

## Questionnaire for the development of ISO 19152:2012 LADM Valuation Module

The ISO 19152:2012 Land Administration Domain Model (LADM) presents a conceptual schema for the specification of property units and their legal and geometric characteristics recorded at cadastre and land register, and relates these datasets with other property related datasets (e.g. addresses, utility networks, building (units), valuation, taxation, land use, land cover) recorded at external registrations.

A recently initiated collaborative research aims at developing a LADM based international information model for one of these external registrations, namely in terms of a Valuation Module for the ISO 19152:2012 LADM. The purpose of this research is to define the semantics of valuation information maintained by public authorities especially for recurrent taxes on immovable property<sup>1</sup>, and to extend the scope of LADM from a fiscal perspective to provide an information model that could be used to construct information systems for immovable property valuation. The preliminary results of this research were documented at the 11<sup>th</sup> 3D Geoinfo Conference<sup>2</sup>.

This questionnaire is prepared as a part of methodology applied for the above-mentioned research which is also supported by FIG Presidency and Chair of FIG Commission 9 Valuation and the Management of Real Estate. The purpose of the questionnaire is to create a world-wide inventory that reveals commonalities and differences among valuation systems used for recurrently levied immovable property taxes. The result of the questionnaire is expected to provide an understanding of the situation of valuation systems, and will be used as source data for the elaboration of the LADM Valuation Extension Module.

Please reply the following questions, and contact us if you have any comments and suggestions:

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<sup>1</sup> Recurrent taxes on immovable property covers taxes levied regularly in respect of the use or ownership of immovable property. These taxes are levied on land and buildings, in the form of a percentage of an assessed property value based on a national rental income, sales price, or capitalised yield; or in terms of other characteristics of real property (e.g., size or location) from which a presumed rent or capital value can be derived. They can be levied on proprietors, tenants, or both; they can also be paid by one level of government to another level of government in respect of property under the jurisdiction of the latter (The OECD classification and interpretative guide 2015, <http://www.oecd.org/tax/tax-policy/oecd-classification-taxes-interpretative-guide.pdf>)

<sup>2</sup> For more information, see: <http://www.isprs-ann-photogramm-remote-sens-spatial-inf-sci.net/IV-2-W1/145/2016/>

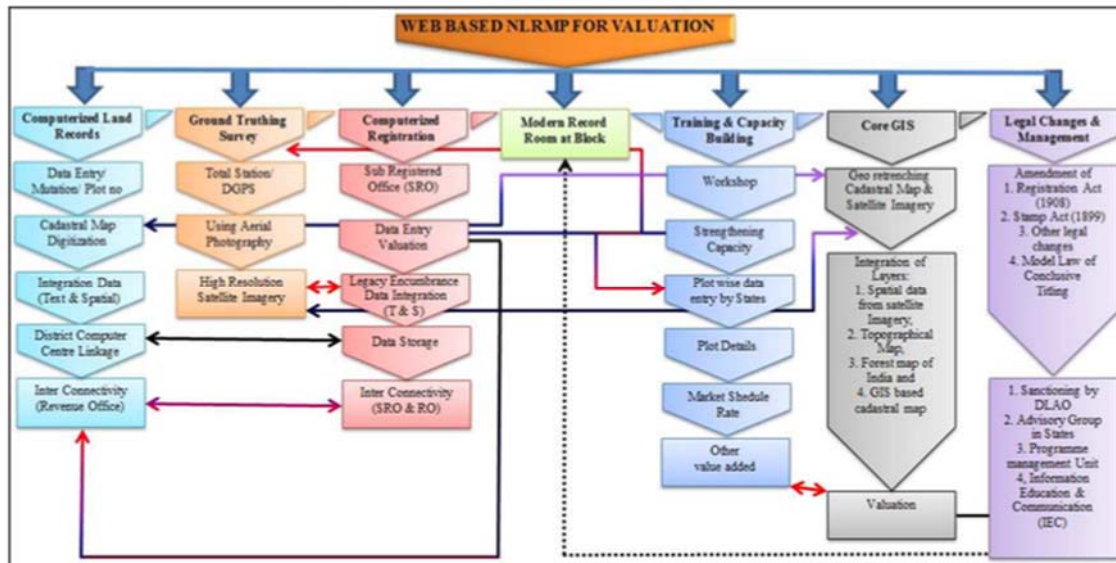
## Section A. General questions for property valuation systems in India

Questions	Responses
<p>1. Please indicate the organizations responsible for valuation of properties for property taxation purposes?</p>	<p>Land is a state list topic in india. So every state government has its local bodies for collecting taxes.</p> <p>Market value is defined by the inspector general of stamps and duties. So taxes are collected by the corresponding local governments</p> <p>Ex : Andhra pradesh is the ranked as No 1 amongst states of india in ease of doing business as per the World bank report. Property tax is collected by the commissioner of the revenue department / director of Municipal administration. The Revenue section of the ULB/Municipal body is responsible for administration of property taxation for that respective ULB.</p> <p><a href="http://cdma.ap.gov.in/en/property-tax">http://cdma.ap.gov.in/en/property-tax</a></p>
<p>2. What are the objects of valuation for property taxation (e.g. unimproved parcel, building)?</p>	<p>Rentals of similar or comparable properties in the vicinity; the size of the property; location of the property; the condition of the property; and other relevant physical attributes.</p> <p>The property characteristics, location, construction cost, rent, sale price etc. are factors, which contributed to the valuation.</p> <p>Plinth area, zonal location of the property, Residential/Non-residential status, age of the property, type of construction and other parameters applicable to specific situations</p>
<p>3. Please define value type (e.g. market value, tax value, capital value) used for property taxation?</p>	<p>There are two basic forms of property taxation: the property tax may be levied on the annual or rental value of the property. and the capital value of land and improvements. The annual or rental value system is the property assessment according to some estimate of rental or net rent, whereas the capital value system is based on market price</p> <p>Property value can be denominated in two ways: either on the basis of the rent of the property would be expected to yield (its annual rental value or ARV) or according to its expected sales price (termed capital</p>

	<p>or market value).</p> <p>Property tax is assessed for each property located in the limits of the ULB based on the Annual Rental Value and the Taxation rate. The Annual Rental Value of a property is calculated based on parameters like Plinth area, zonal location of the property, Residential/Non-residential status, age of the property, type of construction and other parameters applicable to specific situations. The Town planning section of the ULB provides all the details of the property with reference to its physical status and modifications.</p>
<p>4. Please explain how public registry datasets (e.g. cadastre, land registry, building registry) are used in valuation procedures?</p>	<p>In the property registers information is gathered from the self declaration of property owners and also from field data collection by Tax Inspectors and Bill Collectors of revenue department. During the general assessment in 1999s, self-declared data were used for valuation purposes other than field data were collected from spot verification for valuation. .</p> <p>Property and Vacant Land Tax Information System (PTIS) is a webbased software module that helps municipal corporations manage property and vacant land taxation, efficiently and effectively. The system brings in accountability and transparency in the decision making process of the revenue department of a municipal corporation. It provides comprehensive information about a property such as: Property details Property tax estimate Mutation of property Payments against the property Demand collection &amp; balance (DCB) of the property</p>
<p>5. Which methods are applied for collecting market data needed for valuation?</p>	<p>Ex: GHMC (greater hyderabad municipal corporation)</p> <p>extracting data from the official's documents and other sources. Total 450 properties data has been collected from the property tax registers of GHMC, which are in the time period from 1999 to 2009.</p> <p>Primary data collection: The primary data</p>

	<p>is collected from the officials and property owners through meetings and interviews. These interviews and meetings were conducted using selected questionnaires to collect information about the present valuation system, its merits and demerits, problems, and user needs with regards to valuation of property.</p> <p>Secondary Data collection : The secondary data about property were collected from property registers of Revenue Department of GHMC, which were gathered from self declaration and field data collection.</p>
<p>6. Is there any special valuation database for storing datasets <i>used in</i> (e.g. property characteristics) or <i>produced with</i> (e.g. sales statistics) valuation procedures? If yes, please give the name of database, indicate responsible authority, and describe its content.</p>	<p>Yes, Housing development board has the database.</p> <p>In the property registers of the following information are recorded; holding number, Owners name, road / muhalla name, ward number, ward name, property type, nature of construction, condition of building, number of room, number of bathroom, total floor area (in sqft), number of storey, date of valuation, annual rental value (in INR). All these information were collected during field work.</p> <p>Property and Vacant Land Tax Information System (PTIS) is a webbased software module that helps municipal corporations manage property and vacant land taxation, efficiently and effectively. The system brings in accountability and transparency in the decision making process of the revenue department of a municipal corporation. It provides comprehensive information about a property such as: Property details Property tax estimate Mutation of property Payments against the property Demand collection &amp; balance (DCB) of the property</p>
<p>7. Is there a web-based dissemination of valuation information? If yes, please indicate which data (e.g. sales statistics) is open to the public.</p>	<p>yes, The Government of India has decided to implement the Centrally-Sponsored scheme in the shape of the National Land Records Modernization Programme (NLRMP) by merging two existing Centrally-Sponsored Schemes of Computerization of Land Records (CLR) and Strengthening of Revenue Administration and Updating of Land</p>

	<p>Records (SRA&amp;ULR) in the Department of Land Resources (DoLR), Ministry of Rural Development. The integrated programme would modernize management of land records, minimize scope of land/property disputes, enhance transparency in the land records maintenance system, and facilitate moving eventually towards guaranteed conclusive titles to immovable properties in the country.</p>
<p>8. How frequently are general revaluations made?</p>	<p>Under the revaluation model, the valuation of assets is continually reviewed to reflect the fair market value as far as possible. Frequency is dependent on the burden for the exchequer.</p> <p>Ex : The move is expected to fetch an additional revenue of Rs 1,000 crore annually to the cash-starved exchequer. The Andhra pradesh government, in fact, had increased the market rate of land across the state by about 30 per cent in August last year. This added about Rs 1,200 crore to the coffers.</p>
<p>9. Is there a system of indexation affecting property value between regular revaluations?</p>	<p>There is a system and is defined based on the need for the exchequer. It is usually decided by the Commissioner of Revenue administration.</p>
<p>10. Do taxpayers have a right to appeal against the appraised values? If yes, please indicate how disputes are resolved.</p>	<p>A grievance mechanism can be submitted online.</p>



Please continue with Section B, if mass appraisal procedures are applied in your country for immovable property taxation. If single property appraisal methods are used -even if as complementary part of mass appraisal, please answer questions given in Section C.

### Section B - Questions for mass appraisal procedures

Questions	Responses
1. Do you have a (computer aided) mass appraisal system in your country? If yes, please indicate also responsible authorities.	Yes
2. Is there any other use of the mass appraisal system than property taxation?	Yes
3. Which CAD/GIS/CAMA (Computer-aided design / Geographic information system / Computer Assisted Mass Appraisal) software packages are used in mass appraisal?	Comparable sales analysis in which the system selects comparables closest to the subject obviating the necessity of an appraiser having to search through sales data to find comparables and adjust them for comparability GIS has become an important and useful tool with multiple regression analysis to develop the valuation model
4. Which geographical or spatial datasets are used in mass appraisal? Please describe the source of these datasets.	Ex: Esri's ARCGIS tool is used for mass appraisals.
5. Which geographic or spatial analysis methods (e.g. visibility analysis, proximity analysis) are applied in mass appraisal?	a hedonic price model is used to estimate housing price. The variables adopted include floor area of the housing unit, floor level of the housing unit, age, distance from central business district and distance from the mass

	rapid transit station.
6. Is three-dimensional (3D) data used in mass appraisal? Please describe source of 3D data (e.g. floor plans).	Yes, the floor plans are already being used in some of the states for example in Andhra Pradesh. they are coupled with Indian Land Consolidation: Mass Appraisals of Indian Lands from the US inspector General - office of the interior.
7. Is there any relationship between the CAMA system and other public registers (e.g. cadastre, land registry, building registry, ..)?	Yes cama system links with GIS based systems and these are linked to land registry and varies from state to state.
8. Please describe the statistical models (e.g. additive, multiplicative) applied in mass appraisal according to type or functions of properties?	Multiplicative model are being used with mass appraisal.
9. Please indicate statistical analysis methods (e.g. multiple regression analysis, artificial neural network) applied in mass appraisal?	The Additive Multiple Regression Model (AMRA) has been developed and used. The objective of AMRM, as applied to mass appraisal, is to model the relationship between property characteristics (independent variables) to property value (dependent variable), so that the latter can be estimated from the former.
10. Which legal characteristics (e.g. property rights) are used as variables in mass appraisal models? Please describe the source of these characteristics.	legal characteristics like mortgages are used during the AV model in mass appraisal. Although it is claimed as fledgling stage some of the big 4 banks are relying on this methodology
11. Which land use characteristics (e.g. land use zones) are used as variables in mass appraisal models? Please describe the source(s) of these characteristics.	cbd and non cbd area
12. Which environmental and locational characteristics (e.g. location nuisance, distance to points of interest / POIs, environmental risks) are used as variables in mass appraisal models? Please describe the source(s) of these characteristics.	nearness to the river, traffic connection / infrastructure parking space parks and green areas age of building within a district shopping centers markets retails traffic noise and pollution playgrounds cultural,entertainment and sport points prestige planned future development distance from cbd, distance from the mrt etc
13. Which building or improvement characteristics (e.g. number of unit, construction type and material) are used as variables in mass appraisal models? Please describe the source(s) of these characteristics.	Identification (plot number) Location Land description (area, permitted use) Building description (area, age, materials, quality) Taxpayer (not essential)
14. Does the mass appraisal system applied in your country have a performance analysis stage (e.g. 'ratio study')? If yes, please describe the indicators used in the performance analysis.	state government's reviews the AV of properties yearly or such time to reflect the changes in the market rental values of comparable properties. The AV will be amended if the latest market rent data no longer support your existing AV.
15. Please indicate whether single property appraisal is applied for improving accuracy of mass appraisal estimations.	The commissioner of municipal Administration to improve Accuracy of the AV of properties frequently to reflect the changes in the market rental values of comparable properties. so single property

	appraisal is done only when there is change of the usage of the property and has been notified after change.
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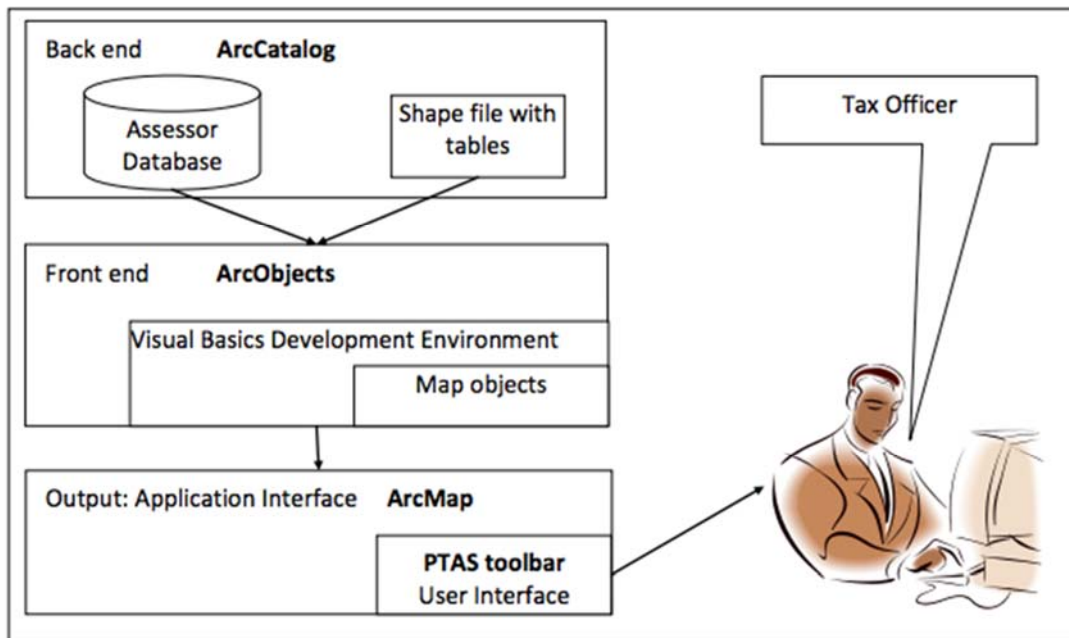


Fig: 1 – Block diagram illustrating the integration of Geographic Information System & Property Tax mapping

### Section C. Questions for single property valuation procedures

Questions	Responses
1. Which valuation methods are used for single property appraisal? Please relate valuation methods with the type of valuation objects (e.g. sales comparison approach for unimproved parcels).	yes hedonic models with AV
2. Which geographical or spatial datasets are used for single property appraisal? Please describe the source(s) of these datasets.	
3. Which legal property characteristics (e.g. property rights) are taken into account for single property appraisal? Please describe also the source of these characteristics.	Mortgages
4. Which land use characteristics (e.g. land use zones) are taken into account for single property appraisal? Please describe also the source(s) of these characteristics.	cbd and non cbd area
5. Which environmental and locational characteristics (e.g. location nuisance, distance to POIs, environmental risks) are taken into account for single property appraisal? Please describe the source(s) of these characteristics.	Nearness to the river, traffic connection / infrastructure parking space parks and green areas age of building within a district shopping centers markets retails traffic noise and pollution playgrounds cultural
6. Which building or improvement characteristics (e.g. number of unit, construction type and material) are taken into account for single property appraisal? Please describe the source(s) of these characteristics.	Identification (plot number) Location Land description (area, permitted use) Building description (area, age, materials, quality)
7. If there is a special valuation database, please indicate which sales comparison method related data (e.g. comparable property identifiers, monetary adjustment for time, physical differences) are kept in this database.	It is dependent on the local government capacities. Ex : Property and Land tax valuation system in govt of Andhra pradesh

<p>8. If there is a special valuation database, please indicate which cost method related data (e.g. type and source of cost price, chronological age, depreciations) are kept in this database.</p>	<p>It is dependent on the local government capacities.  Ex :  Property and Land tax valuation system in govt of Andhra pradesh</p>
<p>9. If there is a special valuation database, please indicate which income valuation method related (e.g. gross income, net income, capitalization rate, discount rate) are kept in this database.</p>	<p>It is dependent on the local government capacities.  Ex :  Property and Land tax valuation system in govt of Andhra pradesh</p>

**Section D. Information concerning respondent(s)**

<b>Questions X..Y</b> have been answered by	<b>Respondent</b>
1. Name	Manohar Velpuri
2. Affiliation / position	FIG commission 9, Vice chair
3. Country	Denmark/Singapore/India
4. E-mail	manohar.velpuri@gmail.com
5. Comments	Sources : 1) <a href="http://www.esri.in">http://www.esri.in</a> 2) Web Based Land Valuation System in Infrastructure Planning in India: An Approach Bikram Kumar Duttaa 3) Andhra Pradesh Municipal Asset Valuation Methodology Manual 4) <a href="http://cdma.ap.gov.in/sites/default/files/ptis.pdf">http://cdma.ap.gov.in/sites/default/files/ptis.pdf</a>

<b>Questions Z..A</b> have been answered by	<b>Respondent</b>
1. Name	
2. Affiliation / position	
3. Country	
4. E-mail	
5. Comments	