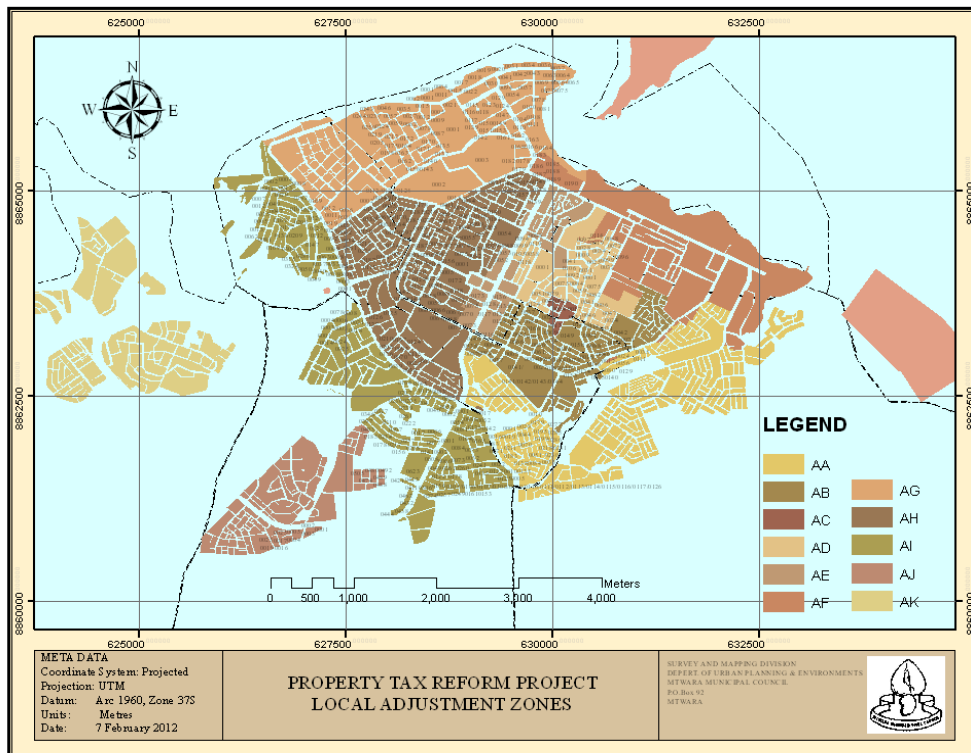
Table 3.3: Location Adjustment Zones and Location Adjustment Factors

S/n	Location Adjustment Zone	Location Adjustment Factor
1.	AA	0.22
2.	AB	0.67
3.	AC	4.44
4.	AD	1.78
5.	AE	4.44
6.	AF	2.00
7.	AG	1.75

S/n	Location Adjustment Zone	Location Adjustment Factor
8.	AH	1.59
9.	AI	0.67
10.	AJ	0.67
11.	AK	0.67
12.	AL	1.00
13.	AM	0.72
14.	AN	0.72
15.	AO	0.89

Source: Mtwara-Mikindani Municipal Council, 2012

Figure 3.1: Location Adjustment Zones in Mtwara-Mikindani Municipality



Source: Mtwara-Mikindani Municipal Council, 2012

To illustrate the workings of the Mtwara-Mikindani rating valuation model, suppose a house that was in good condition and located in LAZ “AD”, had a built up area of 200 square metres, constructed of brick walls, clay tile roof, gypsum ceiling and sand and cement screed floor finish(SCS), the model would generate the Property Rate (PR) or total property tax liability for the house as follows (TZS):-

$$PR=200*125*1.00*1.15*1.100(1-0.08)*1.78=51,789.....(Eq. 3.2)$$

The inputs that have been used in equation 3.2 are as summarised in Table 3.4 below.

Table 3.4: Summary of Inputs for Valuation Model

PR	BA	BR	QM				DE PR	LAF
			Brick walls	Clay tile roof	Gypsum board ceiling	SCS		
PR	200	125	1.00	1.15	1.1	1.00	8%	1.78

The model presented in equation 3.1 can also be modified to calculate Property Value (PV) as follow:

$$PV=BA*UR*QM*(1-D)*LAF \text{ (Eq.3.3)}$$

Where:

PV = Property Value

UR = Unit Rate of cost per square metre

The other notation remains the same as in equation 3.1 above.

When equation 3.3 is used to calculate the property value, the value of the property whose “PR” was calculated in equation 3.2 can be established as follows (TZS):-

$$PV=200*250,000*1.00*1.15*1.10*(1-0.08)*1.78= TZS 103,578,200- \text{ (Eq. 3.4)}$$

When the Base Rate of 0.05% is applied on the property value of T.shs. 103,578,200.00, PR is established as T.Shs. 51,789.10. This demonstrates that the Mtwara-Mikindani rating valuation model can readily be employed to calculate directly both the levy or property tax payable by a taxpayer or, alternatively, a variant of the model can be used to capture the capital value of the property.

4.2 Valuation of High-Value Properties

It was expected that the computer-assisted mass valuation/rating system would have been able to efficiently assess rates for almost all types of properties in the jurisdiction. However, to improve the equity of the rating system, Mtwara-Mikindani Municipal Council opted to conduct individual valuations for selected top-value (or unique) properties, such as cargo ports, telecommunication towers, high-rise luxury hotels, and so on. Fifty five properties were individually identified on the basis of heterogeneity.

After the individual valuation was completed, valuers entered the value of the properties into the Property Rate Information Management System (PRIMS). Property values estimated through the individual valuation process were made to suppress the estimated fiscal values generated by the mass valuation system. If a property value that was estimated individually existed, the billing module of the PRIMS used that value for producing the property rate bill.

3.3 Linkage between GIS and CAMA Technologies

The system is designed to include both property information and spatial data of each property captured in the digitised referenced map of Mtwara. Figure 3.2 below demonstrates how these two technologies are integrated, hence facilitating smooth property tax administration. For example the subject

property which is shaded red in the map was given PRN 0086, that facilitates property identification. It is also easy to know attribute information such as name of the owner, plot number (149), user (Residential), street (Indian Quarters) and so on as

there is a link between GIS and CAMA. The attribute data is obtained from the field or from the municipal Land Information Systems (LIS).

Figure 3.2: GIS-CAMA Interface in Mtwara-Mikindani Rating Valuation Project



Source: Mtwara–Mikindani Municipality, 2012

4.0 AN APPRAISAL OF THE MTWARA-MIKINDANI RATING PROJECT

The Mtwara-Mikindani rating valuation project is a pilot project that was intended to be replicated in other towns of Tanzania, beginning with Tanga Municipality. It is important, therefore, that an evaluation of the rating valuation project is carried out in order to ensure that the valuation model is refined before being applied to other urban authorities in Tanzania. As property rates are a major source of revenue for local authority sustenance in the country, the adoption of a systematic approach to property tax reform is critical to the success of the current government initiatives to bolster the functioning of local governments.

The Mtwara-Mikindani rating valuation project achieved phenomenal success in providing extensive valuation coverage within a short time span. A total of 12,000 properties were valued within a year between the first quarter 2010 and the first quarter of 2011. By comparison, valuations that were being carried out using the single parcel valuation approach were slow in attaining any meaningful valuation coverage. For example in Dar es Salaam the three municipalities of Ilala, Kinondoni and Temeke prepared supplementary valuations covering more than 32,000 properties using internally generated funds from 2003 to 2008 – i.e. over a period of five years. The number of properties valued in each municipality were Temeke 4,479 properties, Ilala 15,250 properties and Kinondoni 12,500 properties (Dar es Salaam City Progress Reports, 2008). This illustrates the sluggishness with which properties were valued in the past using the single parcel valuation approach. The total number of rateable properties in Mtwara-Mikindani is unknown, but according to the Mtwara-Mikindani Municipal Valuer, it is estimated that the total number of rateable properties ranges between 15,000 and 16,000. Hence, the Mtwara-Mikindani Municipal Council has attained a valuation coverage ratio of between 75% and 80% within a year which

constitutes phenomenal success. In relative terms, on this count, the Mtwara-Mikindani rating valuation project can be seen as a success story.

In terms of cost, the Mtwara-Mikindani rating valuation project has been conducted at a relatively low valuation cost per property. The total amount of funds that were used in the Mtwara-Mikindani rating valuation project is estimated to be T.Shs. 171,120,000 (US\$ 106,950) of which T.Shs. 155,920,000 (US\$97,450) was provided by GiZ and T.Shs. 15,200,000 (US\$7,500) by Mtwara-Mikindani Municipal Council. Hence, the total cost per property is estimated to be around T.shs. 14,260 (US\$ 9) per property. Comparable data on the number of properties valued, duration of the valuation exercises and valuation cost per property is provided in Table 4.1 relating to Temeke Municipal Council in Dar es Salaam.

Table 4.1: Rating Valuation Performance - Temeke Municipality

No	Description of Valuation Roll	No of Properties	Year	Duration	Cost per Property (TZS)	Cost per Property in (US\$)
1.	Phase I (Done under Urban Sector Engineering Project (USEP) -	2,516	1993/94	6 months	35,000	21.88
2.	Phase II (Done under Urban Sector Rehabilitation Project (USRP)	7,401	2000/2002	6 months	40,000	25.00
3.	Phase IIIA (Prepared using Temeke Municipal Council – Own source	1,885	2003	1 year	15,000	9.38
4.	Phase IIIB (Prepared using Temeke Municipal Council – Own source	2,500	2005	6 months	15,000	9.38
5.	High Valued Properties (Prepared under Local Government Support Programme (LGSP))	94	2006	3 months	50,000	31.25
	Total	14,396				

Source: Temeke Municipal Council, 2010

The rating valuation model developed for the Mtwara-Mikindani municipality is simple, intuitively appealing and easy to use. The use of the model is time-saving as it is capable of returning either the Property Rate (PR) or Property Value (PV) by simply entering relevant valuation parameters in the rating model specified in equation 3.1 and 3.3 respectively. The use of the model is also credited with separating the valuation function from the data capture function. In the Mtwara-Mikindani rating valuation project, students and graduates from a vocational training centre (VETA) were used to capture field data under the supervision of valuation surveyors. This separation of the valuation function from the data capture function freed professional Valuers from the chores of data capture and enabled them to concentrate on the professional valuation functions.

The model represents a systematic and methodical approach for estimating property rates and values for

rateable properties located within the municipality. In this regard, the use of the model is a step forward compared to the use of the single parcel based valuation approach. According to the Mtwara-Mikindani Municipal Valuer, the valuation model was validated by the Municipal Valuation office by comparing valuation results of the CAMA model with those produced by the traditional single parcel based valuation approach for few selected sample properties. Results of the tests indicated that the CAMA model was credible, producing valuations that fell within $\pm 10\%$ of values produced by the traditional single parcel based valuation approach. These results compare favourably with initial valuation variance tests that were conducted in Tanzania in the year 2004 (Geho, 2004). These tests found excessive valuation variance as being pervasive in Tanzania, typically in the order of +25 percent of the sale price. It appears, the valuation variance produced by the Mtwara-Mikindani rating valuation model compares favourably with valuation

variance found in UK, where valuers are confident of producing valuations that are within a range of ± 5 to 10 percent the correct value, and in extreme circumstances 20 percent (Royal Institution of Chartered Surveyors, 2003).

Mtwara-Mikindani is a small developing urban area, however, the local economy of the municipality has been depressed economy for a number of years, albeit it is now picking following the discovery of natural gas in the Mnazi-Bay Ruvuma River estuary. The property market is typically characterised by limited property market activity, with only few properties trading, often these being of a residential nature. The Mtwara-Mikindani property sub-market is a thin property market that is typically characterised by infrequent trading and unreliable property market data. Property market data is difficult to obtain on account of the secrecy with which property sale prices are handled with a view to evade Capital Gains Tax. In order to cope with the thinness of the Mtwara-Mikindani property sub-market, the rating valuation team developed a rating valuation method that addressed the twin problems of limited and obscure property market data. The rating model was based on the conventional DRC valuation model because cost data in the municipality is more readily available and more credible. The rating model went a step further and “laced” the DRC model with value considerations through the use of LAF’s. The Mtwara-Mikindani rating valuation team is, therefore, credited for generating a rating valuation model that is applicable in thin property markets.

While the cost of establishing a pilot rating valuation project in Mtwara-Mikindani municipality can be regarded as immense for a small municipal council like the Mtwara-Mikindani municipality, investment in the rating valuation infrastructure and model is credited for establishing a long-term backbone valuation infrastructure for the assessment of property rates in the municipality. Existing rating valuation infrastructure and the rating model will be

used to facilitate completion of valuation coverage in the Mtwara-Mikindani municipality and also in the preparation of supplementary valuation rolls. Hence, in the long run, current investment in the backbone valuation infrastructure for rating valuation is likely to prove cost effective as the rating cost per property will go down, far below the current US \$9 per property. Since a large part of the Mtwara-Mikindani municipality has already been digitised, there will be no need to measure building areas or record property addresses or take new photographs of properties unless significant change has taken place to the property by way of redevelopment, refurbishment, extension of buildings and so on. Digitisation and establishment of a property database will enable the carrying out of subsequent revaluations in Mtwara-Mikindani speedily and at relatively much lower cost.

Much as the Mtwara-Mikindani rating valuation project can be regarded as being analogous being “one step for man and one giant leap for mankind” as regards rating valuation practice in the country, the rating valuation project is not without its share of problems. There are several criticisms that can be levelled against the rating valuation project; the main ones are covered below.

The establishment of Location Adjustment Zones involves a significant amount of subjectivity and accordingly can potentially induce valuation variance for similar properties that are located in locations that are geographically apart. A given Location Adjustment Zone is regarded as a fairly homogeneous LAZ that takes into account the land use and typical property values in a neighbourhood. While this is the case, it remains possible to have a few or scattered atypical properties that are located within a LAZ. It is not practical to omit these few atypical properties in a LAZ since a LAZ is delineated as a whole area or neighbourhood, hence LAZ delineation cannot discriminate atypical properties that crop up in the LAZ area. Hence, the determination of LAZ’s is somewhat a broad brush

approach to the determination of homogeneous areas. The development of land value maps could in future be pursued as pockets of properties exhibiting atypical values in a neighbourhood could be reflected in such a map. It is also noteworthy that according to the Mtwara-Mikindani Municipal Valuer, between 3 and 5 properties were used to determine a LAZ depending on the size of the LAZ. Clearly, from the statistical point of view, 3 to 5 properties are insufficient to establish a LAZ with a good degree of confidence.

The assignment of Quality Multipliers (QM) for building cost is fraught with problems. The first problem is that of the level of subjectivity in assigning QMs. For instance, while the QM for a mud wall is 0.50, the QM for “no wall” is 0.62. Clearly, the logic here is difficult to grasp as “no wall” is perceived as being better than a mud wall. The second and more serious problem is that of the QMs considering mainly cost rather than value considerations in the generation of the QMs. For instance, while the logic of assigning a QM of 0.5 for a mud wall and 0.70 for metal sheet walling is understandable as a metal sheet wall would be more expensive to construct compared to a mud wall, however from the valuation point of view, a metal sheet walling is less desirable and less valuable in the Mtwara-Mikindani setting on account of the hot weather in the municipality. Likewise, an asbestos sheet roof is accorded a QM of 1.06 compared to a metal sheet roof which has been assigned a QM of 1.0. Considering the health hazards that are typically associated with asbestos roofing material it would have been expected from the valuation point of view, that an asbestos roof would have a much lower QM compared to that of the standard roofing material of corrugated iron sheets. Similar arguments can be raised in disfavour of the high QM ratings for timber ceilings (QM = 1.15) as 'tongued and groove' (T&G) timber ceilings are now regarded as an outdated type of roofing material in Tanzania. The level of obsolescence that timber ceilings suffer in Tanzania should have had the effect of deflating the value of

timber ceilings, particularly where the timber ceilings are of T&G. Likewise, terrazzo floors are also outmoded in terms of what is considered a fashionable floor finish in Tanzania. Hence the relatively high QM rating of 1.10 for terrazzo is unjustified, notwithstanding that it is more costly to lay a terrazzo flooring than a sand and cement screed floor finish. In sum, the Quality Multipliers should not consider construction cost only; rather they should be revised so as to accord with the valuation perspective. The specification of QMs is further criticised for not recognising the importance of architectural design, building fixtures and the quality of finishes in determining property value. In this regard, the specification of QMs is seen as being both crude and overly simplistic.

The assessment of building depreciation on a graduated scale as shown in Table 4.2 is crude, overly simplistic and highly subjective. There is no justification given as to why a building in very good condition should be depreciated 1-5%. This implies even a newly constructed building would be depreciated between 1 and 5%. The range of percentage points for charging depreciation for a given condition of a property is 5% for “Very Good”, “Good” and for “Poor”. For the “Fair” category, the range is 10%. It remains unclear as to why this category is allowed a 10% range in the depreciation assessments while for the other categories the range is only 5%. The wide allowance of 10% in the depreciation assessments for the “Fair” condition can potentially lead to great disparities in the final value estimates arrived at by different valuers. Additionally, there are no clear guidelines as to what constitutes “Very Good”, “Good”, “Fair” or “Poor” condition for a property. In principle, this can potentially lead to a situation where one valuer assigns a property a “Good” rating deducting 6% as depreciation while another valuer assigns the property a “Fair” rating and deducting 20% in depreciation. The problem is particularly pronounced in judging borderline cases between for instance “Good” and “Fair” condition and between “Fair” and

“Poor” condition and so on. The subjectivity inherent in and the simplicity of making depreciation assessments is one of the key weaknesses of the Mtwara-Mikindani rating valuation model as it can potentially lead to the allied twin problems of 'valuation variation' and the 'valuation-versus-prices' phenomenon. Refinement of depreciation assessments is called for.

While the Mtwara-Mikindani rating valuation represents a departure from the single parcel based valuations, there is a glaring absence of local standards on mass appraisal of real property such as the elaborate standards that have been developed by the International Association of Assessing Officers in USA (IAAO, 2013). It is important that matters such as model structure, specification and calibrations, validation through ratio studies or other methods are outlined and standardised in the country. Lack of quality assurance mechanisms is another key weakness of the Mtwara-Mikindani rating valuation project. Furthermore, the legal basis for carrying out CAMA in Tanzania is questionable. In most other taxing jurisdictions in the world, where CAMA is applied there would be specific legislation authorising the application of CAMA and the particular piece of legislation would cover how exactly CAMA should be carried out in practice.

The need to enact by-laws to support CAMA application is supported by the office of Prime Minister Regional and Local Government (PMO-RALG) which has categorically stated: 'To implement the proposed property rate system, the local government authority must apply for approval of by-laws with the ministry. An order of the Minister is needed when a method other than flat rate or market/replacement value is used. This ministerial order as published in the Gazette is a legal precondition for the establishment of the proposed rate system in that it includes the adjustment factor' (PMO-RALG, 2013).

Finally, it is notable that the Mtwara-Mikindani rating valuation model cannot be statistically tested. This is a critical weakness of the model as it is difficult to determine the statistical validity of value estimates generated by the model. Unlike the bespoke Mtwara-Mikindani rating valuation model, regression based CAMA models are amenable to statistical testing and are capable of showing the validity of the regression model and the predictive power of the regression model with sufficient statistical rigour. Much as it is claimed that the Mtwara-Mikindani rating valuation model was tested by comparing results of the rating model to those produced by the traditional single parcel based valuation approach, there are no assurances on the rigour of the tests that were conducted. It is claimed that valuation results of the Mtwara-Mikindani rating valuation model range between $\pm 10\%$ of the value produced by the traditional single parcel valuation approach. Considering the limited rigour with which the tests were conducted, it is probable that the test results are more of a conjectural occurrence than real results. Validation of the Mtwara-Mikindani rating valuation model needs to be conducted more rigorously with a view to eliminating, or at least minimising, fictional or synthetic rateable values.

5.0 CONCLUSION AND RECOMMENDATIONS

The Mtwara-Mikindani rating valuation project lays a good foundation stone for subsequent rating valuation exercises in other tax jurisdictions in Tanzania where the model would be replicated. Relative to the conventional single parcel valuation based approach, the Mtwara-Mikindani rating valuation model enables the carrying out of valuations speedily, inexpensively and using limited professional valuation experts. Through the integration of CAMA and GIS in the PRIMS software, data capture in subsequent years will be less tedious and less time-consuming as the whole of the Mtwara-Mikindani municipality will have been digitised.

Despite the strong-points of the Mtwara-Mikindani rating valuation project, negative issues surrounding the rating valuation project as pointed out above require to be addressed if the efficacy of mass rating valuations in Mtwara-Mikindani and subsequent project towns is to be scaled up.

Stemming from the foregoing discussion on the noted flaws of the Mtwara-Mikindani pilot CAMA-based rating valuation project, the following issues need to be addressed so as to improve on the efficacy of mass rating valuation in Tanzania. It is recommended that the construction of LAZs be refined; calibration of Quality Multipliers should be properly made to take into account value rather than merely cost considerations; a more elaborate model for assessing depreciation be generated; robust local standards on mass appraisal be developed; an appropriate legal backing for the CAMA rating model be secured and finally, the Mtwara-Mikindani rating valuation model should be validated rigorously before it is replicated to other urban authorities in Tanzania.

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