Posible Socio-Economic Reflections of 3D Cadastre Studies

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PRESENTATION PLAN

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1. INTRODUCTION

With the developing information and communication technology, the interests and needs of the human being, who is a socio-economic entity, have also changed. The change of interests and needs has triggered the improvement and development of solutions offered by information and communication technology.
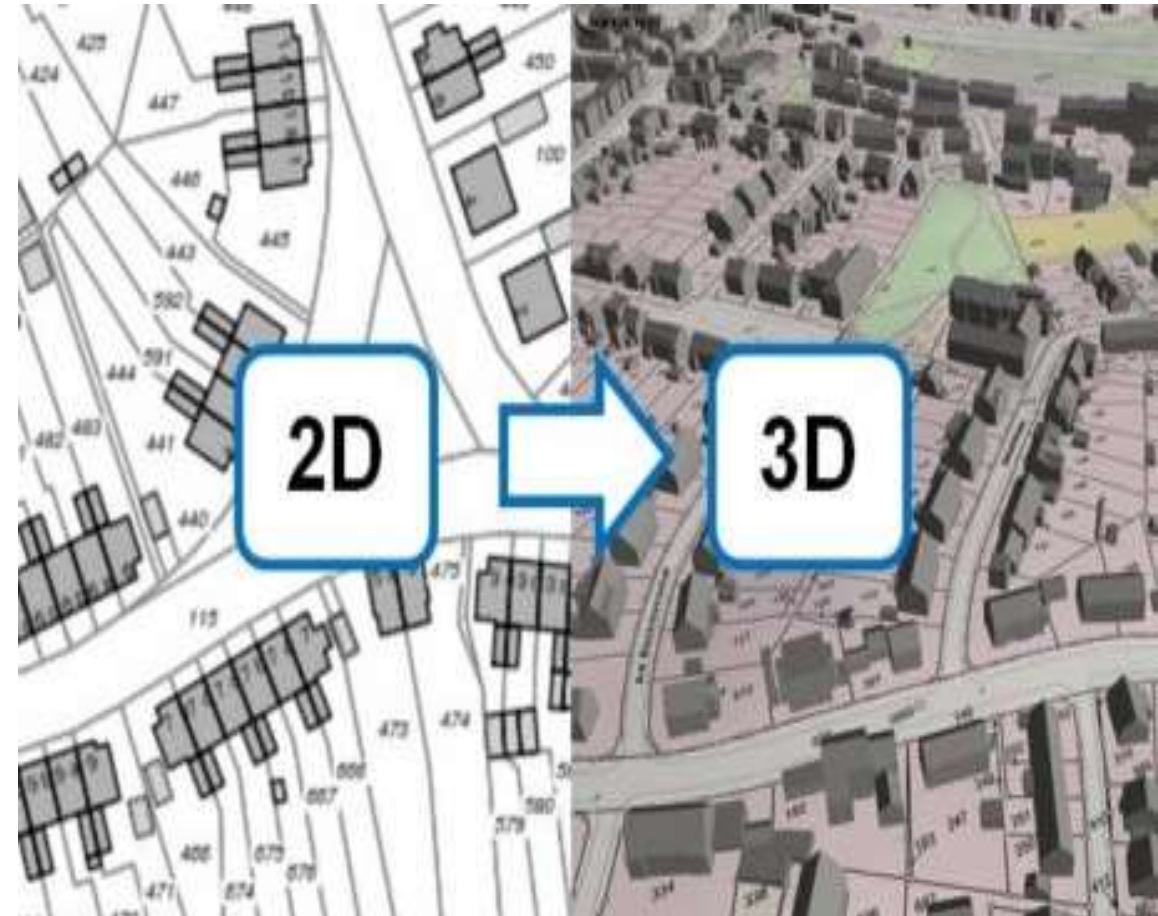
GDLRC, which has realized many projects in line with its duties and social responsibility principle, stands out with the, "3D City Models Production and 3D Cadaster Infrastructure Creation Project ", which is among the first application examples in terms of content. The feature that distinguishes the project from other country examples and makes it stand out is that it works in large areas, and besides the production of photogrammetric city models, both the production of 3D city models from architectural projects and the use of architectural projects as an integrated base.

Since the production of 3D City Models, which are spatial data, includes big data, there is also data mining potential. For this reason, **Data Mining** (DM-Data Mining) and **Business Intelligence** (BI-Business Intelligence), which are sub-branches of **Systems, Applications and Products** (SAP- Systems Application Product), are more prominent. The fact that big data can be used in the field of **Social Engineering** is inevitable because it contains a lot of information. The production of 3D city models depends on **costs, sectors, social areas, data generation, data policies, data security, data strategies**, etc. In this paper, it has been tried to reveal what kind of reflections of these issues might have on the possible socio-economic areas.

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2. 3D CADASTRAL WORKS

The 2D cadastral data no longer meets the three-dimensional requirements. It is necessary to represent the 3D physical world as a 3D geometry of registration records as a 2D condominium. Because today's land management approach necessitates the 3D parcel space approach, not the 2D parcels approach.

3D cadaster; It provides the three-dimensional spatial data required for studies carried out in different areas other than cadaster, such as urban planning, land modeling, engineering projects, tax collection, disaster management, protection of cultural and natural assets, environmental protection, and makes **the theme of smart cities** very easy.

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It has a wide range in which 3D cadastral studies will be used.

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2.1 Pilot project

In Ankara Gölbaşı district, in 2018, in the pilot project area of 50 km2, ground control point, facility, measurement and calculations were made, respectively, and aerial imagery was taken with an oblique camera. The first technical requirements for the, "3D City Models Production and 3D Cadaster Infrastructure Creation Project" were created.

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2.2 Dissemination of pilot project and implementation

- Vector building roof data with stereo digitization at LOD2.3 level
- Point Cloud at 10 cm grid width
- Digital Elevation Model in 10 cm grid width
- Digital Terrain Model in 10 cm grid width
- TrueOrthophoto Map with 10 cm ground resolution
- Textured 3D photogrammetric model at LOD2 level
- Vector building data with manual digitization of architectural projects at LOD2.3 level
- Architectural 3D Model at LOD2.3 level
- **3D CityGML data integrated** with land registry and address data
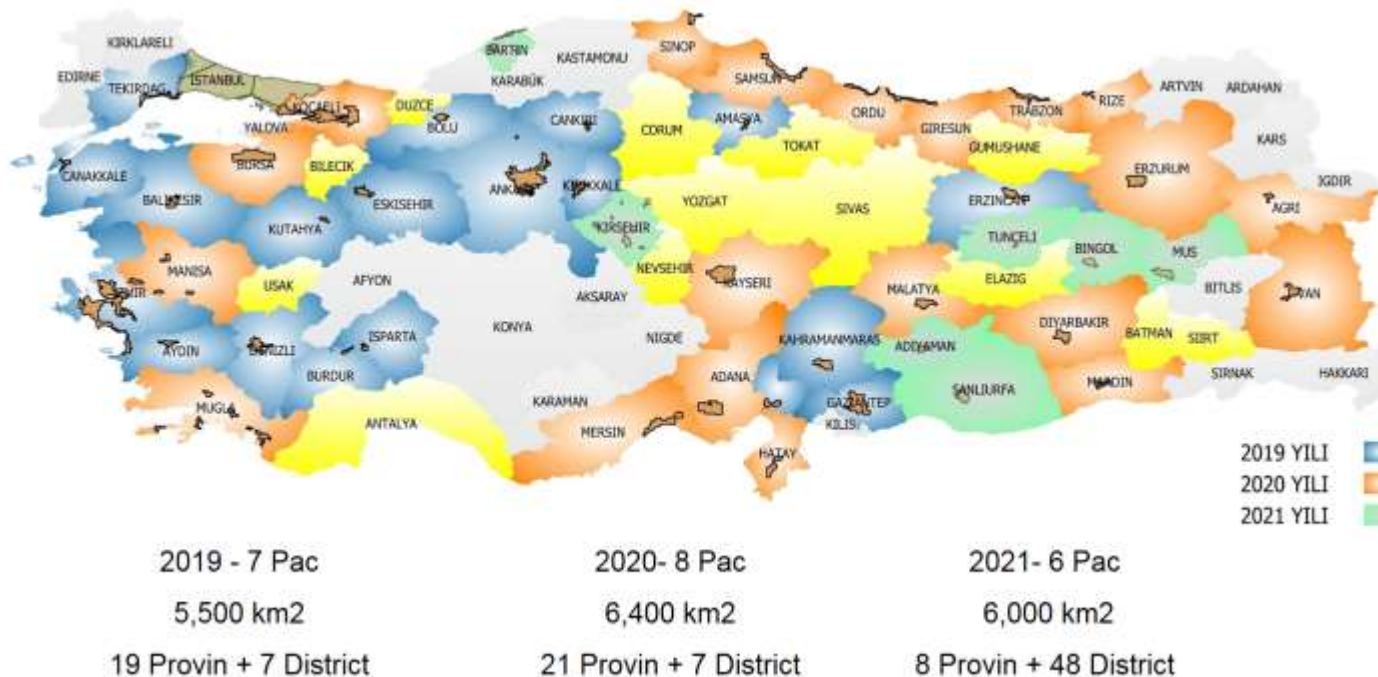
Their production has been carried out since 2019.

2019 - 7 Pac	2020- 8 Pac	2021- 6 Pac
5,500 km2	6,400 km2	6,000 km2
19 Provin + 7 District	21 Provin + 7 District	8 Provin + 48 District

2019 YILI
2020 YILI
2021 YILI

Production is carried out on an annual average of 6000 km2.

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2.3 Amasya pilot application

Within the scope of 3D Cadaster studies, a pilot application was carried out in the province of Amasya, where the production was completed for the first time. In addition to the existing 3D productions in Amasya, the following studies were also carried out and the results were shared as a web presentation.

- Establishment of the National **Digital Building** Model Standard

- Detection and Tracking of Existing **Building Stock**

- Spatial Representation of Public Constraints

- Collection and Valuation of Data Affecting the Value of Real Estate Land Registry

- Cadaster - MAKS - Integration of 3D Building Data

- 3D Presentation of all integrated data Survival of City Models within the Scope of **3D Cadaster**

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2.4 Monitoring of 3D Cadaster Studies

All progress regarding the project was made by the Presidency in the 11th Development Plan, with the main measure 680.

Sub-measures under the main measure regarding urbanization,

"680.1.The spatial sensitivity infrastructure in urban areas, which will be the basis for National Map production works, will be renewed" and "680.2.Multidimensional cadastre/map production will be completed"

monthly, quarterly, semi-annual and annual progress is reported periodically.

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3. SOCIO-ECONOMIC REFLECTIOS

Many innovations have been made from the past to the present on the possibilities of use for immovables and the legislative arrangements regarding ownership. The development and progress of information and technologies has also changed the perspective on immovables and the understanding of immovable use. **Metaverse**, which has developed in the new world order undergoing digital transformation, will be one step closer to the real world and become compatible with the Production of 3D City Models. Considering the limitlessness of human imagination, the production of 3D City Models will make a great contribution to the reality that will be established between the Metaverse and the fantasy world.

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3.1 Social implications
3.1.1. Land genus change

Legislative arrangements have been made in our country regarding the genus change, and the genus change procedures of all buildings, for which occupancy permits have been issued in the past upon the application of individuals, are now carried out **ex officio and free of charge**. The control and confirmation of the data and information about the buildings brings the 3D City Model Production to the fore and reveals its importance. Thanks to the data to be produced; It will reduce the burden of public institutions, private and legal persons and citizens, as well as save **time and costs**. Transactions to be made regarding structures, gains (transition from passive to active), trade (buying/selling), use of credit, etc. will provide conveniences and turn into opportunities. Thus, the sustainability of ongoing or new projects will be ensured. 3D City Model Production data and information will also come to life on **the metaverse platform**, enabling the land registry to meet with the **physical (real) world** and gain meaning.

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3.1.2. Employment

Production of 3D City Model data and information; As it includes different professional disciplines, **new business areas** and **professions** including different fields of expertise will be created and contribute to the improvement and advancement of technology. It will also contribute to the formation and development of the virtual commercial (buying / selling) environment on Metaverse platforms. Today, **NFT, blockchain and holochain technologies** have started to form the current ground of virtual universes. Thus, unemployment, which is one of the biggest problems of today, will decrease and employment will increase.

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3.1.3. Anti-Corruption

In real estate purchases and sales; Since the sales intended to mislead the buyers by the sellers or the purchases aimed at misleading the buyer due to the seller's lack of complete information will be prevented, undesirable purchases and sales will be prevented and a correct **taxation** will be possible. Thus, illegal (illegal) uses, initiatives, purchases and sales will be prevented by the public.

3.1.4. Right to Information

In real estate purchases, more information is needed in terms of visuality and other than location information, and many buyers and sellers are not aware of this. 3D City Model Productions; condominium, floor plans, restrictions, measures, independent sections, etc. In this way, 3D City Model Productions will contribute to the full realization of the information, since **obtaining information is a legal right**.
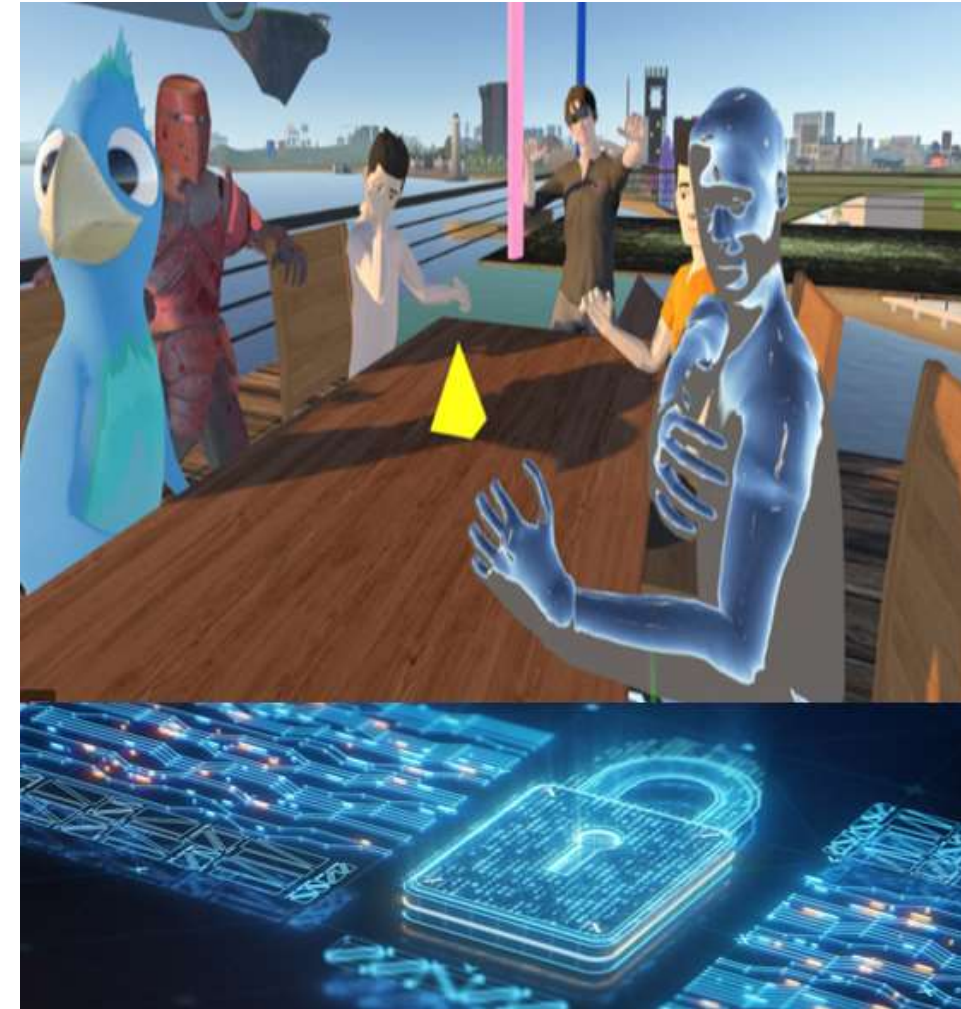
3.1.5. Social Justice

While meeting the needs of each other in the name of socialization, it is important to **protect their legal rights**, in short, to ensure **social justice**. The most fundamental issue for ensuring social justice is property. In addition, today the property has moved to a wider platform with the metaverse. The lack of information has an important place under the main problems on property. Since 3D City Model Productions contain big data and information, condominium ownership will contribute to the reduction of disputes and lawsuits, and with the correct use of individuals' rights and obligations, trust in the state and land registry will increase.

3.1.6. Social Security

The increase in metaverse platforms and the sharing of data and information over the internet paves the way for **social engineering** studies. The increase in social engineering studies brings the security of personal data and information to the fore. Since 3D City Model Productions contain big data and information, it forms a basis for social engineering studies. Although legal solutions are tried to be brought about informatics, sometimes irreversible problems arise. Here, **data and information security, policies and strategies** should be established in order to ensure the social security of public institutions, citizens, private and legal persons. Although 3D City Model Productions may seem like a disadvantage to include big data and information, they offer great opportunities both to inform each individual and to form a basis for data and information security, policies and strategies.

3.1.7 Working environment, meetings and interviews

The private companies; they will manage all office processes, all meetings, customer and company team meetings over **metaverse universes**. Metaverse universes can be used for social activities such as family meetings and important day celebrations. Metaverse universes, which will use 3D city models conjugated with the land registry, will have positive reflections on the production of creative, economic and ecological projects, and **the economic and social transformation** of the real estate marketing world.

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3.2 Economic implications

3.2.1 Change of Use

A change of type means that the type of an immovable property is built when it is unstructured or becomes unstructured when it is built; vineyard, garden, field etc. while on the land; It is the process done in the map and land registry in order to transform the land or land into a vineyard, garden and similar situation. With the 3D cadastre project, since the physical world and land registry records will be the same, **usage changes** that have not been made or not made for years will also be able **to be made automatically**. This will lead to an increase in the rate of purchase/sales (turnover) and the economy to move. At the same time, **tax losses will also be prevented.**

3.2.2 Reference Applications

3D City Models Production and 3D Cadastre Base Creation project also constitutes a reference to other country applications. It is known that some GDLRC contractors are working on the production of 3D city Models in the USA, Germany, Ukraine, Austria and Kosovo, and their activities are closely followed.

3.2.3 Data Sharing

The data produced in the data production processes of 3D cadastral studies are shared with universities to be used in language, master and doctoral studies. GDLRC staff also participate in academic **R&D (Research and Development)** studies and an **academic perspective** is gained. With the data shared with local governments, it is aimed to meet the needs on the one hand, to update the data and to increase the LOD level on the other. Also, studies on **data sharing by using the revenue sharing model** continue.

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3.2.4 Collaborations

In order to develop new value-added products, data is shared not only with universities but with all willing stakeholders, and R&D studies are supported. In data sharing with public institutions and local governments, it is aimed to increase the LOD level of 3D data. Only in 2021, 3D data was shared with more than 10 stakeholders. Thus, it is considered that many PROPTECH applications, including metaverse platforms, can be brought into the economy.

3.2.5 Proptech applications

It is an obvious fact that 3D city models integrated with TAKBIS will start a new era in the Turkish real estate sector and this will **create economic value**. It is thought that it will form a base in applications such as RFID supported rental / sale information, outdoor-indoor travel, BARKOD-based information and outdoor-indoor travel, facet Advertising Applications, roof energy application, apartment or site-based agriculture and similar applications. **Patents, utility models and different platform products** to be developed in this process will contribute positively to the real estate economy.

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3.2.6 Fintech Applications

Considering that Turkish citizens have recently purchased a lot of land from metaverse platforms, it is thought that many **blockchains, NFT crypto money and FINTECH tools** such as NFT will actively take place in the market depending on PROPTECH applications. Carried out in Amasya within the scope of 3D cadastre studies by the General Directorate of Land Registry and Cadastre; Oblique images, real orthophotos, digital terrain models and 3D building structures, as well as 3D representation of duties and obligations, public barrens, that is, the land registry compatible representation of the physical world, aroused great excitement in the sector. It is considered that administrative, technical and legal arrangements in this area should be made first.

3.2.7 Green Economy

In our country in 2021; In addition to the previous actions/activities, the "National Report on the Implementation of the New Urban Agenda" was published, the "Green Reconciliation Action" was put into practice, the "Paris Agreement" was signed and the "COP26 (Conference of the Parties 26) Climate Summit" held in Glasgow, Scotland was attended. Accordingly, in the real estate sector, serious developments are expected that will revive the country's economy in areas such as **green certified** residence, green certified site, green certified housing, **green / ecological value**, balcony agriculture, living room agriculture, lateral surface agriculture, roof solar energy, **zero waste management**.

4. CONCLUSION

3D Cadastre studies in feasibility studies; It is envisaged that the data produced within the scope of the project can be used in at least 200 different areas such as **smart cities, real estate valuation and marketing, urban transformation, city planning, real estate insurance, disaster management, urban energy, urban agriculture, security, 3D game industry and green economy**. In addition, it has been evaluated that this project is one of the important milestones of the **socio-economic development** aimed with the sustainable land management system.

THANK YOU
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