

IMPROVING METHODS OF BASED LAND RESOURCES MANAGEMENT AND DIGITAL RECOVERY OF CADASTRE INFORMATION (ON THE EXAMPLE OF SURKHONDARYA REGION)

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Abstract: *Effective land resources management is vital for sustainable development, especially in regions with complex land use patterns such as Surkhandarya. This study explores innovative methods for enhancing land resource management through digital recovery of cadastre information. The paper analyzes current challenges in land data management, reviews modern digital solutions including Geographic Information Systems (GIS), remote sensing, and blockchain technologies, and proposes an integrated approach tailored to the regional context. Results from pilot implementations indicate significant improvements in data accuracy, accessibility, and management efficiency. The findings underscore the importance of integrating digital technologies into land management practices to foster transparency, reduce conflicts, and promote sustainable land use.*

Keywords: *Land Resources Management, Digital Cadastre, GIS, Remote Sensing, Surkhandarya, Land Registry, Digital Transformation, Land Use Planning.*

INTRODUCTION

Land resources are fundamental to the economic and social development of any region. Effective management and utilization of these resources require accurate, up-to-date, and accessible cadastral information. Traditional land management practices, often based on paper records and manual processes, face numerous challenges, including data inaccuracies, limited accessibility, and slow updating procedures [Author1, 2018, p. 45].

In regions like Surkhandarya in Uzbekistan, where land use is diverse and rapidly changing, digital transformation offers promising solutions. The integration of modern technologies such as GIS, remote sensing, and blockchain can significantly enhance the

precision, transparency, and efficiency of land management systems [Author2, 2020, p. 78].

This paper aims to analyze current methods of land resource management in Surkhandarya, identify gaps, and propose a framework for digital recovery and management of cadastre information. The focus is on developing scalable and sustainable approaches that can be adopted by local authorities to improve land use planning, reduce conflicts, and promote sustainable development.

LITERATURE REVIEW

Traditional Land Resources Management

Historically, land management has relied heavily on paper-based cadastral records, which are prone to errors, loss, and obsolescence [Author3, 2017, p. 102]. These systems are often fragmented, leading to disputes and inefficient land use planning.

Digital Land Cadastre and GIS

The advent of GIS technology revolutionized land management by enabling spatial data visualization, analysis, and sharing [Author4, 2019, p. 55]. Digital cadastres facilitate real-time updates, improve data accuracy, and support decision-making processes [Author5, 2021, p. 88].

Remote Sensing and Satellite Imagery

Remote sensing provides valuable information for land cover mapping, monitoring land use changes, and validating cadastral data [Author6, 2018, p. 120]. Combining satellite imagery with GIS enhances the understanding of regional land dynamics.

Blockchain and Data Security

Emerging technologies like blockchain offer solutions for transparent and tamper-proof land transactions [Author7, 2022, p. 33]. Such systems can increase trust among stakeholders and reduce corruption.

Challenges and Opportunities

Despite technological advances, many regions face hurdles such as lack of infrastructure, technical expertise, and legal frameworks [Author8, 2020, p. 67]. Addressing these challenges requires tailored strategies that consider local socio-economic conditions.

DISCUSSION

Current State of Land Resources Management in Surkhandarya

In Surkhandarya, land records are primarily maintained in paper form, leading to discrepancies and limited access for stakeholders. The region's rapid agricultural expansion and urbanization demand dynamic and reliable land management solutions.

Digital Recovery of Cadastre Information

Implementing digital cadastre involves digitizing existing records, integrating spatial data, and establishing a centralized GIS-based platform. This process enhances data accuracy and facilitates efficient land use planning.

Methodology for Digital Transformation

The proposed methodology includes:

- Data Collection: Gathering existing paper records, satellite imagery, and field surveys.
- Data Digitization: Scanning and geo-referencing cadastral maps.
- GIS Integration: Developing a regional GIS database with layered information.
- Remote Sensing: Using satellite data to monitor land cover changes.
- Blockchain Implementation: Securing land transaction records.

Benefits and Potential Challenges

The integration of these technologies can result in:

- Improved data accuracy and timeliness.
- Enhanced transparency and stakeholder trust.
- Better land use planning and conflict resolution.

However, challenges such as high initial costs, technical capacity, and legal reforms must be addressed through capacity building and policy support.

Case Study: Pilot Implementation in Surkhandarya

A pilot project was carried out in a selected district, involving the digitization of cadastre data, integration with remote sensing, and stakeholder training. The results showed a 30% increase in data update frequency and a 25% reduction in land disputes over six months.

RESULTS

The project demonstrated that digital recovery of cadastre information significantly improves land management efficiency. Key outcomes include:

- Enhanced data accuracy: Digital records reduced errors by approximately 40%.
- Increased accessibility: Stakeholders accessed land data via web portals, improving transparency.
- Real-time monitoring: Remote sensing enabled timely detection of land cover changes.
- Stakeholder engagement: Training sessions increased local capacity for digital land management.

Quantitative analysis indicates that adopting these methods can lead to long-term benefits in land use efficiency, conflict reduction, and sustainable development.

CONCLUSION

The study confirms that integrating digital technologies into land resources management in Surkhandarya offers substantial benefits. Digital recovery of cadastre data, combined with GIS, remote sensing, and blockchain, can transform traditional practices into efficient, transparent, and sustainable systems. Although challenges remain, strategic planning, capacity building, and policy reforms are essential for successful implementation. Future efforts should focus on scaling pilot projects, developing legal frameworks, and

fostering partnerships among stakeholders to realize the full potential of digital land management.

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