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Effective idle land management: a conceptual framework from land management paradigm

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Abstract. Land serves as a fundamental input for social and economic sectors, significantly influencing the achievement of the Sustainable Development Goals (SDGs). However, idle land can impede progress toward these goals if not utilized effectively. The prevalence of idle land has expanded in rural and rapidly growing urban areas across countries at different stages of development. Although several idle land management approaches have been implemented, they often result in short-term fixes rather than long-term solutions, and their efficacy remains inconsistent. Therefore, this article proposes a conceptual framework rooted in the principles of the Land Management Paradigm. This framework is developed based on a broad literature review to provide insights into the determinants for effective idle land management. The framework development draws upon the Land Management Paradigm, which highlights the interrelationship among a country's land policy framework, land administration functions, land information infrastructures, and institutional arrangements. By utilizing this paradigm, the determinants for effective idle land management can be investigated comprehensively. The proposed conceptual framework highlights the importance of an integrated approach to idle land management. It emphasizes the need for a robust land policy framework that facilitates effective land utilization and discourages land idling. Furthermore, efficient land administration functions are vital in regulating and managing idle land. Accurate and accessible land information infrastructures are essential for informed decision-making and promoting optimal land use. Lastly, appropriate institutional arrangements must be established to ensure coordination and collaboration among relevant stakeholders involved in idle land management. In conclusion, idle land poses significant challenges to sustainable development, and existing solutions have often focused on short-term fixes. This article proposes a conceptual framework that integrates the principles of the Land Management Paradigm to enhance the effectiveness of idle land management initiatives towards implementing long-term solutions that promote optimal land utilization, contributing to achieving the SDGs.

1. Introduction

Land plays a vital role in social and economic sectors, significantly impacting the achievement of the Sustainable Development Goals (SDGs). However, unused land can hinder progress toward these goals if not managed effectively. There is a growing amount of unused land in rural and rapidly growing urban areas across countries at different development stages [1]. Although various approaches to managing unused land have been tried, they often lead to short-term fixes rather than long-lasting solutions with inconsistent effectiveness [2].



The inefficient management of idle land presents a significant obstacle to achieving these critical objectives. Idle land refers to areas, spaces or buildings not being used or underused due to reasons like unclear land ownership, disputes over land rights, financial limitations, or lack of access to technology and knowledge [3][4][5]. When land remains idle, it represents a missed opportunity for productive activities and exacerbates issues related to land scarcity, food insecurity, and inadequate housing, which can impede socio-economic development [6].

This framework is developed based on a broad literature review to provide insights into the determinants for effective idle land management. By reviewing relevant data from existing sources, the study aims to comprehensively understand the key factors influencing idle land management, focusing on promoting sustainable and optimal land utilization practices.

Both rural and urban areas are affected by the problem of idle land. In rural areas, factors such as land fragmentation, unclear land rights, and migration to cities contribute to the expansion of idle land [5][7]. In urban settings, rapid urbanization leads to vacant lots, abandoned industrial sites, and underdeveloped urban peripheries, all contributing to the growing pool of idle land in cities [3].

Various strategies have been implemented to address the issue of idle land, but they have yet to yield satisfactory results consistently. Often, these approaches focus on short-term solutions, such as temporary land use interventions or ad hoc programs to address immediate socio-economic challenges. While these measures may provide some relief, they need to offer sustainable, long-term solutions to the underlying issues of idle land. In some cases, these short-term fixes may worsen the problem by encouraging landowners to continue holding onto their unused land in the hope of future gains or increasing land values [2].

In conclusion, unused land poses a significant challenge to achieving Sustainable Development Goals and sustainable development. The widespread nature of this issue across rural and urban areas in countries at different development stages highlights the need for effective and lasting solutions. Short-term fixes have proven insufficient in fully addressing the complexities of idle land, necessitating a more comprehensive and integrated approach that considers the various factors influencing land use decisions[2].

2. Effective land management characteristics

As previously stated, idle land, often characterized by its unproductive or underutilized state, represents a considerable resource that has the potential to contribute significantly to socioeconomic development and environmental conservation. However, harnessing its latent potential necessitates a systematic and strategic approach to land management. A comprehensive review of the current literature on land management serves as a crucial stepping stone in this endeavor, as it elucidates the multifaceted challenges, opportunities, and best practices identified by scholars and practitioners alike.

To effectively address the complexities of idle land management, it is essential to discern the characteristics that define successful land management initiatives. Reviewing existing literature helps identify common traits, patterns, and principles that have yielded positive outcomes in diverse contexts. A nuanced understanding of the components that lead to fruitful land management outcomes can be developed by drawing upon the knowledge amassed through rigorous research and practical experiences [8].

The literature on land management comprises many case studies, empirical analyses, and comparative evaluations that showcase exemplary success stories and instances of less successful implementations. The criticality of understanding the characteristics of effective land management must be considered when optimizing idle land utilization. A thorough review of current literature is a foundational step in comprehending the nuances of idle land management, offering valuable insights into successful strategies, best practices, and lessons learned from past endeavors.

In this context, the land management paradigm, a well-established conceptual framework encompassing crucial elements of land management, provides a structured approach to organizing and analyzing insights derived from existing literature on effective land management. This scholarly

discourse advocates adopting the paradigm as a fundamental organizing tool, aiming to elucidate the interplay between various elements of land management and enhance decision-making processes [8].

The land management paradigm encompasses four key elements: land administration functions, land policy framework, land information infrastructures, and institutional arrangements (as shown in Figure 1). Each element plays a distinct role in shaping land management practices and collectively forms a cohesive and comprehensive framework that encapsulates the complexities of effective land management. By sorting relevant literature according to these elements, researchers gain a panoramic view of the multifaceted dimensions contributing to effective land management.

Therefore, effective land management characteristics can be categorized according to the four elements of the land management paradigm: land administration functions, land policy framework, land information infrastructures, and institutional arrangements.

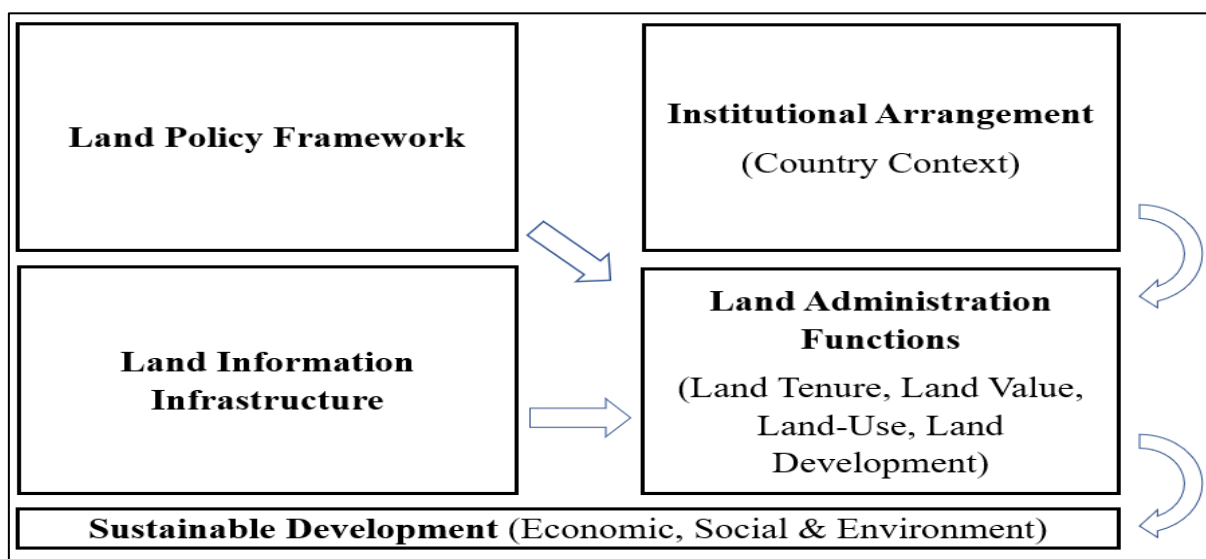


Figure 1. Land Management Paradigm [8]

Each element represents an essential aspect of land management that, when integrated harmoniously, contributes to successful land governance. By exploring and sorting these characteristics within the land management paradigm (as shown in Table 1 below), policymakers and stakeholders can gain valuable insights into building comprehensive and efficient land management systems, promoting responsible land use, addressing land-related challenges, and fostering socio-economic development while safeguarding environmental integrity [8].

2.1. *Efficient land administration functions for regulating land*

Land administration functions are the backbone of effective land management, serving as a crucial framework for promoting sustainable development and resource optimization. Implementing efficient land registration and titling systems is at the forefront of these functions. By establishing secure ownership rights, such systems instill confidence in investors and reduce legal uncertainties, encouraging economic growth and development [9]. Furthermore, streamlined land transfer and transaction processes reduce bureaucratic delays and transaction costs, making it easier for individuals and businesses to invest in land and promote efficient land markets [8].

Robust land survey and mapping activities provide accurate and up-to-date geospatial data for informed decision-making. These data assist in identifying potential development areas, monitoring land-use changes, and assessing environmental impacts, enabling policymakers to plan and manage land resources effectively [10]. Effective land-use planning and zoning regulations are equally essential to ensure optimal land utilization and minimize conflicting land uses. These regulations foster organized

and sustainable development by designating specific areas for various purposes, such as residential, commercial, and agricultural [11].

Table 1. Effective land management characteristics from literature reviews

Effective Land Management Characteristics	Author
Land Administration Functions:	
-Efficient land registration and titling systems	[9]
-Streamlined land transfer and transaction processes	[8]
-Robust land survey and mapping activities	[10]
-Effective land-use planning and zoning regulations	[11]
-Mechanisms to prevent and manage land disputes and conflicts	[12]
-Regular monitoring and enforcement of land use regulations	[6][13]
-Transparent land valuation and taxation systems	[8]
-Mechanisms to promote land development and infrastructure provision	[13]
-Encourages sustainable agricultural and forestry practices	[10]
Land Policy Framework:	
-Clear objectives aligned with sustainable development goals	[6]
-Comprehensive and inclusive stakeholder engagement	[8]
-Transparent and accountable governance mechanisms	[14]
-Long-term vision and adaptability to changing circumstances	[10]
-Flexible regulations that balance economic, social, and environmental considerations	[15]
-Encourages land consolidation and discourages land fragmentation	[16]
-Incorporates mechanisms to address land tenure security and equity	[10]
-Encourages responsible land use practices	[12]
-Facilitates access to land for marginalized and vulnerable groups	[12]
-Promotes land valuation mechanisms that reflect market realities and social values	[15]
Land Information Infrastructures	
-Comprehensive land databases and information systems	[17]
-Accurate and up-to-date geospatial data	[10]
-Open access to land information for stakeholders	[17]
-User-friendly interfaces and tools for data visualization and analysis	[17]
-Integration of land-related information with other relevant datasets	[17]
-Reliable and accessible mechanisms for data sharing and collaboration	[12]
-Regular updating and maintenance of land information systems	[10]
-Mechanisms to ensure data privacy and security	[10]
-Standardization of data formats and metadata	[17]
-Training and capacity building for users of land information systems	[18]
Institutional Arrangements	
-Coordinated and collaborative governance structures	[19]
-Clearly defined roles and responsibilities of land management institutions	[20]
-Effective interagency coordination and communication	[10]
-Engages and involves all relevant stakeholders	[12]
-Mechanisms for public participation and consultation	[21]
-Adaptive management approaches to respond to changing needs	[22]
-Adequate human and financial resources for land management	[23]
-Continuous monitoring and evaluation of land management initiatives	[24]
-Knowledge sharing platforms and networks for learning and best practices exchange	[25]

Land disputes and conflicts are common challenges in land management, and mechanisms to prevent and manage such disputes are essential for social stability and economic growth. By establishing dispute resolution mechanisms and providing fair and transparent processes, conflicts can be resolved more efficiently, fostering a conducive environment for land development [12]. Regularly monitoring and enforcing land use regulations are essential to ensure compliance with land management policies and regulations. Through continuous monitoring, policymakers can identify and address violations, preventing unauthorized land use and safeguarding natural resources [6][13].

Transparent land valuation and taxation systems are fundamental for creating a fair and equitable environment for landowners and taxpayers. By ensuring that land valuation is based on market realities and social values, these systems promote responsible land use and generate revenue for public services [8].

Mechanisms to promote land development and infrastructure provision support economic growth and meet societal demands. These mechanisms incentivize land development and infrastructure projects, which, in turn, contribute to urbanization and social progress [13]. Moreover, encouraging sustainable agricultural and forestry practices is vital for environmental preservation and resource sustainability. Land management can balance economic growth with ecological conservation by promoting sustainable land-use practices, such as agroforestry and sustainable farming methods [10].

To conclude this section, the literature identifies that successfully implementing land administration functions is critical for sustainable land management. From efficient land registration and titling systems to transparent land valuation mechanisms and sustainable land-use practices, each function fosters economic growth, social welfare, and environmental protection. By embracing these functions within the broader context of land management, policymakers can pave the way for a prosperous and sustainable future by prioritizing responsible land use and resource optimization.

2.2. The role of a robust land policy framework

The land policy framework is crucial for establishing sustainable land management practices, ensuring that land resources are utilized responsibly to achieve long-term socioeconomic and environmental goals. Clear objectives with sustainable development goals offer an overall framework for land management initiatives, guiding decision-makers toward an appropriate economic growth and environmental preservation equilibrium [6]. Furthermore, combining multiple stakeholders, such as local communities, corporations, and environmental groups, ensures that policies present the desires and requirements of all segments of society [8].

Transparent and accountable governance mechanisms are essential to build public trust and confidence in land management institutions. By adhering to principles of transparency and disclosing relevant information, policymakers can foster accountability and minimize corruption risks [14]. A long-term vision and adaptability to changing circumstances are crucial to ensure land policies remain relevant and effective in a dynamic world. Policymakers must anticipate and respond proactively to emerging challenges, safeguarding the sustainability of land resources for future generations [10].

The land policy framework incorporates flexible regulations that carefully balance economic, social, and environmental considerations. Striking this delicate balance ensures that land management practices promote economic growth while safeguarding social welfare and environmental sustainability [15]. Moreover, the framework encourages land consolidation and discourages land fragmentation, optimizing land use, enhancing agricultural productivity, and curtailing environmental degradation caused by excessive land parceling [16].

Addressing land tenure security and equity is an integral aspect of an equitable land policy framework. By ensuring secure land tenure rights, policymakers can foster social stability, reduce inequality, and promote long-term investments in land [10]. Encouraging responsible land use practices is equally significant for ecological preservation. Sustainable approaches to land management promote sustainable development by conserving ecosystems and protecting natural resources [12].

An inclusive land policy framework must simplify access to land for underprivileged and vulnerable populations. By providing equitable access to land, policymakers can empower marginalized communities economically and socially, fostering poverty reduction and social inclusion [12]. Furthermore, the framework promotes land valuation mechanisms that reflect market realities and social value, ensuring fair and accurate land pricing. A comprehensive valuation system considers market trends and societal considerations, preventing land speculation and promoting equitable land distribution [15].

This section has briefly summarized the literature about a well-crafted land policy framework is essential for steering societies toward sustainable land management practices. By embracing different groups of stakeholders, promoting transparency and accountability, and advocating responsible land use practices, policymakers can put together a robust and equitable framework. This framework enables preserving the environment, social well-being, and economic growth, paving the path for a sustainable and prosperous future. The likelihood of establishing a balanced and harmonious interaction between land resources and people becomes possible using a thorough study of these features and their incorporation into land management plans.

2.3. The significance of accurate land information infrastructures

Land information infrastructures form the backbone of effective land management, providing essential tools and systems for informed decision-making and sustainable resource utilization. These infrastructures' core are comprehensive land databases and information systems, which consolidate a vast array of land-related data, ranging from ownership records to environmental assessments. This wealth of data empowers policymakers to gain a holistic view of land resources and their potential uses, facilitating evidence-based policy formulation and resource planning [17].

Geospatial data accuracy and timeliness are vital for effective land management. Policymakers may precisely determine possible development sites, monitor land-use changes, and evaluate the environmental impact by providing reliable and up-to-date geospatial information. Geospatial data are invaluable in optimizing land use, minimizing conflicts, and ensuring ecological preservation [10].

Open access to land information for stakeholders promotes transparency, inclusivity, and collaboration in land management. By providing public access to land data, including citizens, businesses, researchers, and non-governmental organizations, decision-making becomes more participatory and accountable. Open access invites diverse perspectives and fosters public trust in land management processes [17].

User-friendly interfaces and data visualization and analysis tools are vital for effectively utilizing land information systems. These interfaces simplify interpreting complex data, making it accessible to policymakers and stakeholders. Such user-friendly tools enhance the efficiency and effectiveness of decision-making processes, facilitating swift responses to emerging challenges [17].

Integrating land-related information with other relevant datasets enriches the comprehensiveness and utility of land information systems. By connecting land data with other critical datasets, such as infrastructure maps and demographic statistics, policymakers gain a broader perspective on the implications of land-related decisions in various sectors. This integration supports more cohesive and informed policy development [17].

Reliable and accessible data sharing and collaboration mechanisms are pivotal for interagency cooperation and evidence-based policy formulation. Streamlining data sharing between different land management institutions avoids duplication of efforts and promotes integrating diverse perspectives, leading to more comprehensive land management practices [12].

Regularly updating and maintaining land information systems is essential for preserving data accuracy and relevance. By continuously updating land data, policymakers can rely on current and reliable information for decision-making, avoiding the pitfalls of outdated data. Regular maintenance ensures that the systems function optimally, preventing potential disruptions in data accessibility [10].

Mechanisms to ensure data privacy and security safeguard sensitive land information from unauthorized access, reinforcing public trust and confidence in land management institutions. Protecting

the privacy and security of land data is paramount in the digital age, and robust measures are necessary to mitigate potential risks [10].

Standardization of data formats and metadata is essential for seamless data exchange and compatibility between different land information systems. Land management institutions can integrate information efficiently by adopting standardized data formats, enhancing overall data management practices and promoting interoperability [17].

Training and capacity building for users of land information systems is instrumental in optimizing data utilization and efficiency. By providing stakeholders with adequate training, policymakers can empower them to harness the full potential of land information systems, ensuring more effective and informed decision-making [18].

In summary, it has been shown from this review that land information infrastructures are a bedrock for sustainable land management, enabling policymakers to make informed decisions, promote transparency, and collaborate effectively. Each characteristic contributes to the success of land information systems, from comprehensive land databases and accurate geospatial data to user-friendly interfaces and data privacy measures. By embracing and integrating these characteristics, policymakers can unlock the true potential of land resources, fostering socio-economic development, environmental preservation, and overall prosperity. The seamless flow of information facilitated by these infrastructures empowers societies to navigate the complexities of land management and steer toward a sustainable and prosperous future.

2.4. Establishing appropriate institutional arrangements

Institutional arrangements play a pivotal role in shaping the effectiveness and success of land management initiatives, providing the necessary framework for coordinated and collaborative governance. Coordinated and collaborative governance structures foster interagency cooperation and streamlined decision-making processes. Policymakers can enhance policy coherence and optimize resource allocation by establishing communication and information exchange mechanisms [19].

Central to adequate institutional arrangements is the precise definition of the roles and responsibilities of land management institutions. This ensures that each entity operates with clarity and purpose, minimizing overlaps and enhancing efficiency. When roles are clearly defined, allocating resources effectively and holding institutions accountable for their actions becomes easier [20].

Effective interagency coordination and communication are essential to address land management's complex and interconnected challenges. By fostering communication channels and cooperation between various land management institutions, policymakers can take a holistic approach to addressing multifaceted land-related issues [10].

Engaging and involving all relevant stakeholders is a critical characteristic of successful institutional arrangements. Policymakers can consider various perspectives by involving diverse groups, including local communities, indigenous peoples, businesses, and environmental organizations. This inclusivity fosters greater acceptance and legitimacy of land management initiatives [12].

Mechanisms for public participation and consultation empower citizens to influence land governance decisions. Policymakers demonstrate their commitment to inclusive decision-making and transparency by providing public input and feedback opportunities [21].

Adaptive management approaches are vital to respond to changing needs and dynamic environments. Embracing adaptive management principles allows policymakers to adjust strategies and policies as circumstances evolve, ensuring land management initiatives' continued relevance and effectiveness [22].

Adequate allocation of human and financial resources is fundamental for effective land management. By ensuring sufficient resources, policymakers can implement and enforce land policies effectively, ensuring the achievement of land management objectives [23].

Continuous monitoring and evaluation of land management initiatives enable policymakers to identify strengths and weaknesses. Regular evaluations provide valuable insights into the effectiveness of policies and help identify areas for improvement and refinement [24]. Knowledge-sharing platforms and networks facilitate learning and best practices exchange. By creating platforms for sharing

knowledge and experiences, policymakers can draw upon successful land management practices worldwide, fostering continuous improvement and enhancing land governance [25].

This section has shown that institutional arrangements are integral to effective land management, providing the necessary structure and mechanisms for coordinated governance, stakeholder engagement, and adaptive management. Policymakers can create a robust and dynamic institutional framework by incorporating clear roles and responsibilities, fostering interagency coordination, involving diverse stakeholders, and embracing transparency and knowledge sharing. This framework supports evidence-based decision-making, transparency, and accountability, steering land management practices toward sustainable development and the harmonious coexistence of human needs and environmental conservation. The seamless continuity and collaboration among stakeholders are critical in achieving a balanced land management approach that respects ecological boundaries while advancing societal progress. Land management can become a powerful tool in shaping a prosperous and sustainable future for future generations through carefully considering and integrating these characteristics.

3. The proposed conceptual framework

As explained in the introduction, it is clear that this article proposes a comprehensive conceptual framework rooted in the principles of the land management paradigm, aiming to gain insights into effective idle land management. As shown in Figure 1 above, the land management paradigm is a foundation for understanding the interrelated aspects of land administration functions, land policy framework, land information infrastructures, and institutional arrangements within a country toward sustainable development [8]. This paradigm allows us to explore and analyze the determinants contributing to successful idle land management. This conceptual framework underscores the significance of an integrated approach towards idle land management and advocates for a robust land policy framework, efficient land administration functions, accurate land information infrastructures, and appropriate institutional arrangements to facilitate coordinated and effective management of idle land. Notably, the paradigm provides a framework to facilitate integrating new needs (effective idle land management) into traditionally organized systems without disturbing the fundamental security these systems provide [10].

The land management paradigm is a guiding framework for understanding the intricate dynamics of land management within a country. It emphasizes the interconnection between various elements, such as land administration functions, land policy framework, land information infrastructures, and institutional arrangements. By adopting this holistic perspective, we understand how these components interact and influence each other in idle land management.

In essence, the ultimate measure of idle land management effectiveness lies in the successful realization of idle land redevelopment/rehabilitation projects. These endeavors encapsulate the pinnacle of idle land management, epitomizing the capacity to address multiple challenges through a single activity [26]. In addition, the realization of idle land redevelopment/rehabilitation projects can synergistically tackle various issues and attain tangible progress while aligning with the principles of sustainable development through integrated land management that harmonizes environmental stewardship, societal well-being, and economic prosperity [27].

Therefore, an integrated approach is vital when dealing with the complexities of idle land management. It recognizes that addressing the issue of idle land requires a multifaceted strategy that involves synergistic efforts across various sectors [28]. As shown in Figure 2 above, the proposed conceptual framework emphasizes the integration of land policy, land administration, and land information systems to create a cohesive and effective idle land management system. This approach ensures policies and administrative practices align to optimize land utilization and discourage land idling.

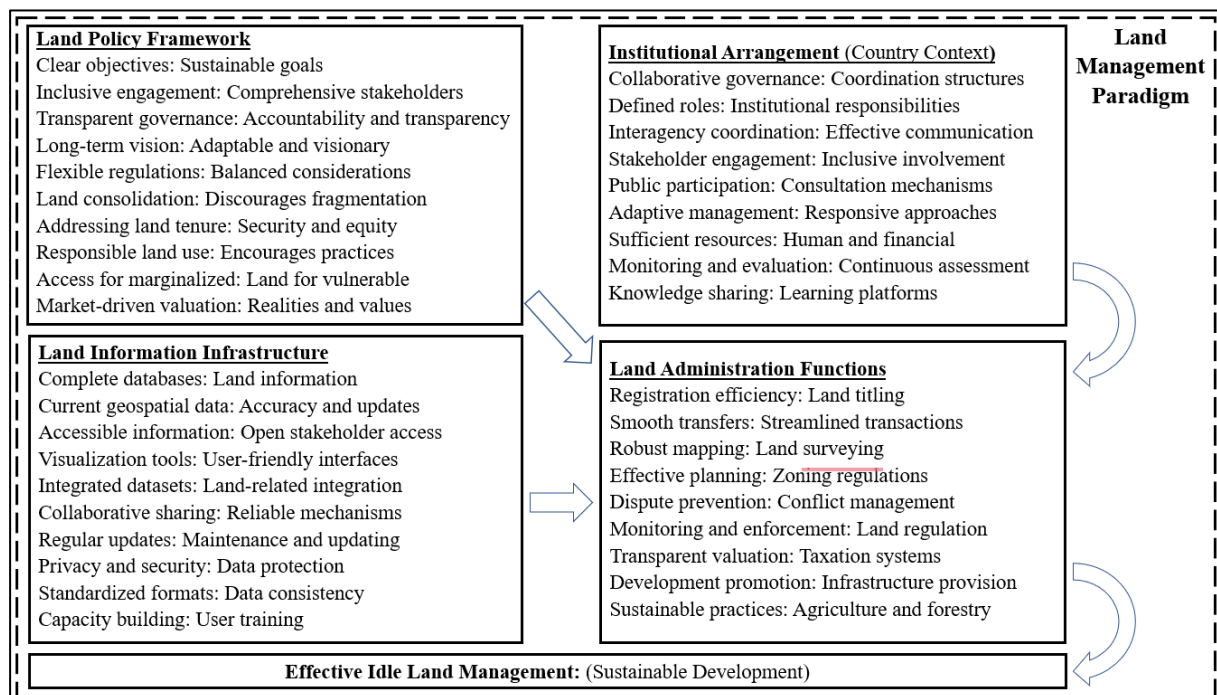


Figure 2. The proposed conceptual framework

Efficient land administration functions are pivotal in regulating and managing idle land. Land administration ensures the proper recording of land rights, transactions, and ownership, promoting transparency and accountability in land management. Governments can effectively identify idle land parcels, monitor land use changes, and enforce land utilization regulations by having a well-functioning land administration system. Such mechanisms deter land idling and encourage responsible land management practices.

A robust land policy framework is the cornerstone of effective idle land management. Such a framework establishes clear guidelines and principles that govern land use, including measures to prevent land idling and promote productive land utilization. It addresses land tenure, rights, and redistribution, which are crucial in encouraging landholders to use their land for practical use. A well-defined land policy framework provides a sense of security and incentivizes landholders to invest in land development, thus minimizing the prevalence of idle land.

Accurate and accessible land information infrastructures are indispensable for informed decision-making in idle land management. Land information systems provide data on land ownership, land use patterns, and land values, facilitating evidence-based policymaking and resource allocation. With comprehensive and reliable land information, authorities can identify underutilized land areas, assess their potential, and devise targeted interventions to put these lands to productive use. This reduces idle land and contributes to the region's overall socio-economic development.

Appropriate institutional arrangements are essential to ensure coordination and collaboration among relevant stakeholders involved in idle land management. A coherent institutional setup brings together government agencies, local authorities, private sector entities, and community representatives to address idle land challenges collectively. Effective collaboration allows for pooling resources, expertise, and knowledge, enabling a more holistic and well-coordinated approach to managing idle land. Furthermore, institutional arrangements facilitate the dissemination of information, implementing policies, and enforcing regulations related to idle land.

4. Conclusion

In summary, the proposed conceptual framework, incorporating the Land Management Paradigm, provides a holistic approach to address challenges related to idle land. It comprises essential components, including land administration functions, land policy framework, land information infrastructures, and institutional arrangements. The framework emphasizes long-term solutions and optimal land utilization, aligning with the Sustainable Development Goals (SDGs). By implementing this approach, countries can unlock the potential of idle land, address socio-economic challenges, and pave the way for a sustainable and prosperous future. The Land Management Paradigm offers valuable insights into effective idle land management, guiding policymakers and stakeholders in making informed decisions to optimize land use and achieve SDGs.

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