EXTENDED LADM COUNTRY PROFILE FOR PROPERTY VALUATION IN SERBIA

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INTRODUCTION

- Real properties - important and valuable resources for the economy of every country
- The need for valuation arises in taxing, in real estate transactions, in taking mortgage loans, in litigation, in making investment decisions and in other cases
- Real property valuation in Serbia – value of real property is defined on a certain date
- Many different factors directly or indirectly affect the value of real property
- In the paper we presented:
  - Analysis of national regulations
  - LADM based model for real property valuation in Serbia
    - The model is an extension of the previously developed Serbian LADM country profile
  - Valuation examples for the municipality of Novi Sad
PROPERTY VALUATION AND TAXATION IN SERBIA

In the Republic of Serbia, real property valuation is regulated by appropriate laws and bylaws:

- ‘The Law on State Survey and Cadastre’ (2009),
- ‘The Law on property tax’ (2001),

Key element for real property valuation are public registers:

- Real Estate Cadastre
- Real Estate Price Register
- Central Register of Planning Documents

The Real Estate Cadastre data are not sufficient for today's valuation practice!
PROPERTY VALUATION AND TAXATION IN SERBIA

- All data from sales contracts are entered into the system of the Real Estate Price Register system
  - data for the identification of transactions,
  - data on the price from transactions,
  - data on parties,
  - data on the type of the transaction,
  - basic data on real property
  - etc.

- An important factor in the assessment is also urban planning, possibilities and limitations of construction, current and planned land use and for such information the Central Register of Planning Documents is consulted.
PROPERTY VALUATION AND TAXATION IN SERBIA

- The law proposes individual and mass valuation.

- Three basic valuation methods are most often used in individual real property valuation:
  - cost-based approach,
  - sales comparison approach
  - and income capitalization approach.

- Mass valuation of real property is defined as the systematic valuation of a group of real properties on a given date, using standardized procedures (collection, verification and classification of physical, legal and market key characteristics of real property) and methods of mathematical statistics.
Establishment of a system of mass real property valuation should be carried out in several phases:

- preparation and adjustment of legal regulations;
- improvement of the real estate price register;
- verification and analysis of data from the real estate market;
- formation of a model for mass valuation;
- collection of assessment data for the entire real estate fund with the formation of the register of facilities and mass valuation of real properties.

In order to carry out all the steps, cadastral authority implemented Real Estate Price Register.

This register is the first step towards the mass valuation and it assures collection of data from the real estate market. Other steps have yet to be implemented.
PROPERTY VALUATION AND TAXATION IN SERBIA

- Real property valuation in Serbia is the responsibility of several institutions:
  - tax administration,
  - local self-government,
  - the cadastral authority,
  - court experts
  - and certified appraisers.

- Obligations of mutual cooperation are not legally defined, so real property valuation data are duplicated and collected in different ways and for different needs.

- The value of real property in tax administration is determined by a usable area and an average price per square meter of the corresponding real property in the zone where the real property is located.

- Average prices are determined by zones for the appropriate types of real property.

- Based on the real property transaction prices by zones, the average price of the real property by the zone is determined.

- At least three transactions in the zone are required.
PROPERTY VALUATION AND TAXATION IN SERBIA

- When the market value is determined by the tax authorities, the basic problem is that they do not have sufficient data on real property and rights to them, due to the lack of connection between tax and cadastral authorities.

- One way to solve this problem is to ensure that tax authorities can obtain up-to-date data on properties.

- This can be done by implementing SOA on top of the real estate cadastre data and that way to provide access to real-time data.

- Also, one of the most important roles of the system for mass valuation is the calculation of property taxes, and it is based on postulates that ensure fairness, equality and uniformity. Full implementation of such system could solve mentioned problem as well.
DATA MODEL FOR PROPERTY VALUATION

- The country LADM profile for Serbia is previously developed by the authors (2017)
- On top of that model an extension for property valuation is developed
- This model is based on the LADM Valuation Information Model which is to be the part 4 of new ISO 19152
LADM COUNTRY PROFILE

class RS-LADM profile

LA_Party
RS_Party
+ surname: CharacterString
+ middlename: CharacterString
+ personalid: Integer
+ address: RS_Address
+ personalNumber: Float
+ type: RS_PartyType
+ role: RS_PartyRoleType

LA_RRR
RS_RRR
+ rrr 0..*
+ party 0..1

LA_BAUUnit
RS_BAUUnit
+ type: RS_BAUUnitType
+ unit 1

LA_SpatialUnit
RS_SpatialUnit
«FeatureType»
+ type: RS_BAUUnitType
+ unit1 0..*

LA_LegalSpaceBuildingUnit
RS_LegalSpaceBuildingUnit
«FeatureType»
+ number: Integer
+ numidx: Integer
+ purposeParcel: RS_PurposeParcelType
+ planNum: CharacterString [0..1]
+ sketchNum: CharacterString [0..1]
+ maunal: Integer
+ year: Integer

LA_Party
RS_Party
+ party 0..1
+ rrr 0..*

LA_RRR
RS_RRR
+ rrr 1..*
+ unit 1

LA_BAUUnit
RS_BAUUnit
+ type: RS_BAUUnitType
+ unit1 0..*

LA_SpatialUnit
RS_SpatialUnit
«FeatureType»
+ type: RS_BAUUnitType
+ unit1 0..*

LA_LegalSpaceBuildingUnit
RS_LegalSpaceBuildingUnit
«FeatureType»
+ buildingNumber: Integer
+ buildDate: DateTime
+ use: RS_WayOfUseBuilding
+ legalStatusID: RS_LegalStatus
+ floorUnderground: Integer
+ groundFloors: Integer
+ aboveGroundFloors: Integer
+ atticFloors: Integer
+ ennum: int
+ UPIN: String

LA_Party
RS_Party
+ party 0..1
+ rrr 0..*

LA_RRR
RS_RRR
+ rrr 1..*
+ unit 1

LA_BAUUnit
RS_BAUUnit
+ type: RS_BAUUnitType
+ unit1 0..*

LA_SpatialUnit
RS_SpatialUnit
«FeatureType»
+ type: RS_BAUUnitType
+ unit1 0..*

LA_LegalSpaceBuildingUnit
RS_LegalSpaceBuildingUnit
«FeatureType»
+ buildingNumber: Integer
+ buildDate: DateTime
+ use: RS_WayOfUseBuilding
+ legalStatusID: RS_LegalStatus
+ floorUnderground: Integer
+ groundFloors: Integer
+ aboveGroundFloors: Integer
+ atticFloors: Integer
+ ennum: int
+ UPIN: String
class RS-LADM VALUATION

VM_Valuation
+ assessedValue: Double
+ dateOfValuation: Date
+ valuationApproach: RS_VM_ValuationApproach

VM_MassAppraisal
RS_VM_MassAppraisal

VM_TransactionPrices
RS_VM_TransactionPrices
+ dateOfContractOrDeclaration: Date
+ transactionPrice: Currency
- typeOfTransaction: RS_VM_TypeOfTransaction

VM_ValuationUnitGroup
RS_VM_ValuationUnitGroup
+ valuationGroupType: RS_VM_ValuationGroupType
- zone: RS_VM_Zone

VM_Valuation
RS_VM_Valuation
+ assessedValue: Double
+ dateOfValuation: Date
+ valuationApproach: RS_VM_ValuationApproach

VM_MassAppraisal
RS_VM_MassAppraisal

VM_SalesStatistics
RS_VM_SalesStatistics
+ dateOfAnalysis: Date
+ averagePricePerSquareMeter: Currency

VM_CondominiumUnit
RS_VM_PartOfBuilding

VM_SpatialUnit
«Feature Type»
RS_VM_Parcel
+ plannedLandUse: CharacterString
+ currentLandUse: CharacterString
+ irrigationSystem: CharacterString
+ drenaigeSystem: CharacterString

VM_Building
«Feature Type»
RS_VM_Building
+ constructionMaterial: RS_VM_ConstructionMaterial
+ heatingSystem: RS_VM_HeatingSystem
+ elevator: Boolean

VM_TransactionPrices
RS_VM_TransactionPrices
+ dateOfContractOrDeclaration: Date
+ transactionPrice: Currency
- typeOfTransaction: RS_VM_TypeOfTransaction

VM_ValuationUnitGroup
RS_VM_ValuationUnitGroup
+ valuationGroupType: RS_VM_ValuationGroupType
- zone: RS_VM_Zone

VM_SalesStatistics
RS_VM_SalesStatistics
+ dateOfAnalysis: Date
+ averagePricePerSquareMeter: Currency

VM_CondominiumUnit
RS_VM_PartOfBuilding

VM_SpatialUnit
«Feature Type»
RS_VM_Parcel
+ plannedLandUse: CharacterString
+ currentLandUse: CharacterString
+ irrigationSystem: CharacterString
+ drenaigeSystem: CharacterString

VM_TransactionPrices
RS_VM_TransactionPrices
+ dateOfContractOrDeclaration: Date
+ transactionPrice: Currency
- typeOfTransaction: RS_VM_TypeOfTransaction

VM_ValuationUnitGroup
RS_VM_ValuationUnitGroup
+ valuationGroupType: RS_VM_ValuationGroupType
- zone: RS_VM_Zone

VM_SalesStatistics
RS_VM_SalesStatistics
+ dateOfAnalysis: Date
+ averagePricePerSquareMeter: Currency

VM_CondominiumUnit
RS_VM_PartOfBuilding

VM_SpatialUnit
«Feature Type»
RS_VM_Parcel
+ plannedLandUse: CharacterString
+ currentLandUse: CharacterString
+ irrigationSystem: CharacterString
+ drenaigeSystem: CharacterString
VALUATION EXAMPLES FOR THE MUNICIPALITY OF NOVI SAD

- Three different cases for the municipality of Novi Sad:
  - urban area - buildings with apartments and business spaces,
  - suburbs - mostly residential houses,
  - and rural settlements with agricultural land.

- For this analysis the Real Estate Cadastre, the Real Estate Price Register and the Central Register of Planning Documents are consulted.
VALUATION EXAMPLES FOR THE MUNICIPALITY OF NOVI SAD

- Cadastral municipality Rumenka
- Valuation of agricultural parcel 3453 area 1113m²
<table>
<thead>
<tr>
<th>number</th>
<th>purposeParcel</th>
<th>wayuse</th>
<th>area</th>
<th>address</th>
<th>utilityServices</th>
<th>type</th>
<th>zone</th>
<th>plannedLandUse</th>
<th>currentLandUse</th>
<th>irrigationSystem</th>
<th>drenageSystem</th>
<th>landClass</th>
<th>bonitet</th>
<th>dateOfContractOrDeclaration</th>
<th>transactionPrice</th>
<th>typeOfTransaction</th>
<th>averagPricePerSquareMeter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3521</td>
<td>agricultural land</td>
<td>filed</td>
<td>1158</td>
<td>Leje</td>
<td>0</td>
<td>parcel</td>
<td>4</td>
<td>agricultural land</td>
<td>agricultural land</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>8.7.2020</td>
<td>contract</td>
<td>2.071</td>
<td></td>
</tr>
<tr>
<td>3699</td>
<td>agricultural land</td>
<td>filed</td>
<td>1174</td>
<td>Leje</td>
<td>0</td>
<td>parcel</td>
<td>4</td>
<td>agricultural land</td>
<td>agricultural land</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>19.7.2021</td>
<td>contract</td>
<td>1.91</td>
<td></td>
</tr>
<tr>
<td>3624</td>
<td>agricultural land</td>
<td>filed</td>
<td>1032</td>
<td>Leje</td>
<td>0</td>
<td>parcel</td>
<td>4</td>
<td>agricultural land</td>
<td>agricultural land</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>5.11.2020</td>
<td>contract</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>3453</td>
<td>agricultural land</td>
<td>filed</td>
<td>1113</td>
<td>Leje</td>
<td>0</td>
<td>parcel</td>
<td>4</td>
<td>agricultural land</td>
<td>agricultural land</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>2450€</td>
<td>sales comparison</td>
<td>2.45</td>
<td></td>
</tr>
</tbody>
</table>
VALUATION EXAMPLES FOR THE MUNICIPALITY OF NOVI SAD

- Cadastral municipality Sremska Kamenica
- Valuation of the residential house no. 1 with area 112m² on parcel 4221/3
<table>
<thead>
<tr>
<th>Number</th>
<th>Purpose Parcel</th>
<th>Parcel Type</th>
<th>Parcel Area</th>
<th>Building Number</th>
<th>Use</th>
<th>Area</th>
<th>Build Date</th>
<th>Legal Status</th>
<th>Utility Services</th>
<th>Construction Material</th>
<th>Heating System</th>
<th>Elevator</th>
<th>Date of Contract or Declaration</th>
<th>Transaction Price</th>
<th>Type of Transaction</th>
<th>Average Price per Square Meter</th>
<th>Assessed Value</th>
<th>Valuation Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>4221/3</td>
<td>Urban construction land</td>
<td>447</td>
<td>1</td>
<td>112</td>
<td>Residential</td>
<td>112</td>
<td>2002</td>
<td>Building</td>
<td>Electricity, Sewerage, Water, Heating, Telecommunication</td>
<td>Brick</td>
<td>Gas Heating</td>
<td>Date not specified</td>
<td>Date not specified</td>
<td>Type not specified</td>
<td>Date not specified</td>
<td>Assessed Value: 143647€</td>
<td>Sales comparison</td>
<td></td>
</tr>
</tbody>
</table>

Number: Unique identifier for each record.
Purpose Parcel: The purpose of the parcel.
Parcel Type: Type of parcel.
Parcel Area: Area of the parcel in square meters.
Building Number: Number of the building.
Use: Type of use.
Area: Area of the building in square meters.
Build Date: Date of building construction.
Legal Status: Legal status of the building.
Utility Services: Services available in the building.
Construction Material: Material used in construction.
Heating System: Heating system used.
Elevator: Presence of an elevator.
Date of Contract or Declaration: Date of contract or declaration.
Transaction Price: Price of the transaction.
Type of Transaction: Type of transaction.
Average Price per Square Meter: Average price per square meter.
Assessed Value: Assessed value of the property.
Valuation Approach: Approach used for valuation.
VALUATION EXAMPLES FOR THE MUNICIPALITY OF NOVI SAD

- cadastral municipality Novi Sad II

- Two-rooms apartment, area 56m² within the building 1 on parcel 3931/5
<table>
<thead>
<tr>
<th>Number</th>
<th>Way use</th>
<th>Building number</th>
<th>Building date</th>
<th>Type</th>
<th>Room</th>
<th>Floor</th>
<th>Unit number</th>
<th>Area</th>
<th>Utility services</th>
<th>Construction material</th>
<th>Heating system</th>
<th>Elevator</th>
<th>Date of contract or declaration</th>
<th>Transaction price</th>
<th>Type of transaction</th>
<th>Average price per square meter</th>
<th>Assessed value</th>
<th>Valuation approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>3930/11</td>
<td>Residential</td>
<td>1</td>
<td>2002</td>
<td>Apartment</td>
<td>Two rooms</td>
<td>First floor</td>
<td>321</td>
<td>54</td>
<td>Electricity, sewerage, water, heating, telecommunication</td>
<td>Reinforced concrete</td>
<td>Central heating</td>
<td>1</td>
<td>22.12.2021</td>
<td>82000€</td>
<td>Contract</td>
<td>1518</td>
<td></td>
<td>Sales comparison</td>
</tr>
<tr>
<td>3931/29</td>
<td>Residential</td>
<td>1</td>
<td>1988</td>
<td>Apartment</td>
<td>Two rooms</td>
<td>Second floor</td>
<td>173</td>
<td>53</td>
<td>Electricity, sewerage, water, heating, telecommunication</td>
<td>Reinforced concrete</td>
<td>Central heating</td>
<td>1</td>
<td>4.2.2022</td>
<td>69000€</td>
<td>Contract</td>
<td>1302</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3930/42</td>
<td>Residential</td>
<td>3</td>
<td>2000</td>
<td>Apartment</td>
<td>Two rooms</td>
<td>First floor</td>
<td>8</td>
<td>55</td>
<td>Electricity, sewerage, water, heating, telecommunication</td>
<td>Reinforced concrete</td>
<td>Central heating</td>
<td>1</td>
<td>27.12.2021</td>
<td>74250€</td>
<td>Contract</td>
<td>1350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3931/5</td>
<td>Residential</td>
<td>1</td>
<td>1989</td>
<td>Apartment</td>
<td>Two rooms</td>
<td>First floor</td>
<td>115</td>
<td>56</td>
<td>Electricity, sewerage, water, heating, telecommunication</td>
<td>Reinforced concrete</td>
<td>Central heating</td>
<td>1</td>
<td>22.12.2021</td>
<td>77840€</td>
<td></td>
<td></td>
<td></td>
<td>Sales comparison</td>
</tr>
</tbody>
</table>
CONCLUSION

- In Serbia, the valuation is performed individually, while the law also prescribes a mass valuation of real properties.

- The implementation of mass valuation is still under development. As one of the first steps, the Real Estate Price Registry was built and within it, information on real property transactions is recorded.

- LADM country profile for Serbia was developed previously. Since the valuation is envisaged to be found in Part 4 of the LADM standard, in this paper the existing country profile has been extended to contain valuation information.

- In future work, the values of the code lists will be defined in accordance with the law and rule books.

- This model, as well as the implementation of mass valuation will contribute to faster, more accurate and fairer valuation.
CONCLUSION

- Tax administration is responsible for taxation process.

- In this process, information on real properties is often duplicated and not up-to-date, and the right holders are left with the obligation to update this information.

- Since most of the data necessary for taxation is available from the cadastral records, the development of a service-oriented architecture would enable the delivery of current data in real time.

- As future work, the web services that would enable the delivery of current data, and harmonization of the existing code lists between two organizations will be implemented.
Thank you for your attention!