MEASURING THE IMPACT OF LAND USE REGULATION ON THE LAND MARKET IN NEPAL

A Thesis Submitted by

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ABSTRACT

Effective land use management and efficient land markets form the basis of sustainable development. The sustainable development of land resources requires consideration across the economic, social, environmental and institutional dimensions. Therefore, measuring the impact of land use regulation on the land market across multiple dimensions can facilitate better decision making and support sustainable land management. Recent developments in land administration system theory indicate the need to undertake the measurement and management of change produced by policy interventions to ensure good governance. However, identifying the aspects of change to be measured across these dimensions and the methods to be adopted for measuring the impact of land use regulation on the land market requires an understanding of the theoretical, conceptual and methodological dimensions.

The aim of this study is to utilise an integrated approach to identify the impact of land use regulation on the land market in Nepal across the economic, social, environmental and institutional dimensions. Nepal has introduced a series of land use policy interventions in recent years and was therefore selected as the study area to understand the impact of land use regulation on its land market. A holistic approach for assessing the impact of land use regulation on the land market was developed in this study as no single theory was found that considered all dimensions appropriately. Fourteen land market impact factors were identified through a desktop review, and these were later refined through semi-structured interviews to adjust the factors to the local Nepalese context. A mixed-method exploratory design framework was adopted to measure the impact of land use regulation on the land market. In the first phase, a qualitative analysis of interview-based data was performed to finalise impact factors relevant to the Nepalese land market, which were then utilised to collect survey-based quantitative data. Quantitative analysis of the survey data was performed using an analytic hierarchy process (AHP); then in the second phase, quantitative research was conducted using archival and documentary evidence. The approach allowed the use of multi-stakeholder and multi-criteria-based assessment of the impact of land use regulation on the land market in Nepal.

The perspective-based findings of the first phase of the research identified negative impacts across the economic, social, and institutional dimensions and a slightly positive impact across the environmental dimension. Across the economic dimension, reductions in subdivisions decreased land supply, increased the price of available residential land, caused a reduction in mortgage availability and increased the overall cost of land transactions. Within the social dimension there was evidence of increased conflicts between buyers and sellers due to the poor implementation of the restrictions and people utilised loopholes such as family separations as a process to subdivide the land. Many of the social impacts were the result of poor communication and implementation of the policy changes by the implementing authorities. The lack of coordination and sharing of land use data across the various implementing institutions further contributed to the negative impact experienced by stakeholders in the land market. Improved planning and land use restrictions had a positive impact due to quality of land developments, reduced congestion, reduced land-owner exposure to flooding and improved open space in land developments. The evidence-based findings of the second phase of the results complemented the findings of the first stage across all dimensions by providing additional insights across each dimension.

The research concluded that the land market could be successfully assessed holistically across the economic, social, environmental and institutional dimensions. In a broader context, the blending of perspective-based findings with evidence-based results in this research improved the breadth of understanding of the impacts across the land market. The research supported the concept that land use regulation and the land market are intrinsically linked and should be considered together to better understand the impact on sustainable development. This mixed methods research approach enabled the measurement of the impact of land use regulation on the land market in Nepal and can contribute to improvements in future land use policy interventions and implementation.

CERTIFICATION OF THESIS

This Thesis is entirely the work of Nab Raj Subedi except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Elements of this work were presented at the "International Workshop on Capacity Building and Education Outreach in Advanced Geospatial Technologies and Land Management", held on 10-12 December 2019, in Kathmandu, Nepal.

Professor Kevin McDougall, Principal Supervisor

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LIST OF ACRONYMS

AHP	Analytic Hierarchy Process
BFI	Bank and Financial Institutions
BPC	Butwal Power Company
CAAN	Civil Aviation Authority of Nepal
CBS	Central Bureau of Statistics
CIAA	Commission for the Investigation of Abuse of Authority
CIB	Credit Information Bureau
CLPP	Chamati Land Pooling Project (KVLPP)
CSD	Cadastral Survey Division
CSO	Chief Survey Officer
DNPWC	Department of National Parks and Wildlife Conservation
DOLIA	Department of Land Information and Archive
DOLMA	Department of Land Management and Archive
DOLRM	Department of Land Reform and Management
DUDBC	Department of Urban Development and Building Construction
DWIDP	Department of Water Induced Disaster Prevention
EU	European Union
FMV	Fair Market Value
FRB	Federal Reserve Bank
GIID	Geographic Information Infrastructure Division
GLDP	Guided Land Development Program
GON	Government of Nepal
HMG	His Majesty's Government of Nepal
HPCIDBC	High-Powered Committee for Integrated Development of the Bagmati Civilisation
HPO	Hydropower Organisation
ICT	Information and Communications Technology
IPPAN	Independent Power Producers' Association of Nepal
KVLPP	Kathmandu Valley Land Pooling Project
KVDA	Kathmandu Valley Development Authority
LGO	Local Government Office
LIS	Land Information System
LLE	Local Land Experts
LMTC	Land Management Training Centre
LPP	Land Pooling Project
LRF	Land Rights Forum

LRO	Land Revenue Office
LSMC	Lalitpur Sub-Metropolis Corporation
LTV	Loan-to-Value Ratio
MCDM	Multicriteria Decision Making
MCE	Micro-Credit Enterprise (Cooperatives)
MDG	Millennium Development Goals
MOLMCPA	Ministry of Land Management, Cooperatives and Poverty Alleviation
MOLRM	Ministry of Land Reform and Management
MOUD	Ministry of Urban Development
NLHDA	Nepal Land and Housing Developers' Association
NICS	Nepal Institution of Chartered Surveyors
NLUMTC	National Land Use Mapping Technical Committee
NPL	Non-Performing Loan
NRs	Nepalese Rupee of Currency
NRA	National Reconstruction Authority
NRB	Nepal Rastra Bank
NSA	Nepal Surveyor's Association
PBLIS	Parcel-Based Land Information System
PLDO	Private Land Developers' Organisation
PLLAN	Professional Legal Lekhapadhi Association of Nepal (Notary Association of Nepal)
REAAN	Real Estate Agent Association Nepal
RLAS	Responsible Land Administration System
RSLUP	Risk Sensitive Land Use Plan
RZEP	Road Zone Expansion Plan
SD	Survey Department
SH	Sanima Hydropower
SO	Survey Office
SDG	Sustainable Development Goals
SDI	Spatial Data Infrastructure
SEC	Surveying and Engineering Consultancies
TDC	Town Development Committee
TLVC	Threshold Land Valuation Committee
TSLUMD	Topographic Survey and Land Use Management Division
UNECE	United Nations Economic Commission for Europe
UNFPA	United Nations Population Fund

Chapter 1: Introduction

1.1. Background to Research

In modern economies, most of the goods and services consumed are acquired through a market. Land markets represent a subset of the broader market and provide a mechanism for people and businesses to access land. Land markets enable a process whereby rights in land and housing are voluntarily traded through transactions such as sales and leases (Palmer et al., 2009). Land markets allow people to invest and financial institutions to provide credit against land as collateral (RICS, 2002 cited in Dale et al., 2006), and provide a mechanism to generate capital from land (de Soto, 2000). Studies have highlighted the role of efficient land markets in improving the performance of a nation's economy by increasing prosperity through the effective use of land (Dale et al., 2006; Williamson et al., 2010; Wang et al., 2018).

Effective land use management and efficient land markets also form the basis of sustainable development (Enemark, 2004). In 1987, the World Commission on Environment and Development (1987) identified a number of concerns, still relevant today, in relation to population growth, economic development, environment protection and the use of natural resources to achieve sustainable development (de Sherbinin et al., 2007; Tracey and Bayley, 2009; Freedman, 2018; United Nations, 2020). Due to population growth and rural-to-urban migration in developing countries, there has been increasing pressure on land for shelter, food production, better living conditions and an improved market economy (Wallace, 2011) This pressure has resulted in the fragmentation of arable land and has led to undesirable impacts, such as a reduction in agricultural land which causes food insecurity, haphazard development and environmental degradation (Wang et al., 2018; United Nations, 2020).

Such undesirable impacts of uncontrolled land use have required governments to take measures to regulate its use. Governments intervene in the land market by introducing land use regulations to limit the negative impact of uncontrolled use of land which results in environmental degradation, food insecurity and haphazard developments (Williamson et al., 2010). However, such interventions can cause the land market to

behave differently and can result in outcomes which may impact all its stakeholders. It is therefore important to eliminate the unforeseen impacts of well-intentioned land use regulations and policies on the land market (Dowall, 1995).

Countries that have regulated land use have experienced an impact on their land markets. In India, the introduction of restrictive land use regulation to control land fragmentation resulted in increased transaction costs (Awasthi, 2009). In the UK, the broad economic impact of planning policies increased housing costs and taxes, leading to an undersupply of developed land (Cheshire and Hilber, 2011; Cheshire, 2018). In another example, land use regulation reduced the supply of residential land in Brazil, which increased housing rents (Lima and Silveira Neto, 2019). In Nepal, the focus of this research, land use regulation restricted the fragmentation of agricultural land through an enforced agricultural classification throughout the country (Government of Nepal, 2017b). These restrictions led to widespread dissatisfaction which resulted in litigation against the government's decision (Himalayan News Service, 2017; Rimal, 2018).

The introduction of land use policy in Nepal, the subsequent regulation of land use and the passing of the *Land Use Act 2019* (Government of Nepal, 2012, 2015b, 2017b, 2019) identified a policy gap in Nepal's land use management . The evolution of policy reform in the land management sector in Nepal provides an opportunity to examine the impacts of regulation on the land market, explore the theoretical underpinnings of land market impact assessment and identify key areas for land market reform. This study addresses these concerns by identifying and measuring the impacts of land use regulation on the land market in Nepal. It firstly identifies the impact on the land market from the perspectives of stakeholders and then examines documentary evidence to complement and validate the perspective-based findings.

1.2. Research Formulation

1.2.1. Research Problem

The land market is a composite construct consisting of economic, social, financial and institutional components; therefore, it cannot be fully explained by mainstream economic theory (Dale and Baldwin, 2000; Williamson et al., 2010; Needham et al.,

2011). However, a large body of literature that addresses the land market has focused solely on its economic dimensions such as land price or value (Courant, 1976; Ihlanfeldt, 2007; Alexander, 2014; Woestenburg, 2014; Dirgasova et al., 2017; Cheshire, 2018; Lees, 2018) or the demand for and supply of land (Cheshire and Vermeulen, 2009; Glaeser and Ward, 2009). A number of researchers have considered customer satisfaction during the land transaction process (Tuladhar and van der Molen, 2003) while others have focused on issues of property or use right (Williamson and Wallace, 2007; Jacobs, 2010; Needham et al., 2011). Some have also discussed the relationship between land use and the land market in the context of sustainable development (Enemark, 2009; Williamson et al., 2010). They have identified a range of impact factors across the economic, social, environmental and institutional dimensions which impact the land market. Considering only limited dimensions in assessing a land market delivers incomplete impact results (Needham et al., 2011). On the other hand, holistically measuring the impact of land use regulation on a land market entails a range of factors which together identify its impact across a given dimension.

However, directly combining the individual impacts associated with different factors is not possible because of their varying context and measurement scales. Therefore, a normative approach to impact assessment would not identify the cumulative impact across a given dimension. An integrated approach to land market assessment that holistically addresses the broader impact of land use regulation across the market's economic, social, environmental and institutional dimensions is still lacking.

Therefore, the research problem to be investigated in this thesis is as follows:

Existing methods for measuring the impact of land use regulation on the land market do not adequately account for institutional, social, economic and environmental factors. Therefore, a holistic approach is required to measure the impact of land use regulation on the land market in Nepal.

The research problem calls for an integrated approach that incorporates various impact factors across multiple dimensions. This would identify the impact of land use regulation on the land market by considering stakeholders' perspectives on the relative changes in the land market. This approach should also be complemented by

documentary evidence collected from relevant organisations in the study area in Nepal regarding the actual changes that have resulted from land use regulation and policy changes.

1.2.2. Research Aim, Research Questions and Objectives

Given this research problem, the central aim of this research is:

To identify the impact of land use regulation on the land market in Nepal across the economic, social, environmental and institutional dimensions by utilising an integrated approach.

In considering the above research problem and aim, the following research questions were formulated:

1. Can an understanding of existing theories be applied to identify the impact of land use regulation on the land market? What are the impact factors that can be applied in assessing a land market?

2. What are the measures taken in the implementation of land use regulation in Nepal that can impact on its land market?

3. How can the stakeholders' perspectives be incorporated into measuring the impact of land use regulation on the land market?

4. How do the perspective-based findings compare, complement and contrast with the findings from documentary evidence and archival records?

The following specific objectives were formulated to answer the research questions and to achieve the research aim:

1. To review the theoretical foundations of the relationship between land use and land market, land market assessment practices, and identify the land market impact factors.

2. To review the implementation of land use regulation and prevalent land market structure in Nepal.

3. To assess the impact of land use regulation on Nepal's land market through stakeholders' perspectives.

4. To identify the changes in the Nepalese land market as evidenced by documents and archival records.

5. To compare, complement and contrast the perspectives-based impact assessment with the findings of the documentary evidence and archival records.

1.3. Research Justification

Very few studies have been able to assess the impact of land use regulation on the land market in a holistic manner. A large body of literature has focused on the change in the real estate property price or value as a consequence of the introduction of land use planning or regulations in the land market (Courant, 1976; Ihlanfeldt, 2007; Cheshire, 2018; Lees, 2018a). Although attempts have been made to assess land markets by considering multiple impact factors (Dale and Baldwin, 2000; Needham et al., 2011), these efforts have not translated to an understanding of the holistic impact of the introduction of land use regulation on the land market.

Researchers in the UK, Europe, the USA and Australia have made significant progress in modelling the land market and/or assessment of it at the technical, empirical and theoretical levels. The Land Market Assessment tool developed by Dowall (1995) focused on estimating the future price or supply of land based on the existing land market scenario; it can be used for strategic planning. Needham et al. (2011) argued that mainstream economic theory could not entirely describe a land market and therefore requires other segments of theory that can be conceptually used in land market assessment. The Urban Land and Housing Market Assessment toolkit developed by Monkkonen et al. (2020) outlines a method to prioritise interventions for urban housing supply by identifying the most amenable government actors who have the greatest capacity for action reform. Moreover, the binding relationship of land use and the land market, discussed in the context of a land management paradigm to deliver sustainable development, also calls for an investigation across the economic, social, environmental and institutional dimensions to understand the impact of land use policy reform on the land market (Enemark, 2009; Williamson et al., 2010a). There is a need

for research to explore how the land market is assessed and to identify the impact of land use regulation on the land market across the above dimensions.

With the growth in populations and rural-to-urban migration, developing countries around the world have experienced mounting pressure to manage the demand for land while also addressing the challenges of protecting the environment and sustainably utilising its natural resources (Williamson et al., 2010; United Nations, 2020). Countries have therefore introduced land use regulation to control haphazard land use, protect their arable land and assist in land management. However, the challenge is also efficiently managing the operation of the land market following the introduction of land use regulation. An assessment of the impact on the land market across multiple dimensions will support these countries to effectively implement their land use regulation while also safeguarding their land markets.

The impact of land use regulation on a land market cannot be easily generalised. It varies across cases and jurisdictions. It is dynamic, relative and contextual. A land market outcome can be positive for a particular group of stakeholders but can be negative for others. The impact of land use regulation on the land market is also specific to institutional, legal, and socio-economic and cultural settings (Dale et al., 2006). There have been few systematic studies that have investigated the impact of land use regulation across multiple dimensions on the land market in developing economies.

This research will provide a deeper understanding of the relationship between land use and the land market in developing economies by identifying the impact of land use regulation on the land market in Nepal. It will contribute to knowledge by providing new insights into how the land market can be assessed and by identifying impact factors specific to the Nepalese land market.

1.4. Research Approach

This thesis adopts a mixed-methods research approach of synthesising the qualitative and quantitative exploration of impact assessment based on stakeholders' perspectives, and then undertaking a quantitative evaluation of the changes in the land market. The study adopts a research onion design framework to identify the impact of land use regulation on the land market. Each research question contributes a building block

towards identifying the impact of land use regulation on Nepal's land market; the questions identified by the background studies were found to be difficult to answer through a single approach.

Both qualitative and quantitative approach using an interview and survey strategy was identified as a suitable method for addressing the impact of land use regulation on the land market, based on the stakeholders' recorded perspectives. However, the identification of this impact would not be complete if the land market were assessed based only on stakeholders' perspectives. Therefore, to complete the assessment, the land market outcomes were quantitatively compared using the data collected from government agencies and other sources. This use of mixed methods minimises the weaknesses of a single approach by complementing these with the strengths of other methods (McDougall et al., 2007). The survey approach helped identify the degree and direction of the impact across a range of stakeholders. At the same time, the documentary evidence complemented the findings and validated the outcomes.

The opportunity to understand the diversity of stakeholders' views is important in an exploratory study and can be useful in validating research findings. The diversity and divergence of stakeholders' perspectives is well known, but also reflects reality within their contexts. This helps to identify the degree and direction of land market outcomes.

In summary, the research approach comprised four stages: 1) research formulation; 2) identification of impacts based on stakeholders' perspectives in qualitative and quantitative study; 3) identification of the impact based on the documentary evidence in a quantitative study; 4) synthesis of the qualitative and quantitative findings. Figure 1-1 illustrates the research approach adopted.

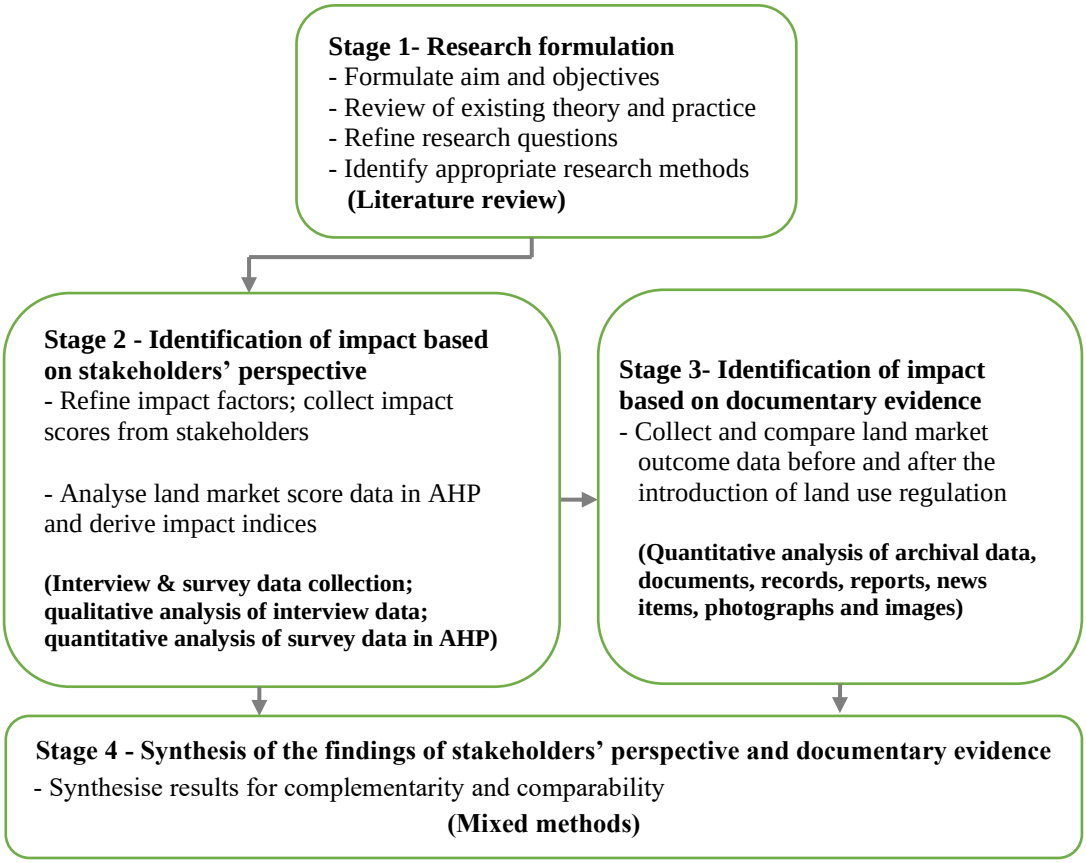


Figure 1-1: Research design

Stage One involved the formulation of the research aim and objectives. This included identifying gaps in measuring the impact of land use regulation on the land market in Nepal. I reviewed the existing literature to gain an understanding of the theoretical and philosophical underpinnings of land market assessment and then refined the research questions and identified the research methods.

Stage Two entailed the collection of interview and questionnaire survey data to identify the impact of land use regulation on the land market in Nepal, based on stakeholders' perspectives. I used the interview data to refine the land market impact factors relevant to the Nepalese land market from the perspective of the stakeholders. The survey data was used to obtain the impact score through an analytic hierarchy process (AHP) to identify the impact across multiple dimensions.

Stage Three of this study involved the identification of changes in the land market based on documentary evidence. I collected the land market outcome data relating to each of the impact factors before and after the introduction of land use regulation, and then compared these to identify the changes.

In Stage Four, I synthesised, compared, interpreted and validated the findings from Stages Two and Three.

1.5. Structure of the Thesis

The thesis is structured into eight chapters.

Chapter One presents the overall introduction of the research study. It presents the background of the research and discusses the importance of the land market. The overall aim of the study is stated, research questions are formulated, and the objectives are specified. It provides a summary of the research approach and discusses scope and limitations.

Chapter Two reviews the literature on land markets, land market theory, the land use–land market relationship, and land market impact assessment practices. It also explores land market impact factors across the literature reviewed. This chapter addresses the first research question.

Chapter Three reviews land use regulation and the land market structure in Nepal. It describes the geographic and socio-economic situation and the existing practices of implementing land use regulation in Nepal. This chapter also presents the fundamental components of the land market in Nepal from the perspective of a three-pillar model of the land market: land valuation, financial institutions and land registration systems and cadastral services. This chapter addresses the second research question.

Chapter Four describes the research design and methods. A mixed-methods approach is selected and justified to explore and identify the impact of land use regulation on Nepal's land market. The chapter presents a thorough description of the methods adopted to collect and analyse the primary data, which was collected through interviews and a questionnaire survey. The analytic hierarchy process (AHP) was used to identify the impact of land use regulation on the land market based on the stakeholders' perspectives. This chapter also presents the methods adopted for the collection of documentary evidence. Methodological issues, including validity and ethical considerations, are discussed at the end of the chapter. This chapter partly addresses the third research question by proposing an approach for incorporating

multi-stakeholders' view in identifying the impact of land use regulation on the land market.

Chapter Five presents the results of the empirical analysis of the interview and survey data collected separately with three different participant groups which represent: (i) land administration agencies; (ii) land developers, owners and professional land organisations; (iii) banks and financial institutions. The interview results supported the refinement of the land market impact factors explored through the literature review. Responses from the survey questionnaire distributed to over 180 participants across the three groups were processed through AHP to derive impact indices across each dimension. Impact indices, as viewed by each group of stakeholders, were also derived to show how the perspectives-based land market impact differed across the variety of stakeholders.

Chapter Six presents the impact of land use regulation on the land market viewed across the economic, social, environmental and institutional dimensions as revealed by the documentary evidence. The comparative analysis, based on the quantitative data, before and after the introduction of land use regulation, is presented to identify changes in the land market.

Chapter Seven first reviews of the results obtained by the analysis described in Chapters Five and Six before synthesising and interpreting these findings and then discussing their implications, including the key reform areas affecting the land market. This chapter addresses the fourth research question.

Chapter Eight, the final chapter, presents the conclusions and suggests to future research It offers an overview of the results concerning the central aim of the research and the research objectives. In this chapter, recommendations are made for further research.

1.6. Scope and Key Assumptions

The term 'land market' is a generic term which can be viewed using various taxonomies. Depending on how rights are transferred or defined during a transaction, a land market can be classified as a land sales market, a land rental market or a share-cropping market. Geographically, a land market can be classified as a rural land market

or an urban land market. A single jurisdiction can have different land markets depending on how rights are assigned or where the land is located. The urban land market is more sensitive to restrictive land use regulation because it affects the demand and supply of land for housing. This study focuses on the urban land market of the Kathmandu Valley in Nepal.

A land market is a complex system of processes, where participants such as landowners, buyers, financial institutions, land developers, professional organisations and land administration authorities interact to realise an outcome. This study assumes that the introduction of land use regulation into the land market is perceived by its stakeholders differently and can provide a validate perspective on that market and the impact of land use regulation when considered in association with other data and indicators.

The terms ‘stakeholders’, ‘actors’ and ‘participants’ have been used interchangeably throughout this study. They are persons who have a stake in the land market, and who may or may not be directly involved in land transactions. For example, real estate agents, lawyers, landowners and buyers may be directly involved in a land transaction. Land developers may need to acquire approval to develop their land to ensure that the development does not produce negative environmental impacts; they sell the land produced after development. Banks and financial institutions provide credit for buying land and property. Land administration agencies implement land laws and, while not involved in the selling or buying of land, also have a stake in the land market and can have a significant impact on it through their involvement.

This study did not include an in-depth analysis of the economic changes that may occur due to the introduction of land use regulation as it is not the intent to focus solely on the economic dimension. The changes in the land market are a function of multiple factors across several dimensions. Policy reforms can have multi-dimensional impacts on the land market, so the purpose of this study was to understand the impact in a broader economic, social, environmental and institutional context.

1.7. Chapter Summary

This chapter has presented the background and introduction to the research. It introduced the research problem, its aim and objectives. The research problem has

been justified and the research approach briefly described. The thesis structure has been outlined and the scope of the work discussed. The next chapter provides the theoretical foundation for the land use – land market relationship, identifies the land market assessment factors, explores land market assessment practices, identifies the research gap and discusses a new approach for identifying the impact of land use regulation on the land market in Nepal.

Chapter 2: The Land Market and Land Use Relationship

2.1. Introduction

The previous chapter introduced this research by identifying the research problems, aim, objectives and research questions, and summarising the research approaches. This chapter presents a review of theories to identify the relationship between land use regulation and the land market and explores how these theories can be applied in assessing the impacts of land use regulation on the land market. Impact factors and indicators that can be employed in measuring the impact of land use regulation on the land market are explored through a desktop review. Land market impact measurement practices are examined across the literature and research gaps are identified. This chapter thus achieves the first objective of this research.

This chapter commences with the definitions of key terms, including 'land market' and 'land use regulation' in Section 2.2. Section 2.3 explores theories for identifying the land use – land market relationship. A brief review of 'land administration theory', 'neoclassical economic theory', 'new institutional economic theory', 'old institutional economic theory', 'transaction cost theory' and 'urban land market theory' is presented in separate subsections. Section 2.4 reviews the empirical literature discussing the impact of land use regulation on the land market in various countries. Section 2.5 reviews the empirical literature and identifies preliminary sets of land market impact factors addressed in these studies. Section 2.6 presents the methods of impact measurement practices. The gap in existing theories and impact measurement practices is discussed in Section 2.7. The outcomes detailed in this chapter lead a definition of the strategy and scope of the fieldwork to be conducted for data collection. The chapter concludes with a summary in Section 2.8.

2.2. Definitions

Understanding the impact of land use regulation on the land market entails a description of the relevance of both this regulation and market in the context of this research. The literature indicates an association of land use regulation and the land

market with sustainable development (Williamson et al., 2010; Mitchell et al., 2019). Land use planning and the land market have been identified as the tools of land policy implementation frameworks and are often executed by a land administration system. Over the past two decades, land administration systems have evolved innovative concepts which make them responsible, accountable, ethical and goal-oriented (Mitchell et al., 2019). Some authors have addressed the new concept of 'measuring the change' produced by a policy intervention within a responsible land administration system (Zevenbergen et al., 2018, p. 8). Considering the relevance of these innovations in the context of measuring the impact of land use regulation on the land market, a brief review of land markets, land use regulation, sustainable development, responsible land administration systems, and impact measurement is presented in this section.

2.2.1. Land Markets

In a modern-day economy, most goods and services consumed are acquired through the market. Depending on their financial capacity, consumers are free to select objects that are placed in the market by the providers. A land market is a specific type of market that acts as a medium for the exchange of rights to land for money or benefits accrued from that land (Dale et al., 2006). Palmer et al. (2009, p. 18) define the land market as "…mechanisms by which rights in land and housing, either separately or together, are voluntarily traded through transactions such as sales and leases." Although these definitions do not directly specify the 'market participants', they indicate their existence by using the terms 'exchange' or 'voluntarily'. The presence of participants is the necessary condition for a land transaction to occur.

Dale and Baldwin (2000) introduced the three-pillar land market model, which assumes that a land market is an integrated mechanism supported by land valuation, land registration and cadastre, and financial services, which ultimately provides 'goods and services' to the participants. Wallace and Williamson (2006) reinforced the inclusion of participants in a land market by adding 'cognitive capacity' as the fourth pillar in their amended version of modern land markets.

Needham et al. (2011) described the land market as a complex system of processes where several actors, such as landowners and buyers, financial institutions, land developers and their professional organisations, and land administration authorities,

interact at different levels to achieve a market outcome. These actors or participants may have different perspectives of the impact of policy intervention based on the existing economic, social and cultural situation, and the institutional setting of the land market. Personal interest and professional experience also play a role in shaping an understanding of the impact of institutional changes. Participants or stakeholders may experience such changes in the regulation of the land market as: changes in land value or tax; changes in the demand for or supply of land; changes in mortgage availability; conflicts or burdens created through the transaction process; changes in usage rights. The perspectives of participants cannot be ignored in assessing a land market because it is these participants who ultimately bear the market's impact and respond to it accordingly. Therefore, a synthesis of stakeholders' perspectives, with quantitative evidence of the impact across several other land market segments, is essential in making a holistic land market assessment.

2.2.2. Land Use Planning

In the literature, land use planning is identified as a tool that allocates land for different uses across a landscape in a way that sustainably meets the needs of stakeholders while safeguarding resources for the future (Metternicht, 2017). Land use planning involves the systematic assessment of land in order to select and adopt the best land use options (FAO, 1993). UNECE (2005, p. 52) defines land use planning as "…the process of allocating resources, especially rights to use land in particular ways, in order to achieve maximum efficiency while respecting the nature of the environment and the welfare of the community". A review of the literature identified a growing emphasis on land use management in order to arrive at a better understanding of the legal, social, institutional and economic implications of planning, rather than simply relying on technical aspects of land use planning (Enemark, 2005; Williamson et al., 2010; Mitchell et al., 2019). Land use planning cuts across many issues, so interdisciplinary or cross-agency thinking becomes an essential component in addressing the outcome of planning intervention in the land market. This often will require a multidimensional approach to impact assessment, as discussed by Zevenbergen et al. (2018) in the context of an innovative land administration system.

Depending on the approach that is adopted, to the area to be covered by planning and to the sectoral focus, priorities and needs driven by changing circumstances, various

types of land use planning were observed despite having many common characteristics. Spatial land use planning, integrated land use planning, centralised planning and participatory land use planning were found to be classified based on the methods adopted. Land use planning based on spatial coverage was found to be classified as national/provincial, regional or catchment-based land use planning. Based on the requirements of different thematic sectors, agricultural land use planning, transportation planning, ecological planning, urban planning, rural planning, and risk-sensitive land use planning were identified (Metternicht, 2017; Wehrmann, 2017). Similarly, land zoning was found to be a priority set by the government—either as fiscal zoning, which focuses on tax and revenue collection, or as externality zoning, which focuses on the control of land use to protect the environment (Ohls et al., 1974).

Several authors also discuss *land pooling* as a cost-sharing and participatory approach that involves the acquisition, consolidation, planning, subdivision, development and redistribution of land to respective landowners (Archer, 1978; Williamson et al., 2010; Faust et al., 2020). Land pooling is primarily used to manage peri-urban expansion (Rasheed and Parambath, 2014). Land readjustment was first introduced in Germany in 1920 (Williamson et al., 2010) and quickly spread across the world, including in Europe (Belgium, Finland, France and Sweden), Australia (Western Australia), Asia (Japan, South Korea, Thailand, Nepal, India and Indonesia) and the Middle East (Israel, Palestine and Lebanon) (Rasheed and Parambath, 2014). Land pooling aims to repurpose the allocation of land into social and business uses by enhancing the environmental and physical quality of the planned land, which results in an increase in land value.

These diversified types of land use planning overlap and share many characteristics. They can be implemented through a combined approach, such as a regional economic planning approach, comprehensive integrated approach, land use management approach or urbanism approach, as discussed by Williamson et al. (2010). Land use planning is performed within a broader framework that considers the prevalent legal, political, socioeconomic and environmental conditions and is often guided by the land use policy of the jurisdiction under consideration.

2.2.3 Land Use Policy and Land Use Regulation

Governments often make decisions about the future use of land to maximise economic, social and environmental output more sustainably. They provide guidelines and mandate an operational body to implement or allow the legitimate use of land while considering the needs of present and future generations. The set of guidelines forms a land use policy document that works as a framework which directs how land should be used and conserved according to national objectives.

Land use regulation is a system of government-enforced restrictions on the development and uses of land and properties built on land (Dale et al., 2006; Williamson et al., 2010). Undesirable environmental impacts of the uncontrolled use of land can compel governments to control its use by introducing land use regulation (Government of Nepal, 2017b). Governments intervene by promulgating restrictive regulations to limit the effect of externalities caused by uncontrolled use of land, such as environmental degradation and food insecurity.

Land use planning is a tool to implement land use policy which is regulated through land use regulation. In the absence of land use regulation, the implementation of policy guidelines is not possible. In developing countries, it is challenging—for a variety of underlying economic, social and cultural reasons—to find a land market that comprehensively considers land regulation and zoning. These countries are facing rapid changes in the distribution of land for different purposes and, therefore, have experienced rapid changes in land market dynamics. A land market may be considered in three contexts: (i) a complete absence of land use regulation or related practices; (ii) largely implemented land use regulation or practices; (iii) partial or sporadic implementation of land use or related regulation.

The third situation can often be observed in those developing countries which practise the sporadic implementation of a variety of land use control or restriction, including: designating land zones to specified areas; land pooling and developing particular areas; designating national parks and buffer zones; defining rights of way for roads and rivers; designating development areas such as airports, special economic zones or urban expansion areas; subdivision control or the implementation of building codes. These practices impose varying degrees of restriction on the use of land. Loxton et al.

(2013) argue that, in the social context, the individual effects that result from policy changes and other interventions interact and aggregate within a particular dimension to form a cumulative impact across that dimension.

Introduction of a form of land use regulation is regarded an institutional intervention that can have an impact on the land market's process and outcome (Needham et al., 2011). While the system of the land market is fundamentally conceptualised to realise the supply of land or the transfer of property rights on land as the 'market goods', land use regulation generally prescribes the way in which land should be used. The tendency of land use regulation is to encourage the right use of land by specifying various restrictions on its use in various forms, such as land zoning, subdivision restriction, lot-size standardisation or land pooling. Williamson et al. (2010a, p. 173) argue that the use of land "…might may be limited through public land use regulations and restrictions, sectoral land use provisions, and various kinds of private land use regulations". However, it is not land rights that may be affected by land use regulation. The impact of land use regulation is a function of several land market impact factors across the economic, social, environmental and institutional dimensions (Dowall, 1995; Jaeger, 2006; Wu, 2008; Zevenbergen et al., 2018). Several theoretical viewpoints concerning the land market are presented in the literature, and these can be discussed in specifying the land use – land market relationship, as in the proceeding sections.

2.2.4. Impact of Land Use Regulation on the Land Market

The concepts of *effective land use* and an *efficient land market* have been discussed in relation to building a land administration system which, in a broader context, supports efforts to achieve sustainable development (Enemark, 2005; Williamson et al., 2010; Mitchell et al., 2019). The implicit interrelationship between *land value*, *land use* and *land tenure* gives rise to a diversified 'interest' across economic, social, environmental and institutional dimensions (Dale and McLaughlin, 1999). While effective land use promotes land development, it may act as a catalyst for promoting land value to the extent that land becomes a tradable good and thus gives rise to a land market. *Land value* represents a foundational component of the land market; land use regulation is a part of a broader land policy framework (Dale et al., 2006; Wallace and Williamson, 2006). Changes in the value of land or its demand or supply as the function of economic, social, environmental and institutional factors stimulated by the

introduction of land use regulation can be recognised as an impact on the land market. From the perspective of sustainable development, this study explores whether the implementation of land use regulation meets the interests of various land market stakeholders across the economic, social, environmental and institutional dimensions.

However, stakeholders can have different perspectives on the changes occurring in a land market resulting from a policy reform or introduction. On the other hand, the land market outcome is not limited to the economic perception of 'land value'. Participants who receive 'services or goods' in the land market are the social components of the land market who can experience changes in the land market across the social dimension (Needham et al., 2011). Implementing a land use policy can also result in environmentally friendly outcomes which may promote the demand, supply and environmental 'value' of land. The policy implementation may also strengthen or challenge land rights, either fully or partially, and may discourage or promote the informal land market. Stakeholders' perspectives on these aspects of changes in the land market as a consequence of the implementation of land use regulation can indicate its contribution to sustainable development and can be explained or validated through empirical evidence.

2.2.5. Responsible Land Administration System

A responsible land administration system, or RLAS, is an innovative concept that addresses ethical and societal issues, and thereby promotes socioeconomic development and alleviates poverty and food insecurity (Zevenbergen et al., 2016b). RLAS goes beyond the framework of the 3Rs—rights, restrictions and responsibilities (Bennett, 2007)—and builds upon the new framework of the 8Rs—responsiveness, robustness, respectedness, recognisability, resilience, reliability, reflexiveness and retracability (de Vries and Chigbu, 2017; de Vries, 2021). Mitchell et al. (2017) identify eleven different requirements for a land administration system to be responsible: secure land rights for all, non-discrimination, equity, gender sensitivity, inclusiveness and participation, rule of law, transparency, accountability, affordability, scalability and sustainability. RLAS must also ensure the validity of the technical and institutional structures involved in the policy intervention, the process they follow, their appropriateness and the measurement of output and impact based on proof or evidence on the ground (Zevenbergen et al., 2018).

Land use policy intervention is intended for the better management of land to achieve food security, environmental protection, security of tenure and socioeconomic development. However, the outcome of the policy intervention for the land market may not meet the expectations of the market actors. The outcomes and impacts of a policy reform depend on how the policy is implemented and the quantity and quality of information held by the land administration system (Enemark et al., 2014). Ensuring better outcomes and positive impacts requires that implementing authorities have clear guidelines, clarity in the process, and a sufficient quantity of quality information. Market transactions of tenure rights are required to comply with national land use regulation and not put core development goals at risk. Recordation, recognition and respect of tenure rights holders, and refrainment from the infringement of tenure rights, are among the key factors of responsible tenure rights governance (Food and Agriculture Organisation of the United Nations (FAO), 2012). Responsible land administration systems are required to innovatively address the changes produced by policy intervention, particularly by using available fit-for-purpose technology, adopting goal-oriented processes and inter-disciplinary thinking, enhancing the skill of land professionals, and a service- and goal-oriented attitude by service providers (Zevenbergen et al., 2018). The changes need to be evaluated through different angles across multiple dimensions for land administration to qualify as 'responsible'.

2.3. A Theoretical Foundation of the Land Use – Land Market Relationship

A large body of literature has addressed the relationship between land use and the land market either in the context of a responsible land administration system which delivers sustainable development or while assessing the impact of land use regulation or land use planning on the land market.

2.3.1. Land Administration Theory

In the past two decades, there have been continuous innovations in the ways of viewing land administration systems. The latest concept of a 'responsible land administration system' (RLAS) addresses aspects of land governance which go beyond the concept of 'best practices' in land administration systems as previously discussed by Williamson (2000), 'good governance' in land administration as discussed by Grover

et al. (2007) and 'responsible tenure governance' discussed in Food and Agriculture Organisation of the United Nations (FAO) (2012). Although the newer concepts addressed the social, socio-economic and ethical issues of land administration, the fundamental concept of land market given by Dale and McLaughlin (1999) is still relevant to the discussion of the relationship between land use and land market.

The fundamental theory of land administration holds that an environment for a land market is created when owners of land generate the perception of land value through their productive use of the land, as demonstrated by the triangular relationship of the use, value and ownership of land (Dale and McLaughlin, 1999). A land market is conceptualised as an institutional arrangement supported by the three pillars of land valuation, land registration and cadastre, and financial services (Dale and Baldwin, 2000). Given the interrelationship between value, ownership and use in a given land administration system, the theoretical relationship between land use and the land market can be observed because of the commonality of the components of each (Figure 2-1).

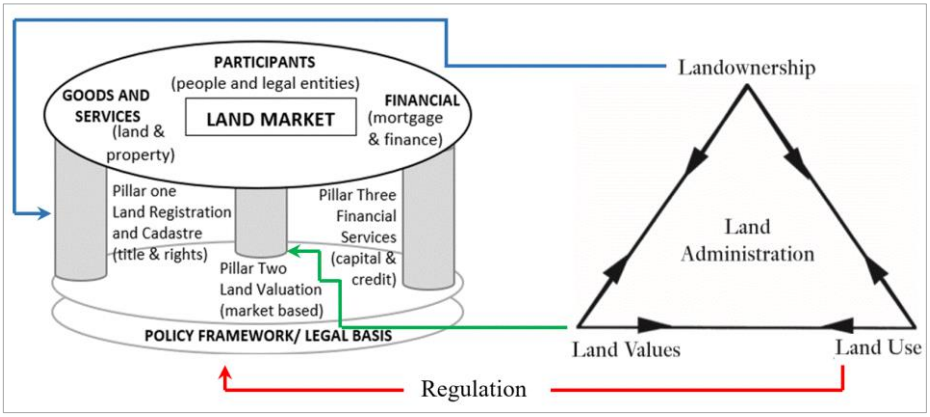


Figure 2-1: Relationship between land use regulation and land market

Figure source: Land market (Dale and Baldwin, 2000, p. 6), and Land administration (Dale and McLaughlin, 1999, p. 9)

Land administration theory is based on the premise that the right of land ownership allows landowners to use their land. The way the land is used is prescribed by the relevant policy framework in each jurisdiction and is the foundation on which the land market rests. The use of the land generates its value. When this value is perceived, then land trading begins in a society, giving rise to a land market. In a formalised land market system, the rights associated with ownership of the land are recorded and maintained by a system of land registration and cadastre, and its valuation system is

established. The land value may encourage landowners to invest additional resources in the land for higher productivity. Such investment is often supported by financial institutions as further enhancing land value and thus promoting mostly residential or commercial land use and, subsequently, land transactions (Dale et al., 2006; Williamson et al., 2010).

However, suppose the efficient and productive use of land, as discussed above, contributes to promoting its value and encouraging people to have access to the land. In that case, the restriction on its use can also have an effect on its value and may thus limit access to the land. Either way, this affects the land market. This relationship lends validity to the claim that, in general, changes in land use regulation cause changes in the land market. (Dale et al., 2006, p. 6) explicitly stated that '…land use and environmental controls…' are some of the influencing factors (Figure 2-2) (also cited in Koroso., 2011; Dawadi, 2018).

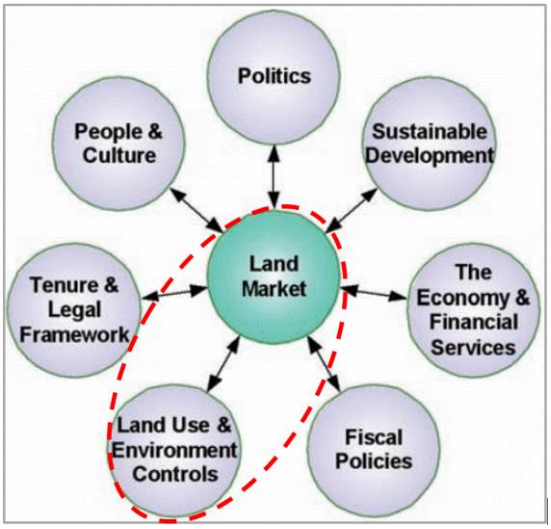


Figure 2-2: Factors affecting or affected by the land market

Source: Dale et al. (2006, p. 7)

The model presented by Dale and Baldwin (2000) enhances the scope of the impact of land use regulation on the land market by identifying various pillars of the land market. According to their model, the impact is confined to land value and different aspects of a land market such as financial services or credit accessibility. It relates to the quality of land registration and cadastral records, especially the land use information records in the context of this study. The very presence of 'participants' indicates that there can be social aspects of the impact, which is further reaffirmed by the addition of a fourth

pillar in the land market model by Wallace and Williamson (2006). In the context of building land markets, they comment:

> Usually, people assume that land markets are the realm of human activity involved in buying, selling, leasing and securing land. This focus stresses the physical and directs analysis away from the social and cognitive capacities supporting successful land markets. (Wallace and Williamson, 2006, p. 124)

The above assertion indicates that a land market should not generally be seen as simply an activity of economic interest but also as a function of social interest and knowledge. Widening the theoretical scope of the land market beyond the economic dimension to the social dimension, Needham et al. (2011, p. 162) quote Lindblom (2001): "Think society, not economy."

Enemark (2005) discusses the land management paradigm that effective land use management and efficient land use planning can deliver sustainable development, provided there is land information infrastructure (Figure 2-3). The literature indicates that achieving sustainable development must address issues across the economic, social, environmental and institutional dimensions (Spangenberg, 2002; Pivasevic and Hafner, 2013; United Nations, 2018). This implies that if land use regulation impacts the land market, then, based on the above discussion, it can have consequences across the economic, social, environmental and institutional dimensions. However, describing the extent of the impact of quantitative terms is outside the scope of land administration theory. The following sections review neoclassical economic theory, old institutional economics theory, new institutional economics theory, transaction cost theory and urban rent theory to further identify the theoretical bases for the holistic measurement of the impact of land use regulation on the land market.

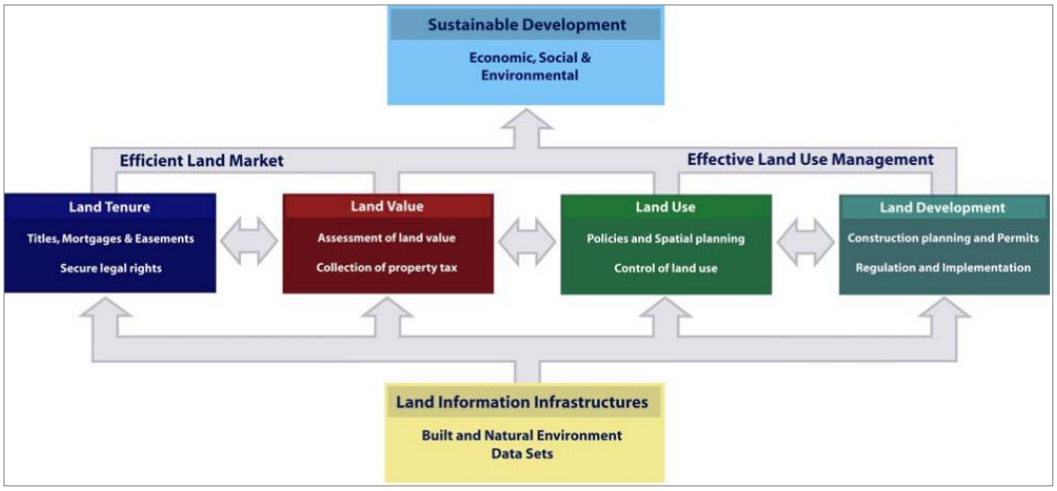


Figure 2-3: Land use management and land market for sustainable development

Source: Enemark (2005, p. 3)

2.3.1.1. Theory of Neoclassical Economics

Neoclassical economics considers that value is only constituted if it provides utility to consumers. In the market economy, the land is reduced to a factor of production and conceived as an object of consumption. Land and its resources do not have any value in themselves. Instead, value is revealed by demand. Private production and consumption decisions, such as allocating land or resources between alternative uses, are taken to maximise the utility accruing to individual producers or consumers. According to this logic, land use decisions are mainly governed by the forces of supply and demand. The market determines the price of a product based on the tension between the supply of production and the demand by consumers at the point of equilibrium (Adams, 1994).

Demand and supply are subject to changes due to various factors. Changes in demand occur as a result of changes in income, risk of a product shortage, availability of substitute goods, and consumer expectations. The supply changes with the number of producers, the cost of resources required for production, changes in technology, taxes and subsidies, and price expectations of the suppliers. These factors tend to generate the elasticity of demand and supply in the market. In the land market, the supply of land (elasticity of supply) is affected by:

- Price speculation: landowners expect a future price increase and therefore are reluctant to sell the land at the current market price.

- The imposition of standards such as minimum lot sizes, which requires a greater quantity of land for housing purposes. In a regulated land market, most suppliers may not possess the quantity of land required by the standards. Such a threshold standard tends to lower the supply of land in the land market.

- The imposition of subdivision restriction: the landowner's supply is reduced as the landowner cannot transfer the rights to land to the buyer through a subdivision.

- Zoning or designation of a land use class different from what it was before the regulation. Land pooling or development for housing purposes increases the supply for housing purposes. In contrast, the enforcement of land zoning may limit the supply of residential land for housing purposes.

Similarly, changes in the demand for land (elasticity of demand) occur if:

- There are changes in the quality of land for a given purpose. Execution of land development or land pooling increases land quality and tends to increase the demand for land for housing.

- Population growth increases consumption.

- Changes in income or changes in the credit supply.

In a market-based economy, changes in the price of land occur with shifts in demand and supply.

If the supply is inelastic (or there is no change in the supply), then the market does not receive the amount of land required, and therefore the supply curve remains stationary as S1. The initial demand curve D1 determines the land price at P. However, if demand increases from D1 to D2, the market adjusts the land price to P1, which is greater than the initial P (Figure 2-4).

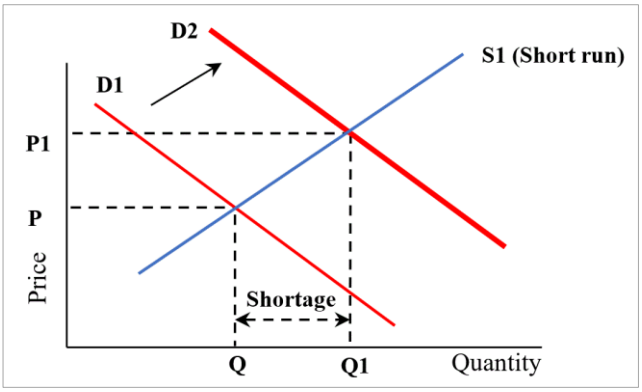


Figure 2-4: Short-term changes in land price during inelastic supply and elastic demand

However, in a free-market environment, the land market gradually responds to consumer demand. If the market responds to the demand caused by changes in regulation to increase the long-term supply from S1 to S2, then the land price P1 reduces to P2 (Figure 2-5).

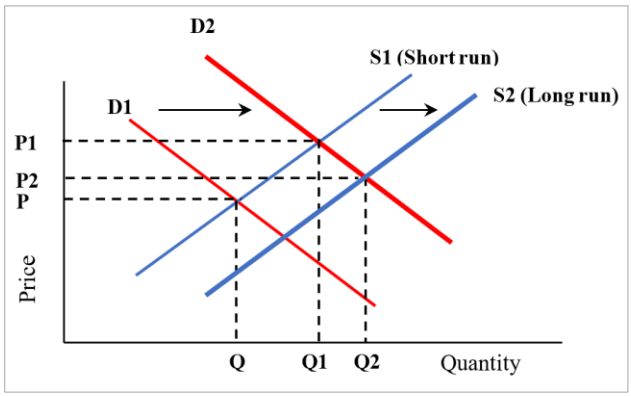


Figure 2-5: Changes in land price in the long run to adjust the demand

The other scenario of land market price changes occurring is inelastic demand relative to the supply. In such a case, the price of land increases negligibly in the short run—for example, P to P1 (Figure 2-6). However, in the long run, the government may respond to the demand by disposing of large areas of land in the market, which shifts the supply curve to the right, S2. In that case, the land price decreases from P1 to P2. If government tightens the supply through land use regulation, then the supply curve shifts towards the left (S2') and land price increases from P1 to P2'.

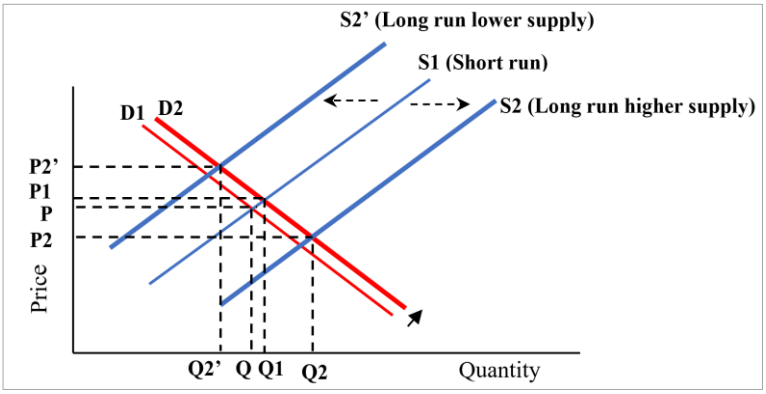


Figure 2-6: Changes in land price when demand is less elastic relative to the supply.

When demand and supply are inelastic, the price remains at equilibrium at point P (Figure 2-7). However, a change in the demand for land from D1 to D2 causes the price to increase from P to P1 in the short term. In the long run, the market's ability to stabilise the price relies on supply (S1 to S2) to meet the demand.

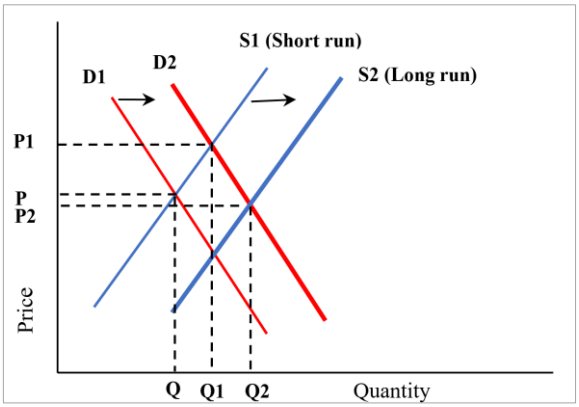


Figure 2-7: Price fluctuations when the demand and supply are both elastic.

The land market cannot supply land as smoothly as other commodity markets due to changes in the quality and, therefore, the price of land. Each parcel differs in characteristic, at least by location, and therefore it is hard to predict land price by simply employing the demand and supply curve. Neoclassical theory cannot be the only means of underpinning the price effect of land on a given parcel if locational characteristics are to be considered. Recent literature has demonstrated that land price can be estimated through complex spatial modelling. Neoclassical theory can only be applied if homogeneity in land characteristics can be assumed in terms of its location and other endogenous properties such as soil type, slope and fertility. Changes in land

price are often attributed to institutional control described as being 'ad hoc institutionalism' (Ball, 1998 cited in Needham et al, 2011 p. 164).

Neoclassical economic theory primarily assumes that the market should be frictionless and there should be no cost during an exchange. However, this condition is impossible to meet because, firstly, governments are keen to introduce various controls such as taxation or land use restriction, land zoning, lot-size control, or subdivision restrictions to minimise the neighbourhood's effect on the land. These restrictions affect the value of property rights. Secondly, the amount of land available in nature is limited, so buyers find themselves in a competitive environment to gain access to land for which there is high demand. Such competition creates land value. Possessing a valuable commodity needs to be registered in an institutionalised system, creating a transaction cost. Furthermore, participants in the land market can have their expectations affected by the introduction of land use regulation. The social, institutional and economic aspects are partially addressed by old and new institutional economics.

2.3.1.2. New Institutional Economic Theory

New institutional economics assumes that markets do not function without friction. It starts from the observation that institutional and governance structures act as constraints on landowners' enjoyment of their property rights. States may take measures against the haphazard use of land to ensure a better social, economic and environmental outcome, which may not be in the interest of landowners. Land is an essential resource with a limited supply. The limitation of natural resources and the risk of externalities may not permit the use of land as the landowners intend. A state may also need to provide public goods for social welfare purpose such as roads, recreational parks and open space through expropriation. While states intend to act for the betterment of society by putting a limitation on the use of land, the issue of property rights emerges as a constraint, as argued by Needham et al. (2011, p. 169):

> Land use planning designates land for particular uses, and this usually excludes other uses. This leads to a segmentation of land markets…and restricts the value of the property rights.

According to Williamson et al. (2010), one of the most contentious issues in the land use – land market relationship is property rights because an inadequate attention to

land rights during the implementation of land use regulation leads to complaints, court cases and conflicts (Godschalk, 2004; Jacobs, 2010). The successful implementation of land use planning depends on the understanding of two parties: the implementing authority and the public. The former requires clarity in the implementation process and informing the public about the restrictions, whereas the latter must recognise their responsibilities regarding the use of their land. The balancing factor in the tension between these two rights is compensation (UNECE, 2005; Keith et al., 2008; Tura, 2018). According to UNECE (2005, p. 52):

> There must also be mechanisms whereby compensation can be provided to owners of land whose rights are adversely affected by any project, for instance where there is reallotment or land expropriation.

However, recompense for loss by compensation is not the ultimate solution. The limitation of the new institutional economics is its focus on governance structures and institutions. It is concerned more with the impact on the transaction of rights and interactions between participants, treating humans like a machine (Needham et al., 2011). However, participants in the land market are indeed human beings who have preferences, expectations and perspectives, which are recognized by old institutional economics.

2.3.1.3 Old Institutional Economic Theory

The old institutional economic theory of the land market assumes that institutions affect the 'preferences' and 'expectations' of participants or actors in the land market; it focuses on the social aspects of changes in the land market. Preferences and expectations are the function of individual interest and vary across markets and their actors. It cannot, therefore, be generalised for all markets. However, studies of a single land market, at least, provide a deep understanding of how it works; they can be used to explain small changes to that market and can be regarded as partial theories (Needham et al., 2011).

Old institutional economics urges researchers to explore institutional contexts to gain a better understanding of expectations that relate to land market outcomes. It also explores the general laws and institutions responsible for the land market. In the context of this study, it suggests identifying the existing land use provisions

responsible for affecting land market transactions and the expectations of its participants in the Nepalese land market. The theoretical model proposed by Needham et al. (2011) represents an integrated view of neoclassical economics, new institutional economics and old institutional economics that helps explain land market outcomes and, therefore, land market assessment (Figure 2-8).

Demanders and suppliers are the key participants in the land market: their interaction maintains the supply of commodities in the market, as discussed by neoclassical

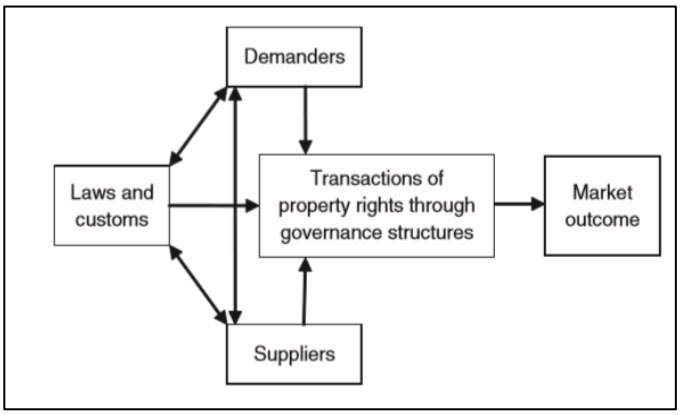


Figure 2-8: Integrated framework of land market assessment
Source: Needham et al. (2011, p. 168)

economics. Laws and customs also impact their expectations and preferences, as held by old institutional economics. However, the expectations of the participants are not limited and subject to variation. To shape land market outcomes, the laws and customs need to guarantee property rights, which are recorded by legal authorities, as already mentioned. However, new institutional economic theory assumes that the institution or laws and customs act as a constraint in the land transaction process and result in a transaction cost.

2.3.2. Transaction Cost Theory

Transaction cost, in this study, is the cost other than the land price or tax that land market participants may pay for a successful land transaction. Such a cost challenges the macroeconomic theory of perfect competition, which assumes that market transactions are costless (Lindblom, 2001). After introducing land use regulation, the involved parties may have to pay extra costs that may differ from the cost incurred to

reach an agreement between the buyer and landowner, or the cost of negotiation between the landowner and implementing agencies to reduce externalities (Rindfleisch, 2019).

McCann (2013) observes that changes in the institutional environment, such as changes in technology or policy, affect the transaction cost. In the context of the land market, participants are required to pay fees and spend time accessing and using land information. While property-rights information held at government-established registers provides a sense of tenure security, landowners may need to bear the cost when they are involved in changes to this information during the transaction. For each land transaction, the name and address of the owner is updated in the records. When land zoning is implemented, the land use classes must be updated (Alexander, 1992, 2014). These updates involve describing 'asset specificity' in land records and ultimately providing the landowner with a feeling of confirmation of their land use right. In other words, they reduce the risk of landowners being insecure in the use of the land they possess.

Government intervention in the land market through land use restriction or zoning implementation may impel affected landowners to react to such decisions. Depending on the degree of restriction, quality and completeness of the information held by the government, landowners may either appeal the decision or request the government to review or accept it. They may also find 'legal loopholes' as an opportunity to 'maintain' the use of their land within the previous land use category or may want to change their preferred land use by challenging the decision in court. While updating the information regarding the 'asset specificity'—either through a simple process or through 'utilising the legal opportunity'—they may need to spend time or money, which increases the transaction cost (Grover and Malhotra, 2001). Comparing the relative changes in the transaction cost before and after the introduction of land use regulation can measure the impact of that regulation on the land market.

Identifying transaction costs is a complex task because it may be influenced by the combination of several directly measurable or non-measurable factors, such as 'sense of risk', making irrational decisions (bounded rationality), lack of coordination, and lack of information, negotiation or communication (Rindfleisch and Heide, 1997; Rindfleisch, 2019). Several facets of transaction cost theory have evolved to address

the factors responsible for transaction cost; nevertheless, it continues to exert a significant influence on marketing because it can be an encouraging or discouraging factor in the formal land transaction process in a given land market (UNECE, 2005).

2.3.3. Urban Land Market Theory

Classical economists established the connection between land use and land value by introducing the concept of 'rent'. The greater the productivity or benefit, the higher the 'rent' paid to the landowners for the use of the land. Selecting a parcel of land for a particular use depends on an endogenous quality such as its fertility or productivity (Ricardo, 1821 cited in El-Barmelgy et al., 2014, p.93) and its distance to the market where the produce is distributed—a concept devised by Heinrich von Thünen (Hubacek, 2002). This concept was focused on agricultural productivity and, therefore, related to the agricultural land market.

Economic bid rent theory, proposed by Alonso (1960) as an urban land market theory, analyses the issue of urban location in terms of distance versus net profits accrued from production. This theory confines the relationship between land use and land value to urban areas. In the simplest terms, stakeholders tend to balance land price, transport costs and the area of land they use. The governing factors are the transport costs (and hence distance), productivity and location. Land users maintain their interest in using the land to optimise their profit for a given activity. They prefer to bid rent for more efficient land use (in respect of productivity and location simultaneously) as there is higher demand for better quality land.

Modern-day economies are not confined to agricultural production and distribution; therefore, the value of a piece of land cannot be described as simply the function of agriculture productivity (El-Barmelgy et al., 2014). Potential buyers of residential land tend to balance their investment by selecting an appropriate location that would represent a trade-off between high land price within the city and the cost required to commute from a property further away from the city. Such costs can consist of transport fares, fuel or the time required to travel between regular destinations.

2.4. Impact of Land Use Regulation on the Land Market

A review of the literature reveals a cause-and-effect relationship between land use regulation and the land market. Countries that have implemented land use regulation have experienced different changes. A study conducted by Dowall (1992) showed that zoning regulation—such as supply constraint, procedural delays and red tape—and subdivision standards caused an increase in land prices in Karachi, Pakistan. In India, the introduction of restrictive land use regulation to control land fragmentation resulted in increased transaction costs (Awasthi, 2009); in contrast, the inadequacy of residential land in Nepal provided landowners, especially those on low incomes, with the opportunity to use agricultural land for residential purposes and derive financial profit (Mathema, 1999). This led to the introduction of a land use policy in 2012 (Paudel et al., 2013), subdivision restrictions in 2017 (Government of Nepal, 2017b) and the introduction of the *Land Use Act 2019* (Government of Nepal, 2019). In the US, the enforcement of environmental zoning and a minimum lot size standard resulted in a land 'scarcity effect' as land prices in the regulated areas exceeded those in unregulated areas (Jaeger, 2006); in the UK, the broad economic impact of planning policies increased the cost of housing and taxes (Cheshire and Hilber, 2011); in Brazil, land use regulation resulted in increased housing rent due to the low supply of residential land (Lima and Silveira Neto, 2019). In New Zealand, the impact of land use regulation caused an increase in land and housing prices (Lees, 2018b). In Ghana, a study found that land prices increase due to the ineffective implementation of land use regulation (Boamah et al., 2012). Based on these results of increasing housing and land prices, which make it hard for the poor to afford housing and land, Dowall (1992) recommends that the implementing authority gain a clear understanding of the implications of their investment and possible land market outcomes.

2.5. Understanding the Impact of Land Use Regulation on the Land Market

A large body of literature discusses the economic dimension of land market impact assessment. El-Barmelgy et al. (2014) present a mathematical or spatial model for estimating land value by analysing legal and political, economic, environmental, social, urban, public interest and demographic issues. Economic factors such as the value, quantity or price of commodities are also governed by buyer behaviour (Howard

and Sheth, 1969), and can be considered impact factors that affect the market (Ohls et al., 1974; Courant, 1976; Ihlanfeldt, 2007; Wu, 2008; Ciaian et al., 2012; Monkkonen and Ronconi, 2013; Alexander, 2014; Luca, 2014a; Woestenburg, 2014; Dirgasova et al., 2017; Lees, 2017). In some instances, land use planning has resulted in the systematic undersupply of land space for both residential and commercial purposes, impacting not only the housing market but also the broader economy (Cheshire and Sheppard, 2002; Cheshire, 2018). Land market impact factors associated with the introduction of land zoning or related restrictions in the economic domain include transaction costs (Dale et al., 2006), demand and supply of land (Dowall, 1992), taxation due to permitted use (Muller, 2002), mortgage availability (Dale et al., 2006; Williamson et al., 2010), compensation (Dale et al., 2006; Mangioni, 2014) and, more importantly, land speculation (Deininger, 2003; Deininger et al., 2010).

The social dimension of policy decisions relates to how a decision aligns with public expectations. Tuladhar and van der Molen (2003) argue that introducing a new land administration or management system can cause delays in service delivery until the participants become familiar with the system. argues that one of the impacts of land use regulation is procedural delays and red tape. Mayer and Somerville (2000) identified delays in the development process caused by land use regulation. In Nepal, the land use implementation directives introduced by the government required a field verification process to ascertain the land categories (Ministry of Land Reform and Management, 2013), a measure that required additional time to conclude the transaction process. The restriction on the subdivision of agricultural land also added a further step in the business process of verifying whether land parcels under transaction qualified for subdivision, creating a delay in the subdivision process (Government of Nepal, 2017b). The land use policy of Nepal does not specify a mixed land use zone, which is a common land use pattern in urban areas (Kathmandu Valley Development Authority, 2015b) and, therefore, does not meet public expectations. Schirmer (2014) identified issues of land availability, employment and identity as part of the socioeconomic impact of land use change. In Nepal, the designation of a land use class on land already purchased for a different purpose raised concerns about economic loss and a lack of fairness of the implementation process (Rimal, 2018). Loxton et al. (2013) argue that individual social impacts resulting from policy changes

and other interventions actually interact and aggregate to form cumulative social impacts.

From the environmental dimension, land use changes can result in either positive or negative impacts on the land market. For example, road expansion has made a comparative improvement in traffic mobility in Kathmandu and increased the amount of open space; however, it has also contributed to sound and air pollution in the vicinity of major roads (Khanal et al., 2017; Ojha, 2019). Standards for residential land development require the development of open space, roads and utility services before the land is brought onto the land market. The demand for residential land with enhanced quality of use is higher than for unplanned developments (Karki, 2004). Burby and Dalton (1994) argue that land use planning puts a limit on to land availability by delineating boundaries of hazardous areas. A study conducted by the National Planning Commission for the feasibility of integrated settlement development in the hilly district of Bajura revealed that 90% of the district is unsuitable for residential purposes (National Planning Commission, 2015; Singh, 2015); it demanded the removal of people from the vulnerable areas. The identification of risk areas also leads to changes in the preference of potential buyers in the land market, who pay a lower level of interest to invest in the risk zone.

The institutional dimension of the land market refers to problems caused either by the inefficient implementation of regulation or additional institutional hurdles that are encountered during the execution of land use regulation. In itself, a new law should not create additional risk for land use or ownership rights (Potsiou, 2006). For example, inadequate government coordination with land market stakeholders before the implementation of subdivision restrictions in Nepal resulted in conflict (Government of Nepal, 2017b; Rimal, 2018). The affected landowners considered that the subdivision restrictions contravened their fundamental property rights (Government of Nepal, 2017b; Himalayan News Service, 2017). Similarly, the implementation of the Guided Land Development Project (GLDP) in Kathmandu could not satisfy the demand to be compensated for the land acquired for the road expansion, forcing the affected landowners to protest and take the matter to court (Khanal et al., 2017). Other institutional factors, such as poor coordination, result in

poor sharing of opinions and experiences, and form gaps that are not filled by any party (Lodin et al., 2015).

Effective land use management and efficient land markets form the basis of sustainable development (Enemark, 2005). However, 'land use' and the 'land market' have a reciprocal relationship, in that the former tends to control landowners' rights to use their land whereas the latter seeks freedom in using their land (Jacobs, 2010; Williamson et al., 2010). There are, in general, two overarching institutional issues that concern rights: the right to live in a safe environment without being affected by the action of others, and to dispose of one's property at one's discretion (Koirala, 2015; Himalayan News Service, 2017). The implementation of land use regulation can also be examined for other issues such as changes in actors' behaviour (Needham et al., 2011) and the organisation's business process (Dale and Baldwin, 2000). The impact, therefore, is not confined merely to the scope of the value or price of land. This implies that the impact of land use regulation on a land market extends beyond the scope of economic theory and simultaneously gravitates towards the social, institutional and environmental dimensions. This invites an integrated approach that incorporates various impact factors across multiple dimensions. Such a framework would help identify the impacts of the introduction of land use regulation on the land market.

The desktop review provided the initial set of land market impact factors/indicators. Although a limited number of studies were identified as relating directly to the measurement of the impact of land use regulation on the land market, many of the variables used in those studies were commonly used in other studies on land use and the land market. Table 2-1 shows the list of pre-identified impact factors and indicators specified in the literature reviewed.

Table 2-1: Land market impact factors related to land use regulation

Authors	Impact factors/Indicators
Reps and Smith (1962)	Subdivision control, supply
Ohls et al. (1974)	Price, value
Courant (1976)	Land price
Shultz and Groy (1988)	Subdivision control, supply
Dowall (1992)	Supply, price, affordability, the standard of planning (adequacy), consideration of future requirements (adequacy or suitability of zoning)
Burby and Dalton (1994)	Hazard, risk, land availability
Dale and McLaughlin (1999)	Laws and institutions, financial instruments and services, land recording and valuation agencies, land rights and records
Dale and Baldwin (2000)	Credit accessibility, demand, supply, cultural acceptance, transparency, social, environmental and economic sustainability, value for money, tax, transaction cost, openness, accessibility, incentives, clarity, compensation
Mayer and Somerville (2000)	Delay, red tape, transaction cost
Bertaud and Malpezzi (2001)	Demand, supply, imposition of higher taxation on consumer
Tuladhar and van der Molen (2003)	Transaction cost, coordination, customer satisfaction
Deininger (2003)	Credit accessibility, transparency, productivity, desirability, subsidies
Karki (2004)	Quality of residential land, supply, open space
UNECE (2005)	Taxation, valuation, informal settlement, tenure security, conflict, satisfaction, information availability, transparency, affordability, environmental sustainability
Potsiou (2006)	Availability of land information, access to mortgage and credit, security, content, information quality and availability, tax
Jaeger (2006)	Value, compensation
Wallace and Williamson (2006)	Mortgage, lease, land information, securities, information management and availability, credit facility, ownership, cognitive capacity, land rights, coordination
Dale et al. (2006)	Credit accessibility, demand, supply, cultural acceptance, transparency, social, environmental and economic sustainability, value, transaction cost, openness, accessibility, incentives, clarity, compensation
Ihlanfeldt (2007)	Competitiveness, land price, land value, self-interest, lot size, restriction
Wu (2008)	Erosion, desertification, land degradation, conflict, affordability, productivity, pollution, fragmentation, incentives
Cheshire and Vermeulen (2009)	Price, cost, benefit
Glaeser and Ward (2009)	Demand, supply, price
Williamson et al. (2010)	Mortgage, lease, land information, securities, information management, credit facility, ownership, expectations, land rights, coordination, information availability, taxation, compensation
Needham et al. (2011)	Transaction cost, expectations, prevalence laws, subsidies, hope value
Ciaian et al. (2012)	Land price, value
Monkkonen and Ronconi (2013)	Land price
Loxton et al. (2013)	Distrust, injustice, stress, dissatisfaction
Woestenburg (2014)	Land value
Alexander (2014)	Land price
Luca (2014b)	Land price, transaction volume
El-Barmelgy et al. (2014)	Proximity, social acceptance, price, demand, supply, land values, public interest, hazards
Copenheaver et al. (2014)	Land price, value
Mangioni (2014)	Compensation
Schirmer (2014)	Employment, identity, land availability
Lodin et al. (2015)	Coordination, local ownership, information technology
Government of Nepal (2015b)	Value, tax, subsidies, compensation, conflict, coordination, fragmentation, disaster, risk
Dirgasova et al. (2017)	Land price, lot size
Lees (2017)	Housing prices, affordability, supply, demand
Cheshire (2018)	Value, housing price, transaction delay
Faust et al. (2020)	Quality plots, open space, relocation of informal settlements, value, price, inadequate planning, affordability, data sharing, compensation, ad-hoc planning decisions

Some of the impact factors originating from the desktop review reveal their similar meanings in a broader context, despite differing terminology—such as ‘price’ or ‘land value’; ‘hazard’ or ‘risk’—whilst others were used interchangeably. To arrive at a standard set of impact factors, those presented in Table 2-1 were reclassified and allocated to the economic, environmental, social and institutional dimensions based on their degree of closeness to those dimensions. The distribution of the reclassified preliminary set of impact factors is shown in Figure 2-9.

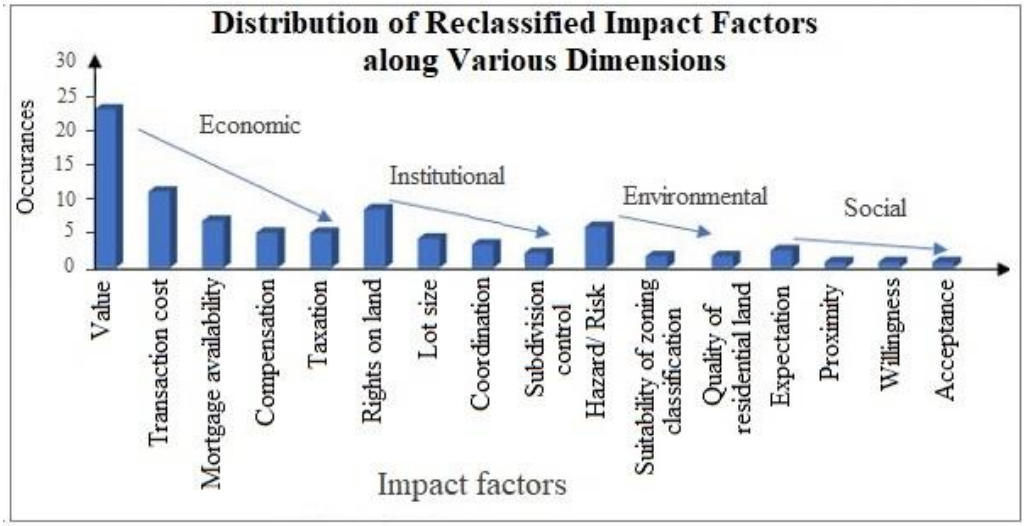


Figure 2-9: Reclassified impact factors acquired from the desktop review

The desktop review identified 16 land market impact factors across all dimensions with varying degrees of occurrence, as shown by the arrows. Land value, transaction cost, mortgage availability, compensation and taxation were identified as the land market impact factors across the economic dimension. Property rights, lot size coordination among stakeholders and subdivision controls were impact factors identified across the institutional dimension. Impact factors such as risk reduction, suitability of zoning classification and the quality of residential land were identified across the environmental dimension. Social expectations, the proximity to the planned location, willingness to support land use implementation, and acceptance of land use planning were found to be impact factors across the social dimension. Of the literature under review, impact factors across the economic dimension were rated highest—around 62% of total occurrences—whereas those across the social dimension were rated lowest, covering about 3% of total occurrences. Impact factors across the institutional and environmental dimensions had coverages of 20% and 15%,

respectively. When compared individually, the maximum occurrence of the reclassified land market impact factors was associated with the 'value' of land, a factor associated with the economic dimension of land market assessment.

Identification of generic impact factors does not represent the end of the impact measurement process. An applicable approach of impact identification is also essential, where those impact factors are utilised in the impact identification process. The following sections review the literature on the prevalent practices of land market impact assessment, identify the theoretical gap in impact assessment and then propose a new method of holistically assessing the impact of land use regulation on the land market in Nepal.

2.6. Land Market Impact Measurement Practices

The previous section identified a considerable body of literature that focuses mostly on the economic dimension of the land market—land price or value, and the demand and supply of land. Price variation studies usually follow a mathematical model to predict the effect of land use regulation on land prices (Ihlanfeldt, 2007; El-Barmelgy et al., 2014). Some of the studies have adopted a descriptive approach, using empirical data to reveal other changes such as delays in market processes caused by land use regulation (Dowall, 1992; Mayer and Somerville, 2000). Needham et al. (2011) also adopted a descriptive approach to reflect changes in transaction costs and expectations for stakeholders due to institutional changes such as land use regulation. However, Tuladhar and van der Molen (2003) followed a narrative approach to identify how psychological changes occur in customers when a new system is introduced in a land administration organisation. Dale and Baldwin (2000) adopted a quantitative approach in their case study to benchmark land markets in six eastern European countries under transition against the land market in the United Kingdom. However, few studies have been published that address the combined effects of various impact factors on the land market across the economic, social, institutional and environmental dimensions.

Recent innovations in land administration systems indicate 'change measurement' as one of the essential processes for making the system responsible. Recent study suggests that changes be explored based on eight indicators, 'the 8Rs'—responsiveness, resilience, robustness, reliability, respectedness, retraceability,

recognisability and reflexiveness—and across three aspects of the system—structure, process, and impacts and outcomes (de Vries and Chigbu, 2017; de Vries, 2021). Research also suggests that changes of policy intervention be explored by comparing achievements against the targets specified in the Millennium Development Goals (MDGs) or Sustainable Development Goals (SDGs) across multiple aspects, and to combine evidence with the perceptions of people (Zevenbergen et al., 2018). In the context of the current study, the synthesis of perception-based change measurements and documentary evidence can identify the impact of land use regulation on the land market across multiple dimensions, particularly the economic, social, environmental and institutional.

The challenge in framing these dimensions for identifying this impact is that stakeholders can have their own perceptions of the outcome of the land market across those dimensions. Stakeholders may have a vested interest in land and the outcomes accrued from it. Similarly, the market outcomes of introducing land use regulation may differ (positively or negatively) across various dimensions. Jaeger (2006) argues that interconnections between land use regulation, its effects and corresponding responses are dynamic and complex, and are difficult to disentangle. Such complexities make land market impact assessment more difficult.

Quantifying impact through a mathematical model that uses various impact factors requires identification of the relative importance of those factors. The quantification of impact is ineffective if there are incompatible criteria across multiple dimensions. However, a holistic evaluation should address multiple market outcomes, irrespective of their units of measurement or the nature of the outcome itself, whether quantitative or qualitative. This problem can be overcome by basing the impact assessment on the stakeholders' experiences and perceptions of land market outcomes. Ozdemir (2005) identified that people could make effective decisions through their cognition and personal judgement. argue that techniques that elicit expert knowledge can be applied to the identification of impacts; however, drawing conclusions about the impact based on judgement can be challenging if there are various criteria beyond the normal ranges of variation. A mathematically justifiable method of measurement that considers a range of criteria is essential for identifying the impact produced across each dimension by the associated land market impact factors across each dimension. The challenges

associated with perception-based land market assessment are in translating these perceptions into measurable quantities and then using them in the land market assessment framework.

Dale and Baldwin (2000) assessed the land markets in six European countries in transition, factoring 39 criteria associated with the components of the three pillars of the land market proposed by (Dale and McLaughlin, 1999). They identified the land market status through a score-based evaluation of land market outcomes, assigning equal weights to all factors. However, I found a plethora of literature on impact studies which adopted: weight-based multi-criteria decision-making (MCDM); environmental impact assessment (Ramanathan, 2001); evaluation of impact on water quality from changes in vehicular traffic caused by the broadening of highways (Banerjee et al., 2018); social impact assessment (Delgado et al., 2019); land suitability and urban growth modelling (Saxena and Jat, 2020). The common feature of the methods applied in these studies was in prioritising the corresponding variables by assigning them weights and combining those weights with sample evaluation rating collected from the field or data from other sources.

Depending upon the scale of ratings adopted and the way the weights are combined with the evaluation ratings, several subtypes of MCDM have been designed—for example, analytic hierarchy process (AHP), weighted rating method (WRM), Pugh's decision matrix, and Roy's ELECTRE III. Among these, AHP was the most distinctive alternative, with the highest degree of clarity of difference in scores compared to the other methods tested (Honkala et al., 2007). I also examined literature describing the use of other MCDM tools such as Delphi (Okoli and Pawlowski, 2004) and Grey clustering (Fusong and Zhaofeng, 2010; Sahoo et al., 2016). Delphi analysis needs a substantial period of time to reach a common point of understanding because it is carried out through iterative individual interactions with each selected domain expert. In Grey clustering, field-collected evaluation ratings are transformed by the mathematically modelled functions (Delgado et al., 2019), with a risk of over-modifying the evaluated ratings. Olabanji and Mpofu (2014, p. 268), in their comparative study, also concluded that AHP produces a detailed result compared to the weighted decision matrix (WDM) technique. Based on a review of 45 articles from 33 journals on applying the various MCDM techniques in the automotive industry,

Castro and Parreiras (2018) concluded that AHP proved to be the most consistent technique among the 30 different techniques identified.

AHP is a structured technique designed to select the best alternatives by organising and analysing complex decisions based on mathematics and psychology (Ozdemir, 2005; Bernasconi et al., 2010). The power of AHP lies in its capability to comparatively assess several hierarchical factors of varying weight associated with multiple criteria in a given evaluation study. Dey (2002) adopted AHP to identify the performance level of four Caribbean organisations by combining the weights of the critical success factors with the sampled performance outcomes acquired through discussions with local experts. Based on the literature review and considering the applicability of AHP to the quantitative impact assessment in studies relating to multi-stakeholder multi-criteria decision making (MSMDM), I decided to apply AHP to the stakeholder assessments of the land market.

An assessment solely based on stakeholders' perspectives may not be adequate for confirming the impact of land use regulation on the land market as it only represents their own views. It may result in multiple distinct sets of opinions regarding this impact. Such impact measures depend on each stakeholder's engagement, role, stake and interest in the land market, and may therefore be accepted as multiple realties. The theory behind subjective ontology assumes multiple realities and allows us to account for multiple views (Saunders et al., 2015). However, these views must be supported either by the reality on the ground or by documentary evidence. Dale and Baldwin (2000) analysed factual land market data to support experts' viewpoints in benchmarking land markets in six eastern European countries. Dey (2002) also utilised actual data on the performance of organisations to support experts' viewpoints. The literature review suggests that the subjective views of the 'participants' must be realised or corroborated by objectively observed information. Lees (2017) adopted the objectivity-based methods of assessing the impact of land use regulation by comparing data before and after land use regulation had been introduced. A holistic impact assessment of the land market may be conducted through the subjective analysis of stakeholders' perspectives using AHP and its findings, supported and complemented by the documentary evidence of the changes in the land market under study.

2.7. A Theoretical Gap in Land Market Assessment

The literature review indicated that a land market, being a composite mechanism of several components, cannot be wholly assessed through a single theoretical lens. Land administration theory supports the establishment of the theoretical relationship between land use and the land market. It can be used to identify limited impact areas in a broader economic and institutional context, such as land value and mortgage availability. Neoclassical economic theory provides a theoretical basis for analysing the value of and demand for land; however, it does not address the social aspect of stakeholders' expectations of the outcome of policy intervention. New institutional economic theory addresses property rights issues and considers compensation and negotiation as part of the implementation process. Transaction cost theory addresses the issues of transaction cost. These theories in isolation are not sufficient for holistically identifying the impact of land use regulation on the land market; they therefore leave a gap in assessments of the impact of land use regulation on the land market. A solution for filling this gap is to consider multiple theoretical underpinnings for impact assessment.

With multiple theories considered, the land market can be holistically and conceptually assessed across multiple dimensions. However, the consideration of multiple dimensions, impact factors and stakeholders make such an assessment complex and raises the question of what process should be used to identify the impact and how to represent it. Because the prevalent land market assessment mechanism cannot be used to holistically measure the impact of land use regulation on the land market, a new and original approach to impact assessment is required. This study endeavours to fill the gap by measuring the impact of land use regulation on the land market in Nepal across the economic, social, environmental and institutional dimensions through the application of AHP and documentary evidence.

Assessing the impact of land use regulation on a land market requires two fundamental conditions: (i) the jurisdiction must have a system of land use regulation in place that can control the use of land, and (ii) it should have an operational land market on which the assessment is conducted. The next chapter will present a review of land use regulation and the land market in Nepal, which will determine whether the identified

approach can be applied for assessing the Nepalese land market in the context of land use regulation being introduced there.

2.8. Chapter Summary

This chapter explored the literature on identifying the theoretical relationship between land use regulation and the land market in Nepal. It explained the impact assessment in the context of sustainable development and the emerging innovative concept of responsible land administration. The chapter discussed land administration theory, economic theories, transaction cost theory and urban land market theory in order to identify whether the land market can be assessed holistically by any single theory. The theoretical gaps were identified, and a preliminary set of land market impact factors was identified across the economic, social, environmental and institutional dimensions. The last section of the chapter presented examples from the literature to explore the prevailing impact assessment practices for measuring the impact of land use regulation on the land market in Nepal. The outcome of this review suggested that a practical and pluralistic approach should be adopted that would employ a combination of methods: subjective methods of impact assessment based on stakeholders' perspectives and objective methods of impact assessment based on the quantitative data collected through documentary evidence. This chapter answered the first research question and achieved the first research objective. The next chapter will review the land market and land use situation in Nepal and establish the relevance of applying the assessment method identified in this chapter.

Chapter 3: Land Use Regulation and the Land Market in Nepal

3.1. Introduction

The previous chapter reviewed the literature to explore the theoretical background for measuring the impact of land use regulation on the land market. It also identified land market impact factors and prevalent practices of land market assessment. Based on this literature, various land market impact factors were identified across the economic, social, environmental and institutional dimensions.

This chapter discusses the process of implementing recent land use regulation in Nepal before detailing the major components of the land market in Nepal. At the outset, it provides a brief introduction to the geographic and socioeconomic situation of Nepal. It then discusses the land use regulation, land use planning, land zoning systems in Nepal, including some of the provisions of the *Land Use Policy 2015* implemented in the country. The chapter finally discusses the land market in Nepal though the perspective of the three-pillar land market model. The chapter covers the institutional framework to support land use regulation and the land market in Nepal.

3.2. Geographic and Socioeconomic Context in Nepal

This section briefly presents the geographical and historical overview of Nepal. It discusses population growth and migration as factors putting pressure on land use in the country. This section also presents the economic situation of Nepal, and compares the contribution of the agricultural, non-agricultural, and real estate sectors in the national economy.

3.2.1. Geographical and Historical Overview

Nepal is a landlocked country sandwiched between the People's Republic of China to the north and India to the east, west and south (Figure 3-1). The country covers an area of 147,181 km^2, of which 83% is mostly covered by mountains and valleys. The longest Himalayan mountain range runs along the northern boundary of Nepal; the world's tallest mountain, Mt Everest, stands there at 8848 metres. The southern part

of the country is covered by a fertile belt of plains that extends from east to west along the southern border with India (Government of Nepal, 2018b). Kathmandu, the capital city of Nepal, lies in the Kathmandu Valley. The Kathmandu Valley includes Kathmandu, Bhaktapur and part of Lalitpur district, and is approximately located in the central mountainous areas of Nepal.

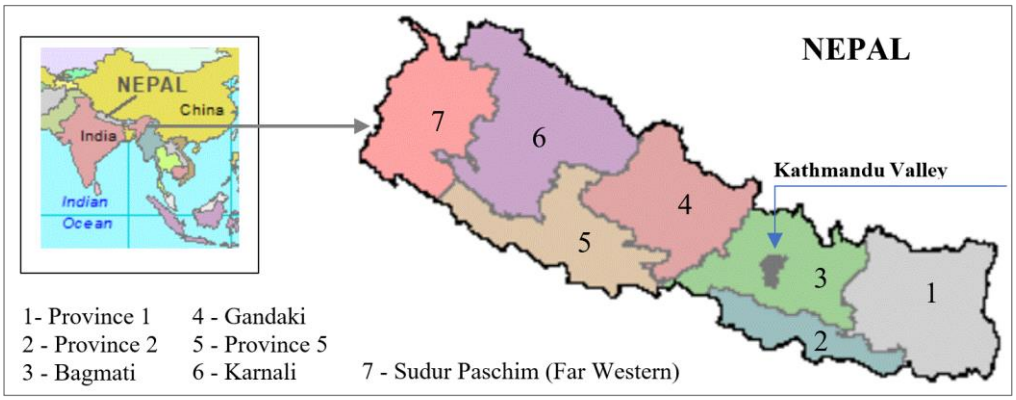


Figure 3-1: Geographic location of Nepal
Source:Government of Nepal (2020)

Historical records indicate that the Gopalas and Mahishapalas were the earliest rulers of the Kathmandu Valley, the present-day capital of Nepal. In 800 BC, the Gopalas and Mahishapalas were overthrown by the Kirantis. At around AD 300, the Lichchhabis came to power and ruled the state for around 900 years. In AD 1200, the Mallas started ruling the valley for around 550 years. In the mid-18th century, Prithvi Narayan Shah, the king of the state of Gorkha, established the nation as Nepal (Government of Nepal, 2018b).

The modern country of Nepal was formed by King Prithvi Narayan Shah and his successors through the unification of minor states between the mid-18th century and the early 19th century (Paudel et al., 2013). The Shah royal dynasty that had ruled Nepal for 240 years was removed from power through a people's movement and Nepal was declared a Federal Democratic Republic by the Constituent Assembly in 2008. The second Constituent Assembly formed by the general election in 2015 promulgated the *Constitution of Nepal* (Government of Nepal, 2017a), which administratively restructured the country into seven provincial states and 77 districts.

Its geographic character as well as rapid changes in its political environment have affected how people use land in Nepal. The impact of Nepal's geographic

characteristics can be directly observed by differences in land use patterns between hilly areas and fertile plains. The prolonged political conflict for the restoration of democracy not only created differences in the management of resources across the country but also affected the distribution of the population.

3.2.2. Population

The current population of Nepal is approximately 30 million (Central Bureau of Statistics Nepal, 2021). The national census data collected every decade shows a growing population (Figure 3-2). The annual growth rate of Nepal's population during the intercensal period of 2011–2021 was 1.37% (UNFPA Nepal, 2017). There is an uneven distribution of the population across rural and urban areas. The urban population density is 1381 people per square kilometre, compared with a population density of 180 per square kilometre at the national level (CBS, 2012; Bakrania, 2015b).

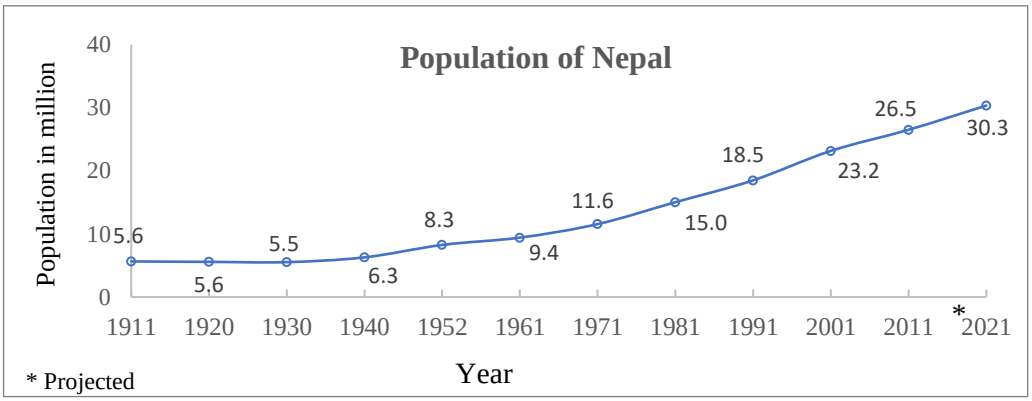


Figure 3-2: Population of Nepal
Source: (Sharma, 2003; CBS, 2012, 2021)

Nepal is one of the ten least urbanised countries in the world. However, it has also been reported to be one of the most rapidly urbanising countries, with a projected annual urbanisation rate of 1.9% (Bakrania, 2015b) and the number of municipalities increasing from 58 in 2001 to 293 in 2017 (Figure 3-3). However, urbanisation experts observe that the population size was the only criterion used in declaring urban centres in Nepal (Muzzini and Aparicio, 2013). Issues such as infrastructural development and the density, contiguity and occupational structure of the population were little considered and are less correlated with economic growth (UNFPA Nepal, 2017).

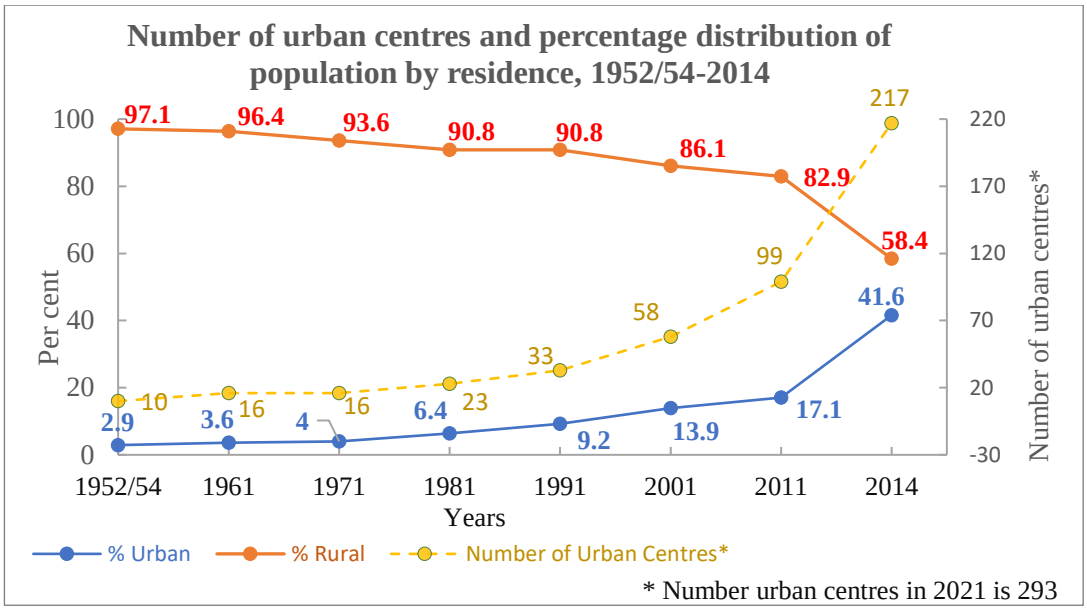


Figure 3-3: Rural and urban population and number of urban centres in Nepal

Source: (UNFPA Nepal, 2017)

The urban population of Nepal is increasing rapidly, along with the gradual decline in its rural population. The former increased from 4% in 1971 to approximately 42% in 2014 (UNFPA Nepal, 2017) (Figure 3-3). The total urban population increased from 0.46 million in 1971 to 11 million in 2011 (including the population of 58 municipalities)—almost a 24-fold increase (Chapagain, 2018). Kathmandu Metropolitan City is the densest city in Nepal, with 24.3% of the country's total urban population (CBS, 2012). Kathmandu Valley's five urban areas—Bhaktapur, Kathmandu, Kirtipur, Lalitpur and Madhyapur-Thimi—cover nearly one-third of the national urban population and nearly three-fifths of the valley's population. At over 58%, the valley's urban population is much greater than the national urban average of 17.1% (Pradhan et al., 2020). Kathmandu Valley is the fastest-growing urban population in Nepal and has experienced the largest net inflow of urban migrants (Muzzini and Aparicio, 2013).

3.2.3. Economy

Situated between India and China, two giant world economies, Nepal has remained one of the least developed countries in the world. Its economy is largely based on agriculture, remittances and tourism. The poor economic situation of Nepal is reflected in its average per capita GDP, which was approximately US$1060 for the 2019–20

fiscal year (Nepal Rastra Bank, 2020b). Economic growth has largely been low and volatile in Nepal, mostly stagnating at around 5.6% ,with the lowest growth of 0.6% in the 2015–16 fiscal year and the highest growth in the period July 2016 – July 2017 within the six year period as shown in Figure 3-4 (Nepal Rastra Bank, 2019d, 2020b).

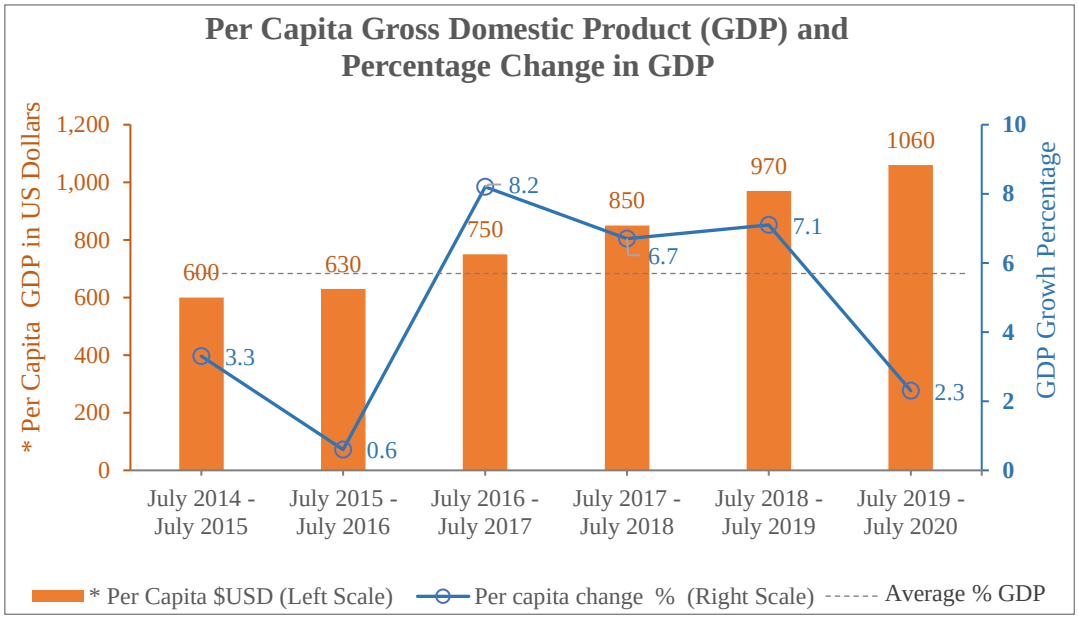


Figure 3-4: GDP of Nepal in terms of percentage, and per capita

* Calculation based on the prevalent price assuming US $1 equivalent to NRs 125 and average population of Nepal at 28.5 million for the entire period. Data source: Monetary Policy of the Fiscal Year July 2019–July 2020, Nepal Rastra Bank, Nepal

The lowest percentage during 2015–16 reflects the aftermath of the earthquake in 2015. Nepal received NRs 410 billion (approximately AU$5.0 billion) in international support to cope with the abject situation created by this disaster (National Reconstruction Authority, 2019). In 2016, the Constituent Assembly of Nepal passed a new constitution (Government of Nepal, 2015a) and there was a gradual growth in economic activity, as seen in 2016–17. Around the end of the 2016–17 fiscal year, the Government of Nepal enforced land classification and introduced subdivision restrictions (Government of Nepal, 2017b). Although per capita GDP showed a gradual growth in Nepal, there was a slight decrease in the percentage of GDP growth after the subdivision restriction, which could be the subject of a separate study. A sudden drop in GDP to 2.3% during July 2019–July 2020 can be attributed to the situation created by the spread of the COVID-19 pandemic, when the country went into lockdown during the last quarter of the fiscal year.

Agriculture is the mainstay of the Nepalese economy and supports the livelihood of almost three-quarters of the population (Nepal and Marasini, 2018). However, a review of the data from the Federal Reserve Bank showed that the agricultural sector contributed approximately 31% to GDP in the 2019–20 fiscal year (Figure 3-5). During the same period, non-agriculture sectors such as industry, tourism and education (excluding real estate, rental and related business) contributed approximately 62% to GDP. The contribution of real estate, rental and related business was around 7% that same period (Nepal Rastra Bank, 2020b).

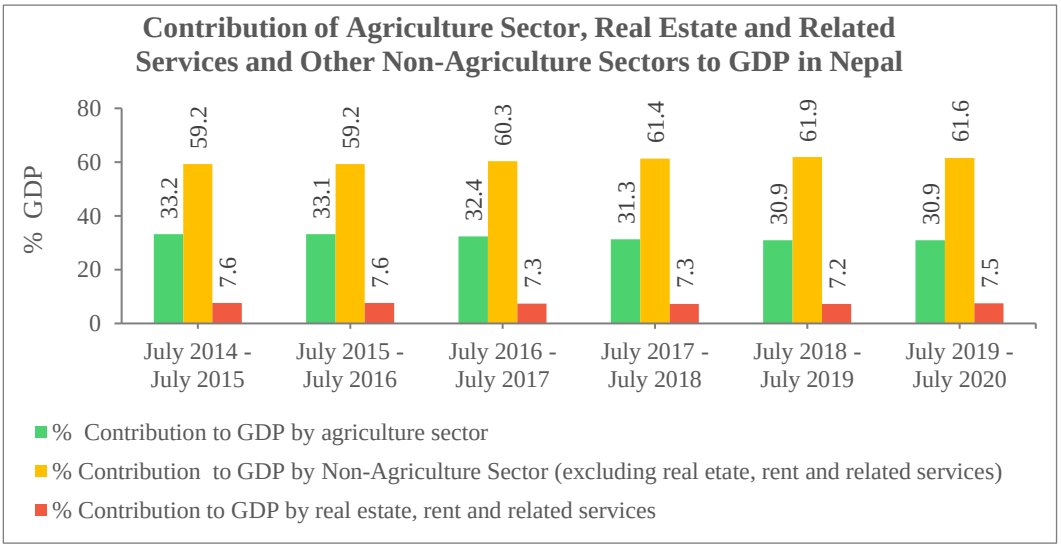


Figure 3-5: Share of agriculture, real estate, and other non-agriculture sectors in GDP

Data source: Monetary Policies of fiscal years 2019, 2020, Nepal Rastra Bank

Nepal has a high potential in hydropower, with an estimated 82,000 MW of commercially feasible capacity (Gunatilake et al., 2020). However, a complex topographic structure, recurring natural disasters, insufficient human resources, poor planning and political uncertainty have hindered the country's utilisation of its existing resources, as seen by the scant quantity of hydropower being produced (approximately 1300 MW) by 2020 (Nepal Rastra Bank, 2019c). A low level of energy production, inconsistent electricity supply and underdeveloped transport infrastructure have been affecting the country's economic growth. The situation also hampered foreign direct investment (FDI) in Nepal, as revealed by the total FDI stock of NRs 200 billion by 2017–18, with the highest net amount of NRs 17.51 billion in the same fiscal year (Nepal Rastra Bank, 2019f).

3.2.4. Migration

In Nepal, migration has been found to be more of a necessity than a choice for the survival of families or individuals (UNFPA Nepal, 2017) and is the largest contributor to urban growth and economic support in the country (Muzzini and Aparicio, 2013). Most of Nepal's internal migration occurs from the hills to the Southern Plain of Terai, and from rural to urban areas. People migrate from rural to urban areas for security reasons and to enjoy better facilities and opportunities. A large number of people who felt insecure in the villages migrated to the Kathmandu Valley during 1996–2006, a period of armed conflict in Nepal (Upreti et al., 2017). Of the total migrants in the Kathmandu Valley, 77% are from rural areas, 5% are from abroad and 19% are from other urban areas (Kathmandu Valley Development Authority, 2015b).

While internal migration has contributed to the expansion of urban centres in Nepal, overseas migration has remained an important source of employment for Nepalese communities, mostly from rural areas. A lack of job opportunities (push factor) at home and high pay abroad (pull factor) have been contributing factors to immigration from Nepal (Sapkota, 2013). Since the 2015–16 fiscal year, the number of labour approvals granted to Nepalese to work abroad has remained around 400,000 per annum, although it is decreasing with the government's strict policy on granting approvals to females to work abroad due to safety and security concerns (Figure 3-6). The number of Nepali workers engaged in foreign employment was approximately 4.6 million in mid-2019 and 4.8 million by mid-2020 (Ministry of Finance, 2020, p. 63).

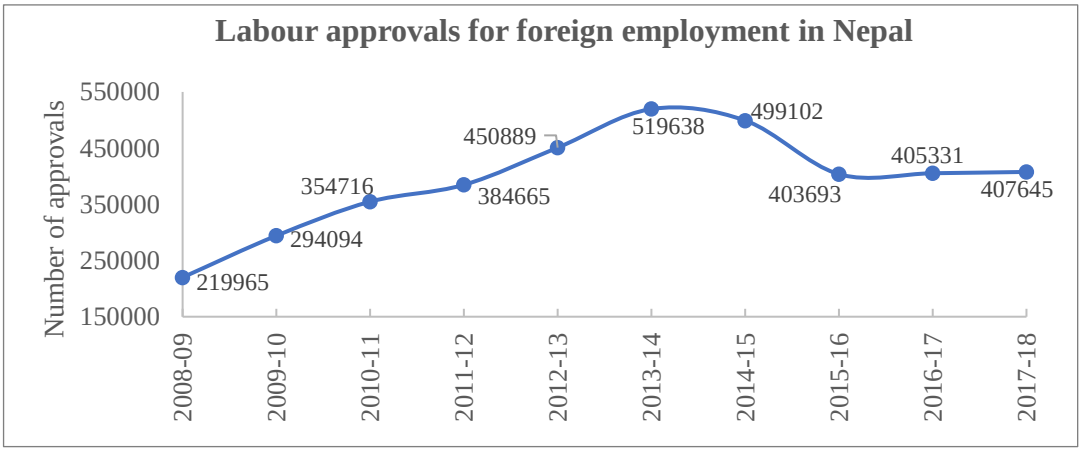


Figure 3-6: Labour approvals for foreign employment in Nepal
Source: (Department of Foreign Employment, 2020)

A high level of emigration for employment purposes resulted in an unprecedented level of remittance inflows to Nepal (Sapkota, 2013). The total amount of remittance inflows to the Nepalese economy increased from NRs139 billion in the 2007–08 fiscal year to NRs 6540 billion in 2018–19 (CBS, 2017, 2018). Although remittances are negatively associated with international trade, they are positively associated with financial development (Dahal, 2014). This is reflected in the fact that the ratio of remittances to GDP in Nepal changed from 1.3% in 1995 to 25.4% in 2019 (Nepal Rastra Bank, 2019a).

Remittance inflows have had a significant impact on land use change in Nepal and are considered a factor in promoting investment in the land and real-estate sector, whereby cheap credit from the BFIs resulted in a real estate boom (Sapkota, 2013; Nepal Rastra Bank, 2016c). Increasing demand for residential land in the urban areas of Nepal has been attributed to rural–urban migration (KC et al., 2017), which was further fuelled by the inflow of remittances through foreign employment (Ghimire, 2015). This has resulted in a very high degree of fragmentation of fertile land in Nepal for the purpose of residential use (Paudel et al., 2013; Upreti et al., 2017).

3.3. Land Use Regulation in Nepal

3.3.1. Historical Overview of Land Use Regulation in Nepal

The concept of land use management is specified in the famous ancient Hindu scripture of Bhagwat that describes the governance of the Hindu king Prithu who regulated land classification by designating areas for residential, agricultural and pastoral purposes (Bhagwat, 2017 , Text 30-32, Chapter 18, Section 4). Historical evidence suggests that the concept of managing land on the basis of its use began in Nepal in the Lichchhabi era at around AD 300. (Dawadi, 2018). The concept of the use of land according to its suitability prevailed in the early period of modern Nepal, as evidenced by the archives of the late King Prithvi Narayan Shah, which reads:

> Even if there exists a mine underneath a village, displace the village and operate mining; shift the house built on a fertile land and cultivate the land through irrigation by constructing canal; export domestic herbal products to foreign land and draw cash out of it (Government of Nepal, 2012, p. 1).

The Civil Code of Nepal first introduced by the late King Surendra Shah mandated several land management provisions introduced around AD 1853 (Government of Nepal, 2012).

3.3.2. Evolution of Land Use Policy in Nepal

In modern Nepal, land classification began with the introduction of the land reform program in 1963 (Acharya, 2008). At the same time, the government established the land registration system using cadastral surveying, managing the land records at the district land revenue and survey offices. This established the basic infrastructure to begin the formal land market processes in Nepal. Cadastral surveying commenced in 1964, through the *Land (Survey and Measurement) Act 1963*, and land was classified in terms of the productivity of food crops: Abal was the first grade; Doyam, the second grade; Sim, the third grade; and Chahar, the fourth grade (Tuladhar, 2004; Acharya, 2008). The act, however, mentioned nothing about the suitability of land for other non-agricultural purposes such as residential, commercial or industrial use.

The Government of Nepal also initiated forest conservation by mapping forest areas in the country. Attempts were made to prevent encroachment into forest areas through the introduction of the *Forest Act 1961*. Initiatives for the protection of pastureland were also taken by introducing the *Pasture Land Nationalization Act 1974*.

With the objective of establishing systematic settlement, the Government of Nepal introduced the *Town Development Act* in 1988. The government commissioned the Kathmandu Valley Development Authority in 2012 to support the management of land in the valley. These institutional initiatives provided a mechanism for commencing a residential land development program through land pooling throughout Nepal, mostly in the Kathmandu Valley (Karki, 2004). However, forests and cultural areas were continually encroached in spite of strict laws (Government of Nepal, 2012). Agricultural areas were being used haphazardly in the country and, consequently, the government introduced the concept of zoning-based land classification (Agricultural, Commercial and Residential zones) through the Eighth Amendment of the *Land (Survey and Measurement) Act* and implemented through the *Land (Surveying and Mapping) Regulation 2000*. However, the classification was carried out in areas covered by cadastral resurveying and was based on the judgement of the cadastral

surveyors rather than objective land evaluation methods prescribed in the regulatory document.

The limited land classification prevalent at the time proved to be inadequate in addressing other land use issues such as land fragmentation and haphazard land development fuelled by rapid population growth and internal migration from rural to urban areas in the country (KC et al., 2017; Upreti et al., 2017). There were no restrictions regarding the use of privately purchased land, which resulted in increased investment in land, particularly for residential development (Paudel et al., 2013; Nepal Rastra Bank, 2016c). The growing and uncontrolled development of urban and peri-urban land resulted in increased land fragmentation, raised concerns about the loss of agricultural land and hence food security (Government of Nepal, 2012), and led to congested urban settlements, a lack of open space, and high levels of environmental pollution (Government of Nepal, 2007, 2012). To address these problems, the Nepalese government introduced the *National Land Use Policy 2012*.

However, at the time the government was preparing to implement this policy, Nepal suffered catastrophic destruction from a major earthquake in 2015. The issue of resettlement of earthquake victims was advanced at the national level, as the *National Land Use Policy 2012* did not explicitly address such resettlement issues. As a result, the Government of Nepal replaced the policy with the new *Land Use Policy 2015* (Government of Nepal, 2015b).

The new land use policy extended the land classification system to eleven different zones from the previously defined six and mandated the compulsory delineation of hazard areas on the land use map. The policy also specified implementation strategies such as standards for roadways, subdivision control and land pooling. The government intended to settle political issues after a comprehensive peace accord with the Communist Party of Nepal (Maoist) (National Legislative Bodies/ National Authorities Nepal, 2006; Alexander et al., 2009), so the enactment of land use control was held in abeyance due to other priorities (Stein and Suykens, 2014). This postponement of the enactment process further delayed the control of agricultural land fragmentation in Nepal (Upreti et al., 2017). In 2017, the government issued a ministerial decree to enforce the restrictions on the recursive subdivision of agricultural land throughout the entire country (Government of Nepal, 2017b). This

decree created widespread dissatisfaction among real estate agents and private land developers, resulting in litigation against the government. However, the High Court upheld the government's decision and directed the continuation of restrictions until the enactment of a land use act (Rimal, 2018). Subsequently, the Government of Nepal introduced the *Land Use Act 2019* (Government of Nepal, 2019). The current act mandates the hierarchical execution of land use regulation at the national, provincial and local levels.

3.3.3. Land Use Planning and Mapping in Nepal

In 2000, the Government of Nepal established the National Land Use Project (NLUP) with the objective of producing a land use and zoning map of the entire country (Government of Nepal, 2012). The project was placed under the supervision of the National Land Use Council formed by the National Planning Commission. The Land Use Council formed the Inter-Ministerial Land Use Mapping Technical Committee to oversee the technical matters of land use mapping. The NLUP initially produced prototype land use maps of different ecological regions by using low-resolution satellite images. Following the introduction of the *National Land Use Policy 2012* and its revision in 2015, technical standards were defined for land use mapping and zoning in the country (National Land Use Project, 2015).

By 2016, the project had completed around 50% of the land use mapping in the country, including the entire southern plain as well as most of the Kathmandu Valley. In 2017, the government dissolved the NLUP: the Topographical Survey and Land Use Management Division (TSLUMD) under the Survey Department was then assigned to complete the land use mapping, which was achieved in 2021. The division has already started to deliver the maps and data to local bodies for implementation.

Apart from the preparation of land use maps, the Survey Department also manages cadastral records and updates them during each land transaction. The maintenance of up-to-date cadastral maps is ensured by a cadastral survey office located at the district level. Land registration records are maintained by the Department of Land Management and Archive through the district-level land revenue offices (Ministry of Land Management Cooperatives and Poverty Alleviation, 2019). The Department of Urban Development and Building Construction (DUDBC), located under the Ministry

of Urban Development, coordinates the preparation of urban plans with the local agencies (Kathmandu Valley Development Authority, 2015a). The Kathmandu Valley Development Authority, which is the modified version of the Kathmandu Valley Town Development Committee (KVTDC), manages the preparation and implementation of urban plans in the Kathmandu Valley (Tiwari, 2015). Each local governing body (municipality) constitutes its own Town Development Committee to administer urban planning within its jurisdiction. This means that the implementation of land use regulation is not limited to a single organisation in Nepal. However, it lacks a coordination mechanism, as identified in the land policy documents introduced at various periods.

According to the *Land Use Policy 2015*, the then Ministry of Land Reform and Management (whose name was later changed to the Ministry of Land Management, Cooperatives and Poverty Alleviation) is the main body responsible for land management issues at the institutional level. The policy mandates the establishment of a land use management department and division offices to implement and monitor land use regulation in Nepal. The policy also specifies the establishment of Coordination and Implementation Committees to ensure the effective implementation of the policy (Government of Nepal, 2015b). However, these organisational structures are yet to be implemented at the time of writing.

3.3.4. Land Zoning in Nepal

The *National Land Use Policy* of 2012 and 2015 mandates land classification into multiple zones (Government of Nepal, 2015b). Land use zoning in Nepal is based on interpretative analysis of the agricultural capability of land. Land capability is identified by analysing various data such as the suitability of land for specific usage, arability, climatic regimes, soil characteristics, soil drainage patterns, geomorphology and hazards, and other socioeconomic and environmental factors (National Land Use Project, 2015). The data is collected at the local level as well as through satellite images of the area being mapped. A detailed analysis of land capability, hazard conditions, the present land use patterns as well as the local socioeconomic situation helps to classify different land zoning units. The zoning layer is then superimposed onto a cadastral map of the area in a GIS environment to assign each cadastral parcel to a distinct land zone (Figure 3-7).

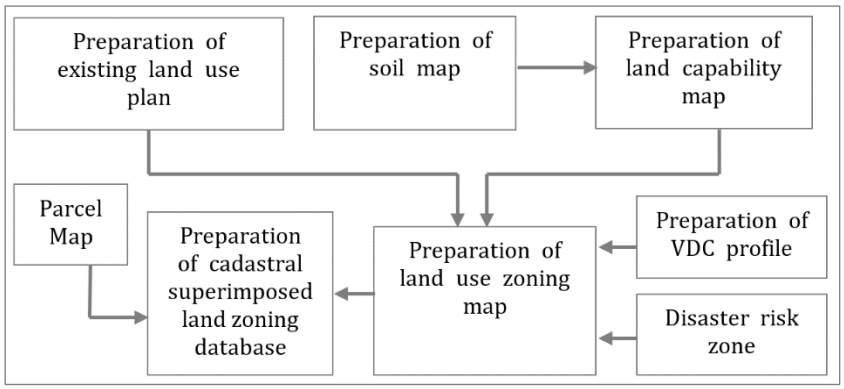


Figure 3-7: Land zoning process in Nepal

Source: Manandhar and Subedi (2019, p. 383)

However, the zoning map prepared at the national level has not been implemented by local governing bodies, mostly due to a lack of skills in utilising these maps. Owing to the delay in implementation, the maps need updating and revision to reflect changes in administrative boundaries. Despite the existence of these national land zoning maps, the federal government enforced its subdivision restrictions based on the classification scheme defined by the previous *Land (Survey and Measurement) Act 1964* to control the rampant fragmentation of agricultural land (Government of Nepal, 2017b). This classification was meant for the purposes of taxation and revenue collection and does not address present land use requirements.

The Kathmandu Valley Development Authority produces Risk Sensitive Land Use Plans of urban areas within the valley (Kathmandu Valley Development Authority, 2015b). It has produced its own implementation plan, of which other stakeholders may not be aware due to poor coordination. Similarly, the *Self-Governance Act 1988* and the *Town Development Act 1988* mandate that local bodies implement self-developed land use plans within their jurisdictions.

The *Land Use Policy* of Nepal mandates a separate department to implement and manage of land use regulation and specifies the coordination mechanism to be established at the national level. The *Land Use Act 2019* mandates a coordination council at the local level. However, the organisational framework for implementing land use regulation did not have any coordination mechanism except in the land readjustment program run by KVDA and local governing bodies. The overlapping of roles and responsibilities of institutions and the lack of coordination among

government agencies creates zoning uncertainty and thus negatively affects the sustainable management of Nepal's land (Nepal et al., 2020).

3.3.5. Policy Provisions and Implementation

The Government of Nepal specifies the *Land Use Policy* as the master policy; therefore, any policy that addresses land management should align with the *Land Use Policy 2015*. Both the 2012 and 2015 versions of this policy address broader areas of land management across economic, social, environmental and institutional dimensions. The policy provides guidelines across sectors such as urban development, the protection of agricultural land and forests, soil conservation, risk management and environmental protection, and the conservation of socio-cultural areas. The policy suggests several tools and strategies that can be utilised to implement land use regulation. However, exploring all of these guidelines, strategies and tools would not be practicable within the scope of this study. Further, the emphasis given in this study was across those implementation activities that would have changed Nepal's land market.

The *National Land Use Policy* also specifies strategies for forming coordination mechanisms, awareness-raising, establishing parcel-based valuation and taxation, including land use planning in the academic curriculum, and establishing of a land use information system in the country. However, no literature was found that addressed the implementation of these strategies, which are yet to be realised. Apart from several strategies specified in the *National Land Use Policy* of Nepal, few strategies have been implemented which have influenced the Nepalese land market (Government of Nepal, 2015b) (Table 3-1).

Table 3-1: Implementation strategies specified in the *Land Use Policy 2015* of Nepal

Provisions in *Land Use Policy 2015*	**Article and sub-article**	**Reviewed documents**
Land use classification	1/5	(Government of Nepal, 2012, 2015b; Kathmandu Valley Development Authority, 2015a;b; Government of Nepal, 2017b; Kathmandu Valley Development Authority, 2017; National Reconstruction Authority, 2017; Dakshinkali Municipality, 2018; Godawari Municipality, 2018; Government of Nepal, 2019; National Reconstruction Authority, 2019)
Subdivision restriction	5	
Expansion of right-of-way	9(1),10(4)	
Execution of resettlement program	1/5	
Risk zone identification and safety measures	1, 10(1), 6(1), 6(5)	
Lot size control	5(4)	
Land pooling	6(4)/ 9(5)	
Penalties for misuse or no use of land	9	

3.3.5.1 Land Classification

The *Land Use Policy 2015* specifies eleven different land use categories for land use mapping in Nepal. However, in 2017, Nepal's government reinforced the land categories defined by the *Land (Survey and Measurement) Act 1964* which enforced land classification based on agricultural productivity and which had been introduced for taxation and revenue collection in 1964. In 2019, Nepal enacted the *Land Use Act 2019*, which defines ten different land use categories with minor modifications of definitions in the *Land Use Policy 2015*. Table 3-2 details the land use categories in the various statutes.

Table 3-2: Land use categories specified in different legal documents

<table>
<tr><th rowspan="2">Land Use Act 2019</th><th rowspan="2">Land Use Policy 2015</th><th colspan="2">Land (Survey & Measurement) Act 1964</th></tr>
<tr><th>Cadastral resurveyed area</th><th>Other areas</th></tr>
<tr><td>Agricultural Zone</td><td>Agricultural Zone</td><td rowspan="2">Agricultural area</td><td rowspan="2">Dhanahar or irrigated land in Terai region with the highest to the lowest level of rice productivity (Abbal, Doyam, Sim, and Chahar)</td></tr>
<tr><td>Residential Zone</td><td>Residential Zone</td></tr>
<tr><td>Commercial Zone</td><td>Commercial Zone</td><td rowspan="3">Commercial or Residential area</td><td rowspan="3">Bhit or non-irrigated land in Terai with the highest to the lowest level of agricultural capability (Abbal, Doyam, Sim, and Chahar)</td></tr>
<tr><td>Industrial Zone</td><td>Industrial Zone</td></tr>
<tr><td>Forest Zone</td><td>Forest Zone</td></tr>
<tr><td>Mining and Minerals</td><td>Mining and Minerals</td><td rowspan="2"></td><td rowspan="2">Khet or rice lands in other regions with the highest to the lowest level of agricultural capability (Abbal, Doyam, Sim, and Chahar)</td></tr>
<tr><td>Cultural and Archaeological</td><td>Cultural and Archaeological</td></tr>
<tr><td>River, Rivulets, Lakes and Wetland</td><td>Riverine and Wetland</td><td rowspan="3"></td><td rowspan="3">Pakho or non-irrigated land with the highest to the lowest level of agricultural capability (Abbal, Doyam, Sim, Chahar, and the fifth grade)</td></tr>
<tr><td>Public Use Zone</td><td>Public Use and Open Area</td></tr>
<tr><td>Other zones designated by the Government as necessary</td><td>Construction Material (Soil and Rocks) Excavation area</td></tr>
<tr><td></td><td>Other specified zones</td><td></td><td></td></tr>
</table>

3.3.5.2. Subdivision Restriction

In 2017, the Government of Nepal enforced subdivision limitations on agricultural land throughout the country as per the scheme listed in Table 3-2. The restrictions placed the implementing agencies in a difficult position as there was no up-to-date land use information to which to refer to successfully implement these subdivision restrictions.

3.3.5.3. Expansion of Roadways

Despite efforts to apply better land management, urban areas in Nepal have experienced ad hoc development characterised by unplanned housing, pollution, road congestion and uncontrolled changes in land use (Shrestha, 2015; Faust et al., 2020). Road expansion works through the Guided Land Development Program, initiated by the Kathmandu Valley Town Development Committee (KVTDC) to improve traffic congestion, could not progress because of the challenges arising from compensation and property rights. Realising that traffic conditions in the Kathmandu Valley were worsening, the government dissolved the KVTDC and established the autonomous Kathmandu Valley Development Authority (KVDA) in 2014 (Tiwari, 2015). Although the objective of the road expansion works represented a positive step in the eyes of the wider public, it created widespread dissatisfaction among those landowners who contributed their land for the road works.

3.3.5.4. Disasters and Risk Reduction

e *Nepal Disaster Report 2017* identified Nepal as exposed to a variety of natural hazards and human-induced disasters. More than 80% of Nepal's total population is at risk from natural hazards such as floods, landslides, fires and earthquakes (Ministry of Home Affairs, 2017). Excluding the damage and human loss caused by earthquakes and epidemic diseases, the cumulative statistics show that the number of houses destroyed by floods in Nepal is greater than those destroyed by other disasters over 1971–2018 (Figure 3-8). The data also shows that a similar number of deaths were caused by landslides and floods.

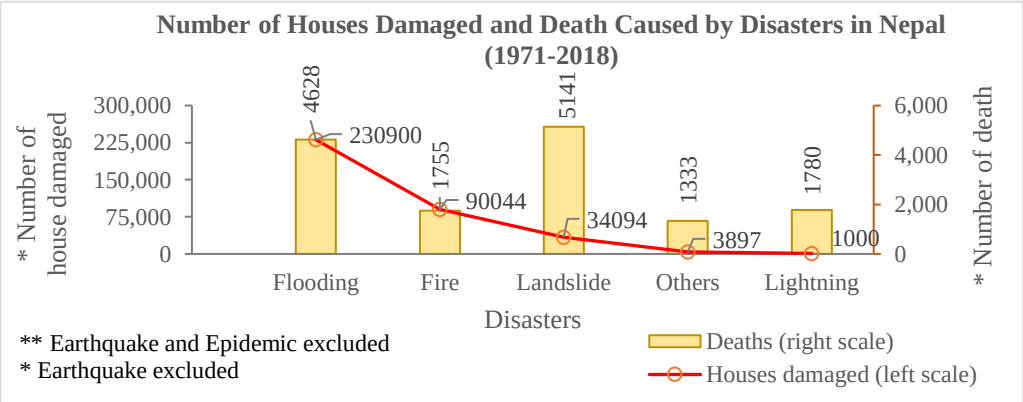


Figure 3-8: Number of houses damaged and deaths due to various disasters
Source: Ministry of Home Affairs (2019)

Literature relating to the multi-hazard risk study of Kathmandu Valley showed that the densely populated areas, old settlements and the central part of the valley are at very high risk from multiple hazards, particularly earthquakes, flooding, fire and landslides (Khatakho et al., 2021). Owing to the increasing demand for land by the increasing population of the Kathmandu Valley, its urban areas are continuing to sprawl towards the foothills (Rimal et al., 2017). Population growth has contributed to increased human activity in areas at risk of flooding, landslides and fire, and close to seismic faults. Factors related to human intervention have contributed to exposure to multiple hazards more than factors related to geomorphology in Kathmandu Valley (Dahal et al., 2008). Therefore, the introduction of land use restrictions is related to subdivision restriction, land classification, lot size control and risk reduction works.

Apart from the mandate given to the government to implement these risk reduction activities, the *National Land Use Policy* provided guidelines on the management of land protected from potential hazards, particularly flooding. The *National Land Use Policy 2012* mandated the construction of embankments which did not affect the natural course of rivers. It allowed land to be reclaimed for purposes such as agriculture, roads and tourism as appropriate (Government of Nepal, 2012, Article 8.8.3). The *Land Use Policy 2015* designates natural hazard-prone areas and specifies permitted use of such land (Government of Nepal, 2015b, Article 10). It stipulates that it is the master policy for all other policies to the extent to which they address land management issues, including government guidelines that address the prevention of natural disasters such as flooding or landslides.

Flood Risk Reduction

The flood model of the 50-year return period of Kathmandu Valley prepared by the Department of Water Induced Disaster Prevention (DWIDP) shows that the central part of the valley is prone to flooding (Department of Water Induced Disaster Prevention, 2009). The flood model indicates that the catchment's lower reaches can have a maximum flood depth of 14.9 metres (2009) (Figure 3-9).

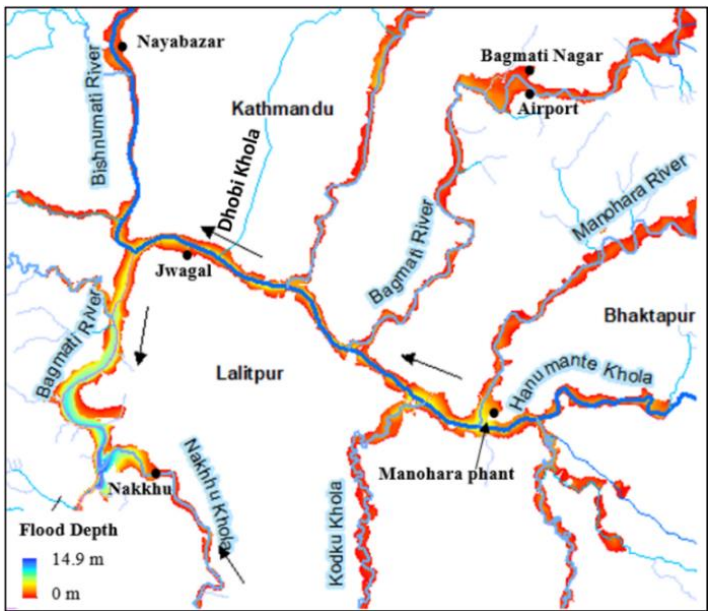


Figure 3-9: Predicted flood model for Kathmandu Valley

Source: Department of Water Induced Disaster Prevention (2009)

Realising that the environmental condition of the Kathmandu Valley is worsening due to human encroachment, congestion and pollution, the Government of Nepal constituted the High-Powered Committee for Integrated Development of the Bagmati Civilisation in 2009. The committee took the responsibility to build the Bagmati Corridor Road along the Bagmati and Dhobi Khola rivers. These activities protected the nearby land from flooding. Land development programs were conducted at some of the protected locations which supplied risk-reduced land to the land market.

Landslide Risk Reduction

The *Risk-Sensitive Land Use Plan 2015* prepared by the Kathmandu Valley Development Authority (2015b) recommends development activities only in areas with a slope of less than 30 degrees (p. 61). It prohibits any construction activities in areas having a slope of more than 45 degrees (p. 71). One of the criteria in designating land for residential use set by the National Land Use Project of the Government of Nepal was that residential development must not be in areas having a slope of more than 30 degrees.

3.3.5.5. Execution of Resettlement Program

Resettlement of Landless People Living in Slum Areas

The population living in urban slums has been rising in Nepal, with data showing it increased from 1.2 million people in 1990 to 2.9 million in 2018 (UN-HABITAT, 2018) (Figure 3-10). A growing number of informal settlers are living in ecologically sensitive and marginal areas across Nepal—such as along the side of rivers—thus increasing their exposure to the risk of flood, fire and health hazards (Bakrania, 2015a).

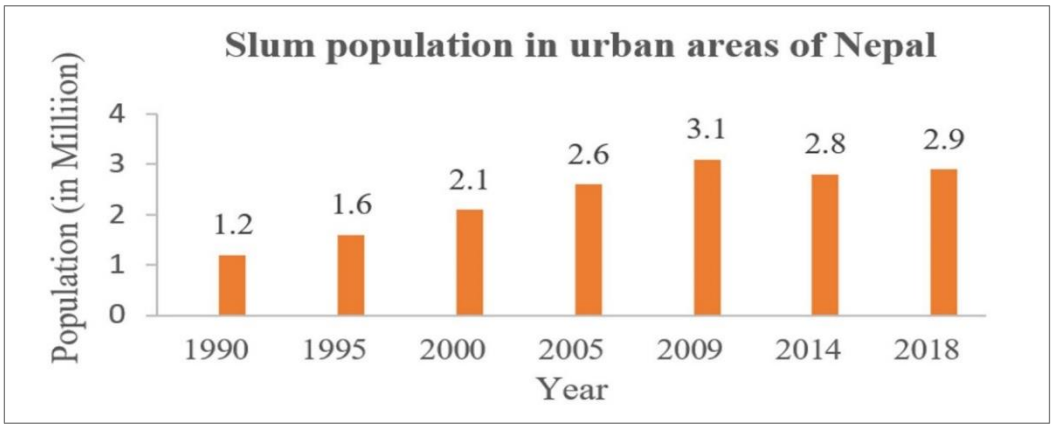


Figure 3-10: The proportion of the urban population living in slums
Data Source:(Bakrania, 2015a; UN-HABITAT, 2018)

According to a report published by the Kathmandu Valley Development Authority, 40 informal settlements comprising 3000 households live in Kathmandu Metropolitan City (Joshi, 2015). To address the problem of urban slums, the *National Land Use Policy 2012* provides for the resettlement of landless people living in vulnerable areas (Government of Nepal, 2012, p 6., Article 8.6.1). The policy states: "The state shall implement low-cost housing programs to ensure the safe settlement of landless people and those having a low accessibility to land."

The reintroduced version of the policy also maintains that landless people should be resettled in a safe area (Government of Nepal, 2015b, p. 8, Article 6.10).

In light of the growing number of informal settlements and people living in slum areas, the Government of Nepal initiated a program to shift the slum dwellers living around the centre of Kathmandu Valley. In 2012, the government announced that informal settlers living along the banks of the Bagmati River in the Sankhamul area of

Kathmandu were to vacate the area. They ignored this instruction, so the government proceeded with a forced eviction using dozers which demolished the cluster houses (Joshi, 2012) (Figure 3-11).

Figure 3-11: Bulldozing of informal settlement at Sankhamul
Source:(Joshi, 2012)

Following their dispersal, the Kathmandu Valley Development Authority executed a low-cost housing project to shift the informal settlers to the Ichangunarayan Land Pooling Area in the north-west of Kathmandu Valley (Figure 3-12). The resettlement area, 4300 square metres in size, was a part of the Ichangunarayan Residential Planning Project acquired for the safe resettlement of slum dwellers. A total of 227 low-cost residential units were built for the resettlement purpose. However, the buildings, completed in 2014, are still mostly vacant and deteriorating as people did not want to move to this new area (Chand, 2019).

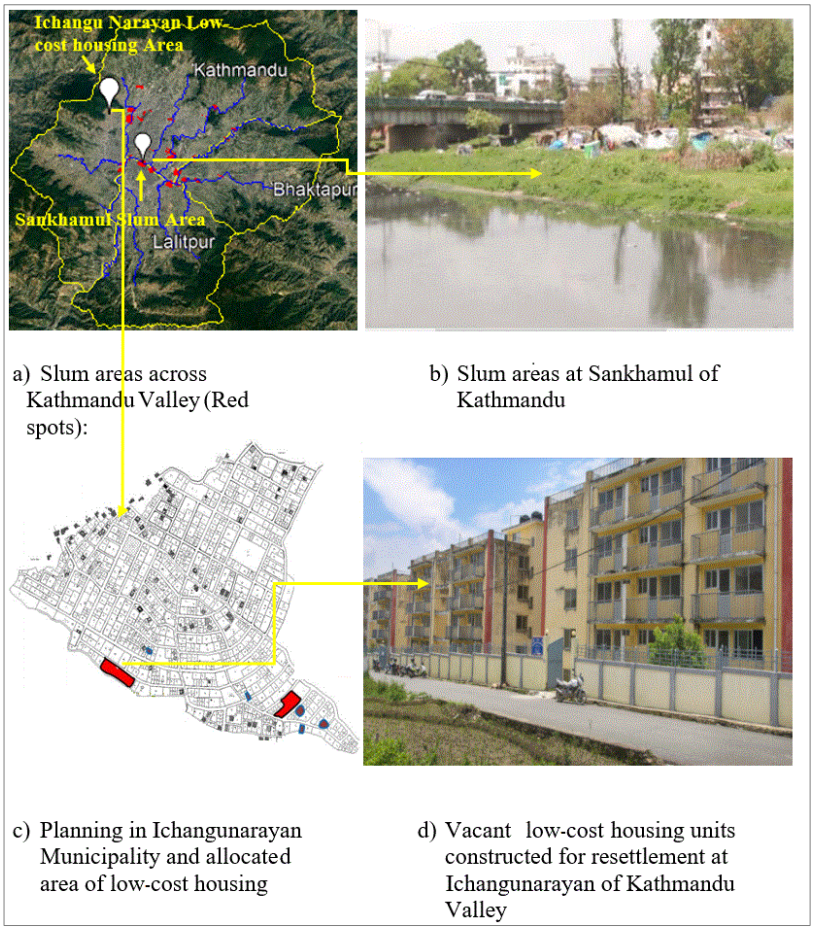


Figure 3-12: Resettlement planning for slum dwellers.

Source: Kathmandu Valley Development Authority Archive (2015)

Resettlement of People Living in Geographically Hazardous Areas

The *Land Use Policy 2015* stipulates the resettlement of those living in geographically hazardous areas (Government of Nepal, 2015b, Article 6.5, p. 9). Under this policy, the Government of Nepal established the National Reconstruction Authority (NRA) to execute a program of relocation, reconstruction and resettlement for households living in in hilly districts affected by the major earthquake of 2015. The NRA's technical team performed on-site vulnerability assessment throughout the affected districts and identified a number of households needing resettlement in areas identified as safe.

3.3.5.6. Lot Size Control

The actions of middle-men between landowners and buyers (called 'land brokers' in the Nepalese land market), who operate at the local level, significantly contribute to the fragmentation of agricultural land in Nepal, as they facilitate privately developed

subdivisions (Shrestha, 2011). To control the rapid and rampant fragmentation of Nepal's agricultural land, the *National Land Use Policy* imposes subdivision control by introducing minimum lot sizes for different land uses (Government of Nepal, 2012, 2015b). The literature provides examples of countries where threshold lot sizes have been introduced to either limit holding sizes, such as in Pakistan (Dowall, 1992), or for environmental safety reasons, such as in the USA (Jaeger, 2006). Some authors argue that the smaller the size of the parcel, the better its efficiency in urban use (Jacobs and Appleyard, 1987). However, too small a lot size promotes the over-fragmentation of agricultural land and can be challenging for urban development, particularly in developing countries where land use regulation is poorly implemented—as seen in the Nepalese districts of Chitwan and Kathmandu Valley (Shrestha, 2011; Upreti et al., 2017).

In 2017, the Kathmandu Valley Development Authority increased the threshold lot size from 2.5 Ana (80 m^2) to a minimum lot size of 8 Ana (254.32 m^2) in three New Town Development Areas of Kathmandu Valley (Figure 3-13). Any subdivision a parcel size less than the minimum standard size would not qualify for a transaction.

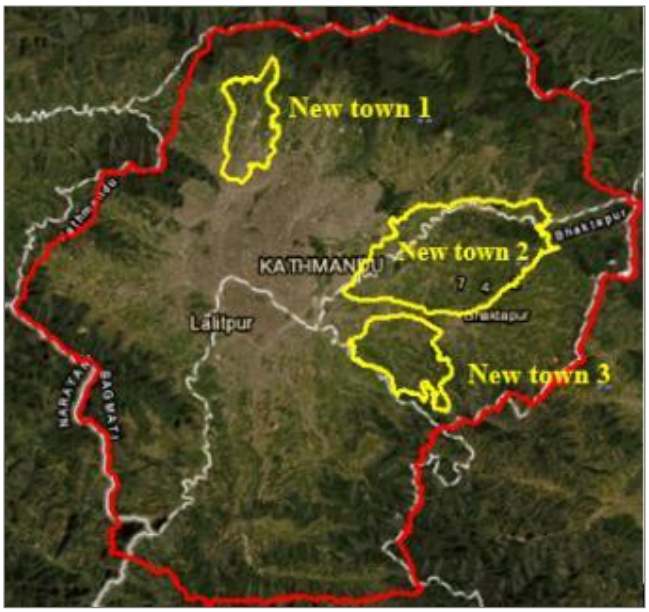


Figure 3-13: New town development areas in Kathmandu Valley

Data Source: KVDA (2017)

3.3.5.7. Land Pooling

Rapid population growth in Nepal has resulted in a sprawling, fragmented pattern of urban expansion characterised by inefficient land use, poor mobility, and insufficient

infrastructure delivery (Shrestha et al., 2017). Poor implementation of land use planning has resulted in a low standard of living with poor quality of life for many people in urban areas, severe environmental degradation and few public open spaces (Karki, 2004; Oli, 2010). These problems were partly addressed through the implementation of the land pooling project.

The first land pooling project in Nepal was formally implemented in 1988 in the Kathmandu Valley at a time when there was limited land use regulation in the country. Land pooling is regarded as an effective tool in controlling haphazard urban growth, and has been successfully implemented in many countries such as Australia (Archer, 1988), Taiwan, South Korea and Germany (Schnidman, 1988; Paudel et al., 2013). The Government of Nepal included land pooling in the land use policies of 2012 and 2015 as a strategy to control haphazard land fragmentation in urban areas and to supply standardised residential plots (Government of Nepal, 2012; Paudel et al., 2013; Government of Nepal, 2015b).

Land pooling in Nepal generally followed the procedure defined by Archer (1988), where a large number of small land parcels possessed by individual landowners are acquired, consolidated, subdivided and redistributed to the corresponding landowners (Karki, 2004). Land pooling projects have been successfully completed in some areas in Nepal that otherwise would have turned into haphazardly developed residential areas similar to the surrounding non–land-pooling areas (Faust et al., 2020). The location of completed and ongoing government-operated land pooling projects as well as privately run housing and apartment projects in the Kathmandu Valley is shown in Figure 3-14.

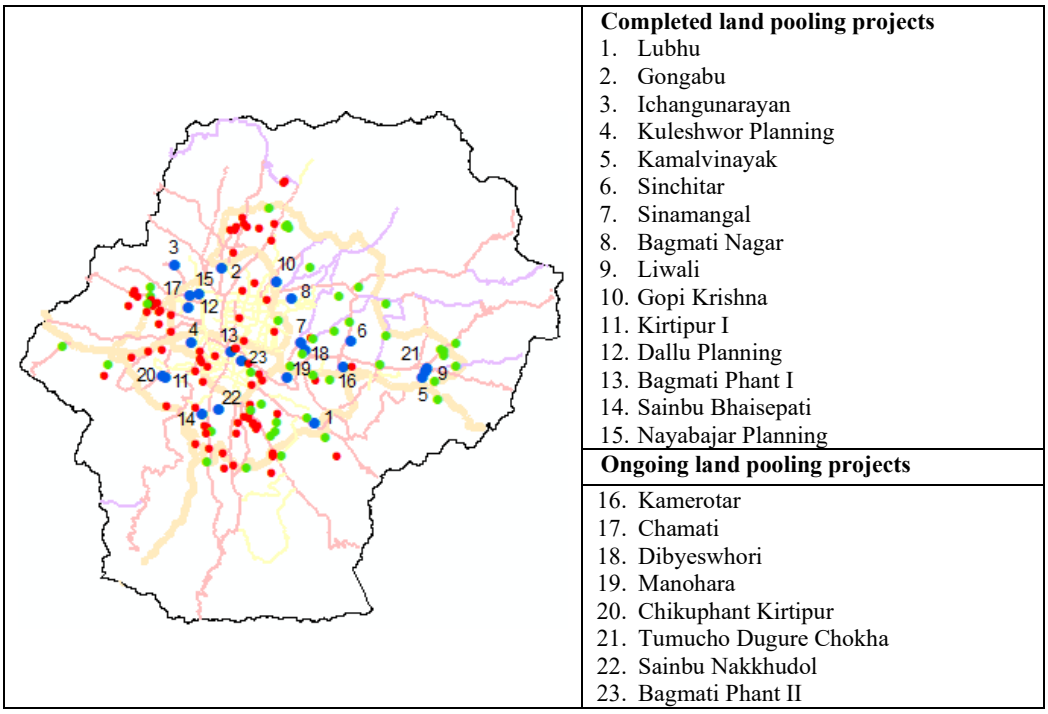


Figure 3-14: Spatial distribution of housing and land development projects

Source: DUDBC 2018, KVDA 2018

3.3.5.8. Penalties against 'No Use'

Both the 2012 and the 2015 land use policies penalise landowners who do not use the land according to the land classifications introduced by the government. The *Land Use Act 2019* specifies the extent of penalty in terms of custodial sentences and fees imposed on landowners who violate the act. Two municipalities in the Kathmandu Valley—Godawari and Dakshinkali, respectively in Lalitpur and Kathmandu districts—set penalty rates to charge those landowners who keep their land unused.

3.4. Land Market in Nepal from the Three Pillar Perspective

The land market in Nepal can be described using the analogy of the three-pillar model by Dale and McLaughlin (1999): the land valuation system, land registration and cadastral services, and financial services (see Figure 2-1 in the Chapter Two). According to this model, actors including landowners and buyers, financial institutions, land developers and their professional organisations, and land administration authorities, interact at different levels to achieve a market outcome. In Nepal, these actors participate in land transaction processes through land revenue and

survey offices located in each district throughout the country. In Nepal, more than 25 million land parcels are recorded in District Land Revenue Offices across the country (Nepal and Marasini, 2018).

The Land Revenue Office also acts as a coordinating body to set the minimum land valuation for transactions (Ghimire et al., 2015). The District Land Revenue Office and the Survey Office provide land records to their customers—landowners, notaries, financial institutions, land developers and real estate agents. Financial institutions offer credit services to landowners by holding their ownership rights as collateral (His Majesty's Government of Nepal, 1978; Nepal Rastra Bank, 2011). Market participants mutually interact with each other, leading to the transfer of land rights through the land transaction process (Tuladhar, 2004; Acharya, 2008). The legal framework for the Nepalese land market comprises the *Land Revenue Act* (His Majesty's Government of Nepal, 1978), the *Land Act* (His Majesty's Government of Nepal, 1964) and the *Land (Survey and Measurement) Act* (His Majesty's Government of Nepal, 1963). However, the implementation of the *Land Use Policy* and the recent introduction of the *Land Use Act* (Government of Nepal, 2019) have begun impacting the land market in a variety of areas.

3.4.1. Land Registration and Cadastre

The system of land registration and cadastre provides the means for recognising formalised property rights and regulating the character and transfer of these rights in Nepal. Land registration is one of the main functional components of Nepalese land administration. The Ministry of Land Management, Cooperatives and Poverty Alleviation, is the main agency overseeing land administration services at the national level (Figure 3-15). There are four departments under the ministry: the Department of Land Management and Archive, the Survey Department, the Land Management Training Centre, and the Trust Corporation. Locally, there are 131 Land Revenue Offices and 21 Land Reform Offices under the Department of Land Management and Archive, 131 Survey Offices under the Survey Department, and nine Trust Offices under the Trust Corporation (Ministry of Land Management Cooperatives and Poverty Alleviation, 2019). The role of these land administration organisations is discussed below.

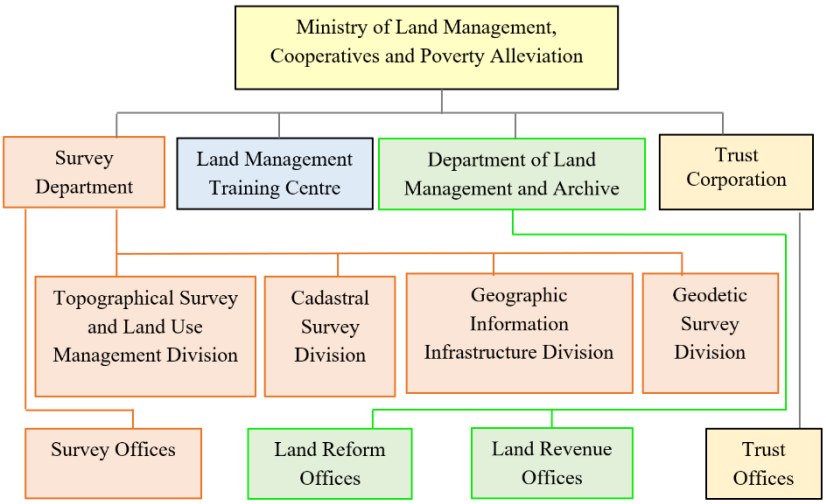


Figure 3-15: Organisational structure for land administration in Nepal

Ministry of Land Management, Cooperatives and Poverty Alleviation: The main functional areas of the Ministry (previously called Ministry of Land Reform and Management) are land policy, planning and implementation; monitoring and evaluation of land reform and management; land revenue and registration; survey and mapping; management of trust land.

Department of Land Management and Archive: The Department is responsible for land management and land administration activities in the country. It is also responsible for archiving land records and providing land information to the public.

Survey Department: This department prepares and maintains cadastral maps and records; it is the national mapping organisation in the country. The department comprises four divisions: Geodetic Survey Division, Cadastral Survey Division, Topographical Survey and Land Use Management Division, and Geographic Information Infrastructure Division.

Land Management Training Centre: The Centre is responsible for training personnel in surveying and mapping, land administration and geo-informatics. These are delivered through a series of training courses across the various areas of land management.

Trust Corporation: This administers trust land in the country. Locally called *Guthi land*, trust land is assigned to *Guthi*, which represent particular cultural or religious

community organisations registered for philanthropic or religious purposes. Each *Guthi* community is registered as a landowner in the land records and is not subject to change in ownership unless the government decides otherwise if they are found to have misused the land for another purpose.

Trust Office: With offices located in various parts of the country, the Trust Offices maintain the records of *Guthi* lands within their jurisdictions. These offices collect land revenue from the *Guthi* lands. However, if there is no Trust Office established in a district, this responsibility is assigned to the Land Revenue Office.

Land Reform Office: Its offices maintain tenancy records, adjudicate land tenancy and fix rents. In the past, there was a legal provision for dual ownership of land. A tiller or cultivator could legally register him- or herself as the tenant of land under a sharecropping agreement with the landowner. The tenant would then hold ownership rights on half of the land area, called tenant's rights. Although the legal provision had also bound the tiller to provide the produce to the landowner, the issue of ownership claim by the tenant created a considerable number of conflicts and court cases, which resulted in low productivity. The government has eliminated the dual ownership system, and such cases are being settled. The Land Reform Office also once maintained the records of tenants. With the elimination of the dual ownership system in the country, the number of these offices is gradually decreasing in Nepal.

Land Revenue Office: This Office is a component of local land administration. It registers and archive deeds, maintains ownership and restriction records, and collects registration fees and other taxes. The Land Revenue Office values land for registration purposes at the district level.

Survey Office: This provides technical support to the Land Revenue Office. Its main functions are to collect, maintain and update cadastral records and parcel subdivision.

The other local-level organisations concerned with the land registration process are the municipalities and rural municipalities (previously called Village Development Committees—VDCs). The role of municipalities is to provide personal information regarding births, deaths, marriages, divorces, relationships and migration, to provide valuation reports and recommendation letters, and to collect land revenue and property taxes.

The system of land registration plays a key role in the day-to-day transaction activities in a formal land market system as it facilitates land transfer, ownership and property rights. This indicates that the role of land registration in a formal land market such as in Nepal is an active system. As discussed above, land administration authorities are present at different tiers of the land governance system and therefore play various roles depending on the hierarchy of the organisation - the Ministry at the national level to the land registration and cadastral survey offices at the local level. The land use policy decisions made at the ministerial level, such as sub-division restrictions or lot size control, are implemented by the local land administration agencies at the district level and can have a direct impact on the land market across multiple dimensions.

3.4.1.1. Land Tenure in Nepal

The traditional form of land tenure in Nepal was state ownership, where the state controlled the ownership of and access to land through orders declared over land by the crown. Private property rights to land came into place after Nepal introduced a land reform program in 1964, followed by the delineation of cadastral lot boundaries and the establishment of land records. The prevalent land tenure system, known as *Raikar*, allows landowners to enjoy land rights. All landowners need to pay land tax to the state. The records regarding the private ownership rights on *Raikar* lands are kept in the Land Revenue Office. The spatial boundaries and cadastral maps are maintained by the Survey Office. There are lands owned by the government and the public. They are called government land or public land, depending upon who is registered in the cadastral records. Apart from *Raikar*, government and public lands, some land is assigned to philanthropic institutions for religious or cultural purposes. Such land is registered under the *Guthi* tenure and administered by the Trust Corporation in Nepal.

3.4.2. Land Valuation

Land valuation is a key function of a land administration organisation. The value of land is used for many purposes, including taxation, land transactions, mortgages, investments, insurance and compensation. Three approaches to land valuation are a comparative sales approach, an income approach and a cost approach (UNECE, 2005). Computer software has been developed to automate the process of valuation. Computerisation can considerably reduce the costs of valuation, make the valuation

process more transparent, and reduce undue influence by taxpayers (Muller, 2002). The use of geographic information systems (GIS) and statistical techniques such as regression and other automated valuation methods has lowered the cost and increased the speed of mass valuations of real property for taxation purposes.

The Government of Nepal commenced, in 1982, a process to determine the minimum valuation of land for taxation purposes. A Threshold Land Valuation Committee (TLVC) in each district determines minimum values before the start of each fiscal year in mid-July.

Consideration is made of factors such as economic activity, population density, land topography, road facilities, agricultural production, commercial and tourist centres, education, health, employment and security, development activities, size or shape of the land, risks and migration when determining the minimum valuation of land as per the Directives for Determining Minimum Valuation, 2003 (Subedi, 2016). In practice, however, the major criteria of land valuation were found to be type of land, adjoining roads, housing suitability, irrigation facilities and prevalent market values (Ghimire et al., 2015).

Each municipality or rural municipality also determines land values for the purpose of annual property tax collection. The valuation is based on the minimum land value determined by the Land Revenue Office and the existing land market values. Financial institutions also value land for the purpose of providing loans during mortgaging. They adopt a sales comparison method in determining the value of land for collateral purposes (Subedi, 2016).

A land value determined by a particular agency may differ from that determined by another agency—for example, the value of land determined for taxation purposes differs from its value for a mortgage; a compensation amount determined for expropriation differs from the land value used for taxation. While mortgage or compensation values are determined on a case-by-case basis, land valuation determined by the Threshold Land Valuation Committee is done through a mass valuation. This is, therefore, the predominant practice in Nepal and is generally used to determine land value in other circumstances. Ghimire et al. (2015) discuss the existence of various values such as market value, mortgage value, tax value and

compensation value for the same parcel of land which can result in juridical, social, economic and technical problems in the Nepalese context. This highlights the need for legal and organisational reform, capacity building, and functional spatial data infrastructure (SDI) in Nepal.

Each Land Revenue Office annually assesses the market value of land through the Minimum Land Valuation Committee (MLVC) as prescribed in the *Land Revenue Act 1978.* The Committee then designates a minimum valuation of land within its jurisdiction for a fiscal year's taxation purposes. During the valuation process, the committee considers the quality and grades of roads connected to the land under consideration in both planned and unplanned areas. While no standard has been adopted for the road classification system for taxation purposes in Nepal, land adjoining a better-quality road is higher in value than that connected to a lower quality road. Wider sealed roads in a planned urban area are considered higher in quality than unsealed, narrow streets in an unplanned location. Land with no road connections, as well as those in flood-prone areas, have been assigned the lowest minimum value for taxation purposes.

3.4.2.1. Land Taxation

Governments employ taxation as an economic tool to regulate economic development and taxation policy. They collect taxes as a source of revenue to carry out their legitimate objectives and cover expenditures (Sahari et al., 2020). In Nepal, various types of land tax are levied by the government: annual land tax, land transfer tax and capital gains tax. A landowner is subject to paying an annual tax, administratively known as *malpot* to the local government. The annual land tax structure is based on the valuation for taxation purposes fixed by the local government and is determined by the size and the location of the land. A landowner must have paid the annual tax to the local government before submitting an application for a land transaction.

Land transfer tax is charged during the land transaction process, the former to be paid by the buyer and the latter by the owner. Before state restructuring, the transfer tax and the capital gains tax were collected by the national treasury. After the state restructuring in 2018, these taxes are collected by the state government treasury. The Land Revenue Office collects the transfer tax during each land transaction. Transfer

tax is determined on the percentage of the transaction prices, which differs in a municipality from that applicable in the metropolis or a rural municipality. The state also levies capital gains tax (CGT) on land property during transaction through an LRO, if its value exceeds NRs 3 million.

The *Land Use Policy 2015* specifies progressive taxation based on the Parcel-Based Land Information System (PBLIS). However, because of the stipulation that land zoning information is not to be distributed before the completion of zoning of the entire country to avoid land speculation, the land taxation system in Nepal has mostly remained stagnant with the land classification system established in 1964. One of the six problems of the taxation system in Nepal is the absence of a consolidated record of property (land and buildings) within the Internal Revenue Department (Dahal, 2011), which has forced the government to adhere to the value-based taxation system rather than the PBLIS.

3.4.3. Financial Institutions

Financial institutions, the third pillar of the land market, have played a major role in financing the land market in Nepal. The country has 7389 financial institutions (Nepal Rastra Bank, 2019a), which include distributed branches and subbranches of the commercial and development banks, which are mostly based in the capital, Kathmandu. These financial institutions are key players in Nepal's land market as they provide credit to its participants. Landowners or tenants invest labour and capital in the land for its efficient use and higher productivity. A large number of community-based cooperatives have also been established in Nepal which remain outside the jurisdictions of the Federal Reserve Bank (FRB, locally called Nepal Rastra Bank) (Upreti et al., 2017). These cooperatives have played a significant role in Nepal's real estate boom (Shrestha, 2011). Owners or tenants may reinvest a part of the output from their activities into land to enhance its productivity.

A review of financial reports published by the FRB showed the increasing accessibility to the banking system in Nepal. Out of the 753 local administrative units in the country, the banking service reached 747 by July 2020. At the same time, the number of loan account holders across the country was 1,544,000 and the number of savings accounts

was 32,454,000. These financial institutions provide loans for real estate and residential housing in Nepal (Nepal Rastra Bank, 2011, 2020a).

Despite this investment, deposits and loan accounts increasing in bank and financial institutions (BFIs), Nepal has not achieved a satisfactory level of economic development and growth due to conflict and political instability in the country (Sapkota et al., 2008). Although the number of banks is increasing, they are limited only to the urban areas so that many banking services are not yet accessible to the general public.

3.5. Stakeholders and their Interaction in the Land Market

The incorporation of stakeholders in impact analysis is one of the essential components of change measurement in a responsible land administration system (Zevenbergen et al., 2016b). The contextual significance of the impact outcome can be best explained if the stakeholders' views are incorporated into the multi-criteria analysis (Macharis and Crompvoets, 2014). Freeman (2010) describes a stakeholder as a person or a group who can influence or be influenced by an organisation's purpose. The final message that can be drawn from the chronology of stakeholders identification research presented by Mitchell and Lee (2019, p. 55) is that stakeholders are benefitted or harmed by the organisation's decision, or that stakeholders' rights are violated or respected by corporate decisions; they keep an interest in the action of the organisation and have an ability to influence it.

Land market stakeholders in Nepal broadly range from individual landowners to corporate land developers, banks and financial institutions, land administration agencies, notaries, buyers, and local bodies. These stakeholders can be classified into several smaller categories; however, dealing with each stakeholder in isolation is not possible and, therefore, those representing more or less similar domains or sectors can be integrated into similar categories (Freeman, 2010). By categorising stakeholders partly on the basis of their social identity, a stronger basis is provided for including these values and interests (Crane and Ruebottom, 2011).

A 'stakeholder', in this study, is a person, a group of individuals or an organisation which participates in the land market processes. Landowners, cadastral and land

registration organisations, real estate agencies, land developers, banks and financial institutions are identified as the key stakeholders in a land market (Dale et al., 2006). Considering their role in the land market, stakeholders can be categorised into three broad groups in the Nepalese context: (i) a private sector group comprising landowners, private and professional groups comprising real estate, private land and housing developers, and local land experts, surveying and engineering consultancies who have a stake in the planning and development of private land; (ii) banks and financial institutions and groups of them; and (iii) institutions comprising government agencies, including ministries and departments which have a stake in the governance of the land administration system, such as registration, surveying, land use mapping, and implementation. In the latter group, the key land agencies identified as stakeholders in the Nepalese land market include the Ministry of Land Management, Cooperatives and Poverty Alleviation, the Survey Department, the Department of Land Management and Archive (DOLMA), the Federal Reserve Bank (FRB), the Credit Information Bureau (CIB), Real Estate Agent Association of Nepal (REAAN), the Nepal Land and Housing Development Association (NLHDA) and the Notary Association of Nepal.

These stakeholders interact with each other within the given institutional framework that gives rise to land market outcomes. A general land market process in a broader context is summarised in Figure 3-16. In Nepal, land transaction activities are carried out through the district survey and land registration offices, which are also involved in the implementation of land use regulation at the local level. Agents such as landowners, buyers, tenants, financial institutions and land administration authorities are the major stakeholders in the land market.

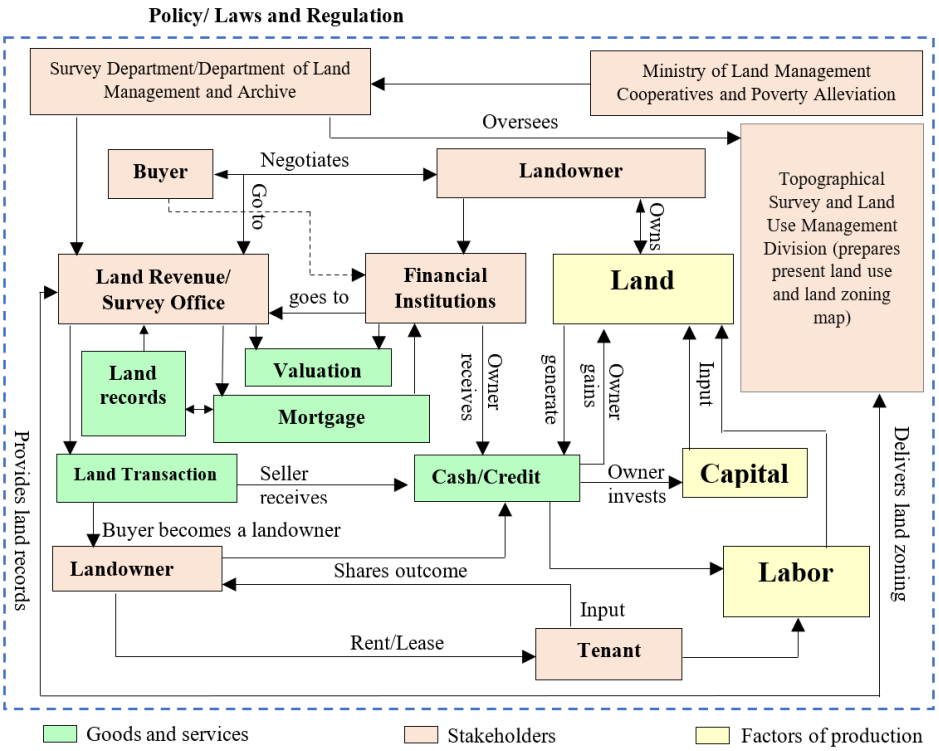


Figure 3-16: Interaction among stakeholders in the land market process in Nepal

A buyer goes to the land revenue office and survey office for any land transaction and acquires land through a contract and transaction with a landowner. BFIs may provide a loan for the purchase through mortgaging the land. Landowners or tenants may invest a part of the cash they receive after selling their land or the income through their activities on the land to enhance the property's productivity. However, land use regulation may limit further land development or activity. These impacts can be seen from economic, social, environmental and institutional perspectives, the focus of this study.

A review of literature also indicates that land grabbers (Williamson et al., 2010; De Schutter, 2011; Borras and Franco, 2013; Margulis et al., 2013) can have significant impact on the supply side of the land market. In Nepal, the landlord system was prevalent before the introduction of land registration system in 1964 (His Majesty's Government of Nepal, 1964). The provision of large-scale landholdings and grabbing was abolished in 1964 after the enactment of the Land Act 1964. According to section three, article 7.1 of the Act, no more than 1.27 hectares of private land can be possessed by a landowner. With the completion of cadastral surveying and initial land

registration of private land in Nepal, any landowner who held land more than the land ceiling could be identified.

3.6. Chapter Summary

This chapter reviewed the land use implementation and land market environment in Nepal. Firstly, it reviewed the geographic and socioeconomic situation in Nepal. Population growth, rural-to-urban migration and remittance inflows from foreign employment have been the contributing factors in creating the demand for land in Nepal, particularly land for housing in urban areas. Nepal has experienced rapid agricultural land fragmentation, which led the government to make policy changes to control the subdivision of agricultural land. Other initiatives taken by the government have been the enforcement of a land classification system, the expansion of rights of way, lot size control, land pooling, natural hazard control, resettlement of people from hazard areas, and the imposition of penalties for misuse or lack of use of land. However, the multiplicity of organisations involved in land use, the absence of coordination and a poor organisational framework are limiting the smooth implementation of land use regulation in Nepal.

The land market in Nepal fulfils the basic land market requirements by having fundamental components such as land valuation, financial institutions and a land registration and cadastral services. However, the implementation of land use regulation may have impacted the land market in areas such as the quantity of land supply and changes in the valuation, demand or supply of land. Land market participants might have their own perceptions of the impact of land use regulation. This chapter answered the second research question and achieved the second research objective. The next chapter presents the research design and methods adopted to identify changes that have occurred in the land market in Nepal across the economic, social, environmental and institutional dimensions through stakeholders' perspectives, and by comparing the evidence of impacts on the land market before and after the implementation of land use regulation.

Chapter 4: Research Design and Methods

4.1. Introduction

Chapter Two of this thesis examined the theoretical foundation for measuring the impact of land use regulation on the land market and highlighted the impact factors that can be considered in its assessment. Chapter Three reviewed the existing land use and land market in Nepal. This chapter focuses on the research design and methods adopted to answer the research questions and achieve the research objectives. It is divided into two parts. The first part of the chapter investigates the conceptual research design framework by exploring the research gaps, examining the research questions and developing the research design framework. The second part of the chapter discusses the research methods, including a description of the study area, the data collection strategy adopted, and analysis, interpretation, validation, and ethical considerations. The chapter concludes with a summary.

4.2. Research Design Framework

4.2.1. Gaps in the Research

In Chapter Two, the theoretical foundations of a land use–land market relationship and the approach to land market assessment were reviewed. It was found that a land market is a composite construct of systems of land use, land valuation, land registration and financial services operating within a broader land policy framework, where its participants interact with each other to acquire goods and services. Despite the diversity of components, most of the research that investigates the impact of land use regulation on the land market focuses on the effect on land values and property rights, which impact across the economic and institutional dimensions. However, 'participants' are the components of a land market who may be affected by changes in institutional arrangements, policies or laws. Introducing land use regulation can bring satisfaction or dissatisfaction to market participants and can be considered through a social lens. The literature review also indicated that the impact of the land use regulation could be viewed environmentally. This suggests that a land market cannot

be entirely assessed using a single theoretical lens. Various theories—neo-classical economics, old institutional economics, new institutional economics, transaction cost theory and land administration theory—were examined in isolation to explain the impact of land use regulation on the land market. An examination of the land market based on a single theory can therefore only offer a limited explanation of impacts across the broader segments of the land market. However, a holistic assessment can address a land market in its entirety and consider multiple land market impact factors across various dimensions—explored to a lesser extent in land administration studies. This research intends to fill this identified gap by considering changes in the land market between the pre- and post-land use regulation period across economic, social, environmental and institutional dimensions. At the same time, it explores what stakeholders think of the impact on the market across each dimension. The assessment adopts a pluralistic approach in synthesising findings based on the perspective of the land market stakeholders and grounded in evidence across multiple dimensions, an approach less extensively addressed in the literature.

4.2.2. Research Design

A research design is a structural framework that guides the methods and decisions that researchers must make during their studies; it sets the logic by which they interpret the outcomes of their studies (Creswell and Plano, 2011). Designing research involves selecting a research approach, methods, data collection strategy, and techniques and procedures of data collection and analysis which, at the broader level, rest on the researcher's thoughts and perceptions of the worldview relevant to the subject under study (Creswell, 2014). Saunders et al. (2019) present an onion-shaped research design framework that offers a range of choices as the research progresses inward from the topmost layer of philosophy (Figure 4-1). The following are the layers of the Research Onion:

- Research philosophy
- Approach to theory development
- Methodological choice
- Research strategy
- Time horizon, and
- Techniques and procedures.

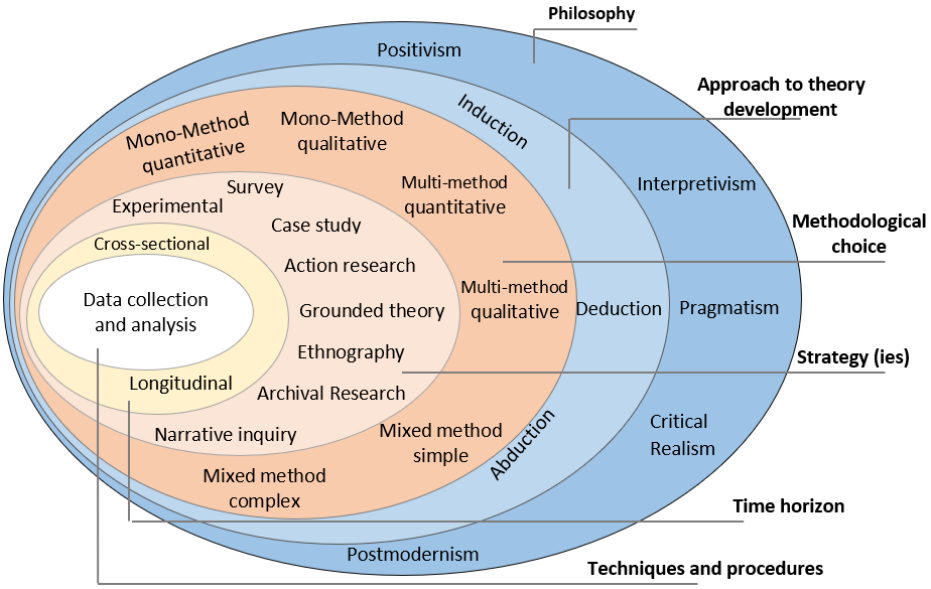


Figure 4-1: Research onion

Source: Saunders et al. (2019)

This research design framework will be utilised to guide this research.

4.2.2.1. Research Philosophy

Research philosophy is the topmost layer of the Research Onion that relates to the nature of reality being studied. Saunders et al. (2019) discuss five philosophies: positivism, interpretivism, pragmatism, critical realism, and postmodernism in the context of ontology, epistemology and axiology.

Ontology relates to the overall nature of what things are (Denzin and Lincoln, 2011); it addresses the cause-and-effect relationship between events that occur in nature. Based on such relationships, future events can be predicted. The objective view of ontology is based on the belief that truth is universal and single. However, ontology is also based on the belief that our sense of reality depends on our understanding and interpretations. The subjective view of ontology assumes that there is always more than one way to interpret or explain something (Saunders et al., 2019). The way we interpret or make sense of a worldview depends on the perspective that we have. Arguing about whose interpretation is correct does not make sense because all interpretations are likely to be partially positive and partially negative to any given observer.

Epistemology concerns what we can know and how that knowledge is achieved (Crotty, 1998). It focuses on the process of understanding what constitutes acceptable, valid and legitimate knowledge and how we can communicate knowledge to others (Saldaña, 2013). Epistemologically, objectivists strive to discover 'the truth' about the social world by observable, measurable facts and draw law-like generalisations. They establish a theory about social reality based on research. The subjective approach of epistemology concerns opinions, narratives or the attributed meanings and assumptions of the arts and humanities (Saunders et al., 2019).

Axiology refers to defining, evaluating and understanding the concepts of right and wrong behaviour relating to the research. It involves the ethical issues that need to be considered when planning research (Kivunja and Kuyini, 2017). Axiologically, objectivists keep themselves detached from their own beliefs and values throughout a rigorous scientific research process, which otherwise could bias their findings (Saunders et al., 2019).

Researchers further shape their study by connecting ontology, epistemology or axiology with research philosophy. The research onion presents five different philosophies: positivism, interpretivism, pragmatism, postmodernism and critical realism, which will now be briefly discussed to identify the best fit with this research.

The positivist approach results in generalisations similar to those made by physical and natural scientists (Saunders et al., 2009). The research phenomena often involve testing formulated hypotheses through the frequent use of large and quantitative methods through inductive reasoning (Creswell, 2014; Saunders et al., 2015; Žukauskas et al., 2018). A researcher remains independent of that which is observed by keeping him or herself external to the research. The research is performed objectively (Saldaña, 2013).

Critical realism explains what we see and experience in terms of the underlying structures of reality that shape the observable events, unlike positivists who reach conclusions based on objectively measured quantities. Positivists generally claim that the first stage is enough and do not venture into further interpretation (Saunders et al., 2019). Chirkov and Anderson (2018) compared positivism with critical realism and

proposed that the former be replaced by the latter. They indicated that critical realism could describe a phenomenon that can be explained through a positivist approach.

Interpretivism is based on the belief that knowledge and meaning are acts of interpretation and explanation; it often employs subjective and qualitative methods (Creswell, 2014; Žukauskas et al., 2018). It assumes no objective knowledge independent of thinking and human reasoning (Saunders et al., 2015).

Postmodernism assumes that a worldview cannot be recognised entirely through the generalisations made by objectivists. Reality cannot be wholly presented as an orderly set of functions identified through numerical figures. Postmodernists believe that any sense of order in describing reality is provisional and without foundation (Saunders et al., 2019). Associated with the things claimed by objectivists as 'solved', there are other things that are rather problematic and unresolved (Gysin, 2004). Postmodernists explore the elusiveness of knowledge and meanings (Kirby, 2006) in research generally. They investigate the chaotic primacy of flux, movement, fluidity, and change within the phenomenon under study. They highlight the marginalised, suppressed and excluded aspects of what it claims to describe while privileging other aspects (Saunders et al., 2019). Kroeze (2012) concludes that postmodernism and interpretivism show similar traits as both rely on the explanation and interpretation of the phenomenon using the expressive power of language.

Pragmatism investigates phenomena that cannot be totally understood or revealed by the objective measures of natural science as described by positivists. Nor can these be identified solely through the subjective interpretation of interpretivism. Thus pragmatism can be treated as a new philosophy that considers that a phenomenon in either domain of natural science or social science needs to be studied by employing both subjective and objective approaches (Tashakkori and Teddlie, 2008; Kivunja and Kuyini, 2017). In the words of Melnikovas (2018, p. 35),

> The strict dichotomy between positivist and interpretivist position is a matter of constant critics on the basis of distinction between natural and social sciences. Positivist philosophy admitting that entities such as ideas or social structures exist independently of human beings, does not take into account the role of individual in a social reality. Conversely, interpretivists claim that existence of the world, independent of human thought and perception is impossible.

The dilemma of fitting a phenomenon into the mono-centric philosophical assumption of positivism and interpretivism inspired theorists to think of a new research paradigm (Melnikovas, 2018). Such a phenomenon needs to be studied using practical and pluralistic approaches that adopt a combination of methods. The integrated approach could reveal participants' actual behaviours and beliefs and the consequences of those behaviours. This gave rise to the emergence of the new philosophical standpoint that allows the pragmatic use of mixed methods in order to understand the phenomena under study; therefore it was called pragmatism (Kivunja and Kuyini, 2017).

The impact of land use regulation on the land market may be measured through the relative judgement of the land market's situation before and after the introduction of land use regulation. Furthermore, a land market is a construct of multiple components and therefore possesses various measurement areas with the various views of stakeholders. A research study undertaking a holistic assessment cannot view the land market entirely through positivism. For this, the researcher also needs to undertake a qualitative analysis of multiple perspectives. Positivism entirely favours quantitative approaches.

However, this study cannot be addressed entirely through interpretivism either because land market assessment does not rely simply on subjective judgements. The researcher needs market-related quantitative information such as land value, demand, supply and transaction volume to identify changes in land market behaviour, as identified in Chapter Two. In addition, the direction of impacts across multiple dimensions may be positive or negative and needs to be supported through both stakeholders' perspectives and quantitative evidence. Addressing these requirements requires a hybrid approach that goes beyond the limits of both interpretivism and positivism and fits the philosophy of pragmatism.

Measuring the impact of land use regulation on the land market in Nepal is, fundamentally, the study of a cause-and-effect relationship, an issue usually explored by ontologists. As discussed above, identifying this impact requires the subjective analysis of multiple perspectives and objective analysis of facts and figures that either validate the former or complement it. Considering these assumptions, this study was viewed through the philosophy of subjective ontological pragmatism.

4.2.2.2. Approach to Theory Development

The Research Onion offers three alternative research approaches: deductive, inductive and abductive (Saunders et al., 2019). Although Saunders et al. (2019) label research approaches as 'approaches to the theory development', they do not necessarily mean building new theory (Melnikovas, 2018; Saunders et al., 2019, p.153). In a deductive approach, research starts with the assertion of the general rule and proceeds to a specific conclusion. The deductive approach is considered a top-down approach (Creswell, 2014). This approach is adopted to test a theory under consideration. Provided that the original assertions are true, then the conclusion must also be true in a deductive approach (Given, 2008).

In an inductive approach, research begins from observing the phenomena under study and ultimately attempting to define a broad statement (Saunders et al., 2009). It involves gathering data and evidence, investigating the existence of patterns, and forming a hypothesis or theory to explain what is seen (Žukauskas et al., 2018). The movement is always from the specific to the general. Inductive research follows a bottom-up approach (Given, 2008; Creswell, 2014).

An abductive approach rests upon the concept that finalising research may not be a straightforward progress in either direction (top-down or bottom-up) as described in the deductive and inductive approaches. Abductive reasoning mostly depends on a limited set of data and yields conclusions based on the information at hand, which is why it is often applied in the medical field or a criminal investigation (Given, 2008).

While identifying the impact of land use regulation on the land market through the philosophical lens of subjective ontological pragmatism, the researcher must address multiple components of a land market, as discussed above. This implies that multiple perspectives, methods, areas of assessment and theoretical underpinnings are required to holistically measure the impact of land use regulation on the land market. Needham et al. (2011) argue that there cannot be a general land market theory that can address all aspects of a land market in their entirety.

If a land market cannot be seen entirely through a single lens, then a holistic assessment approach may be applied to measure the impact. A review of the literature suggests an exploration across multiple dimensions—the economic, social, environmental and

institutional. The researcher needed to gather data across multiple dimensions to analyse patterns in those data and recognise their impact to demonstrate that multiple theoretical underpinnings are essential for a holistic assessment. Such research must follow a top-down approach and is thus deductive.

The deductive approach states that if the premises are true, then the conclusion is true (Given, 2008). The premises of this research study are:

- Premise 1: Land use regulation impacts the land market (Chapter Two).
- Premise 2: Land markets cannot be assessed entirely through a single lens (Chapter Two).
  Conditions: Nepal introduces land use regulation, and there is an operational land market (Chapter Three).

The conclusive deductive statement is: 'Measuring the impact of land use regulation on the land market cannot be completed through a single theoretical lens.'

4.2.2.3. Methodological Choice

Depending on how one perceives the world and relates it to the purpose of the research, research can be commonly classified as either qualitative or quantitative in method. Another approach to the classification of research methods is identified by how data is collected and analysed, and by the type of generalisations and representations made in using the data.

In simple terms, the choice of research methods depends on the type of data required and the way the data are used in the analysis. According to the Research Onion of Saunders et al. (2019)**,** there are three broad categories of data collection method:

- Mono methods, whereby the researcher adopts a single data collection technique and analysis procedure. Saunders et al. (2019) subclassified mono methods as mono-qualitative and mono-quantitative.

- Multi methods, whereby the researcher uses more than one data collection technique and data analysis procedure. The multi-method is restricted within either a quantitative or qualitative worldview, but not both together (Tashakkori and Teddlie, 2010). Therefore, subclassification is limited to multi-qualitative and multi-quantitative only.

- Mixed methods, where researchers employ both qualitative and quantitative data in the analysis. Saunders subclassifies mixed methods into two: mixed-model research and mixed-methods research. In mixed-model research, quantitative and qualitative are combined to reach a conclusion. In contrast, mixed-method research adopts quantitative and qualitative data collection techniques and analysis procedures, either sequentially or in parallel, but does not combine them (Saunders et al., 2019).

The guiding path for choosing a particular method depends on the philosophical assumptions and paradigms with which the research questions align (Myers, 2013). Identification of the impact of land use regulation on the land market was viewed through the philosophical lens of subjective ontological pragmatism, which is addressed partly by positivism and partly by interpretivism. In pragmatism, truth is relative to the current situation; it often involves investigating the 'what' and 'how' aspects of the research. Realities are identified through mixed-methods approaches—objective and subjective; quantitative and qualitative—depending upon the needs of the study (Alghamdi and Li, 2013; Creswell, 2014). This discussion suggests adopting the mixed-methods approach for this study because both qualitative and quantitative data need to be applied to it to identify the impact on the land market.

Pragmatism allows working in sequence with the data collected for the first round of analysis and synthesising its findings with the second phase of analysis. Within the broader analytical framework, the data sets collected through different methods will be used in a sequential mixed fashion to inform or complement each other.

The selection of a particular research method also depends on the purpose of the research : descriptive, explanatory or exploratory (Saunders et al., 2019). Descriptive research describes a situation to provide a profile of the persons, events or cases under study. Explanatory research aims to establish causal relationships between variables and involves applying statistical tests to the data to get a clear picture of these relationships. Exploratory research explores what is occurring, seeking new insights and asking questions to assess phenomena in a new light; this is followed in this study to identify the land market's behaviour after the introduction of land use regulation in Nepal.

Measuring the impact of land use regulation on the land market requires the identification of impact factors across multiple dimensions. These impact factors will be identified through the qualitative analysis of interview data. These impact factors will then be used to derive impact indices based on the perspectives of stakeholders that were initially collected as qualitative data in terms of scores and ranks. The impact indices can then be interpreted to realise the impact of land use regulation. Since these perspective-based indexes only give the stakeholders' views of the impact of land regulation, the findings need to be analysed against the backdrop of the changes in the land market after the introduction of land use regulation. These changes can be examined by comparing the quantitative land market data of the pre- and post-regulation period. The purpose of the research is exploratory. It first explores land market impact factors previously identified in the literature and those that apply in the local context. It then determines the impact of land use regulation on the land market. The characteristics of this study's design, therefore, can be characterised as an exploratory mixed-methods research design.

4.2.2.4. Research Strategies

Strategies adopted for research data collection are 'research strategies'. Given (2008, p. 5; 287; 846) situated research strategies within the broader context of research methodologies. The literature outlines eight different types of strategy: experiment, survey, case study, action research, grounded theory, ethnography, archival research, and narrative inquiry that can be adopted to conduct research (Paudyal, 2012; Creswell, 2014; Saunders et al., 2019). These strategies were found to be classified in terms of methodological choice.

A case study strategy is preferred where there is a need to obtain a rich understanding of the specific context of the research through the exploration or explanation of the 'what', 'how' and 'why' aspects of the case (Yin, 2014). Case studies may employ various data collection techniques such as interviews, observation, documentary analysis and questionnaires. Case studies can be deductive or inductive, depending on whether these techniques are utilised to test or develop a theory. A survey differs from a case study in that it affords a greater ability to explore and understand the research context with an unlimited number of variables on which to collect data (Saunders et al., 2019).

A survey strategy is usually adopted to answer questions about what, who, where, and how much/many. Survey research tends to be exploratory and descriptive (Saunders et al., 2019). Before collecting the survey data, the researcher needs to be aware of what, how and where they will collect. The survey strategy comprises two distinct tools of data collection: an interview and a questionnaire. Interviews are used to collect qualitative information, whereas survey questionnaires allow the collection of qualitative or quantitative data. Survey data collection is based on the research framework designed within the scope of a theory, and the research process flows in a top-down direction. Survey data collection is therefore deductive.

An archival research strategy is used for identifying changes that have occurred in the phenomenon under study over time (Saunders et al., 2009). Archival research utilises administrative records and documents as principal sources of data. However, answering research questions solely by this strategy depends on the availability and accessibility of administrative records and documents held by various organisations. Archival research refers to recent as well as historical documents (Bryman, 2003).

Research Strategies for the Holistic Assessment of the Land Market

Assessing the impact of land use regulation on the land market holistically requires consideration of stakeholders' perspectives on this market impact. These stakeholders form a large population and represent various sectors such as private land developers, banks and financial institutions, land administration authorities, land valuation agencies, notaries, and land users, buyers and sellers. Although this study may be considered as a case study of Nepal, the presence of a multiplicity of stakeholders with different roles across different segments of the land market calls for other strategies.

As this study requires the collection of primary qualitative and quantitative data to represent the perspectives of land market stakeholders, the survey strategy was thought to be the most appropriate for the first phase of the research. However, perspective-based findings are not sufficient for understanding the impact of land use regulation. Other information that reflects changes in the land market due to land use regulation also should be considered. A comparative analysis which includes archived data reflecting the land market situation before and after the introduction of land use regulation will provide further evidence of the impact of land use regulation in Nepal.

As such, the archival strategy was adopted to collect quantitative secondary data for the second phase of this research. The findings from the second phase of research will assist in identifying any existing differences, provide a contrast to the stakeholder perspectives and help to validate the findings of the first phase of this research.

4.2.2.5. Time Horizon

Research can be carried out within a 'snapshot' of a given time window, or may require a 'snapshot' of a series of events. Saunders et al. (2015) classify the time horizon as longitudinal and cross-sectional. Cross-sectional studies are limited to a specific timeframe, while longitudinal studies are repeated over an extended period. In this research, data were collected in a single snapshot; therefore, this method belongs in the cross-sectional category.

4.2.2.6. Techniques and Procedure of Data Collection and Analysis

Research data collection and analysis techniques are guided by research objectives, research questions and validation requirements. Understanding the stakeholders' perspectives on the impact of the land use regulation on the land market is one of the objectives of this research. This objective will be met by analysing primary information on the various stakeholders' perspectives of the regulation's impact on the land market. Two separate sets of primary data will be collected to address the research question. Qualitative primary data pertaining to the land market impact factors will be collected through the survey interviews, and the score-based quantitative perspectives data pertaining to the level and direction of impact will be gathered through a survey questionnaire. Qualitative analysis will then be performed on the interview data. Quantitative data in terms of score and rank will be processed using the analytic hierarchy process (AHP) to derive impact indices.

However, identifying the impact through the stakeholders' perspectives may not objectively reflect the land market. Understanding the situation of the actual land market requires fact-based data that could inform, complement or contrast with the findings of the perspective-based impact assessment. A fact-based land market assessment necessitates the collection of documentary evidence and archival records that would help compare the land market situation from the pre- and post-regulation periods.

This research utilised archived records as a source of documentary evidence to explore changes in the land market across the economic, social, environmental and institutional dimensions. Documentary-based data sources can comprise organisations' databases, communications, emails, letters, websites, reports and minutes, journals, newspapers, pictures, photographs and other archived information as well as data based on published national or regional statistics, reports and publications.

Land market impact assessment cannot rely simply on stakeholders' responses: it should also be supported by documentary evidence (Dowall, 1995). Stakeholders can give biased answers depending upon their interest in the land market outcome. Land market impact assessment entirely based on stakeholder judgement may raise questions about the validity and credibility of the impact measures. The inclusion of factual data collected through documentary evidence can reliably demonstrate changes in the land market caused by land use regulation.

4.3. Research Methods

This section focuses on the research methods adopted for the collection and analysis of the data, which is the innermost layer of the Research Onion discussed in the previous section. Figure 4-2 summarises the steps taken to achieve the research objectives. The figure indicates that a desktop review was performed to identify the research gaps, research problems, research objectives and questions. This review broadened the understanding of the land use–land market relationship and its theoretical foundations. It also explored land market assessment practices, identified key land market impact factors and addressed Objectives 1 and 2. The research methods adopted for the data collection, analysis and synthesis are described in upcoming sections.

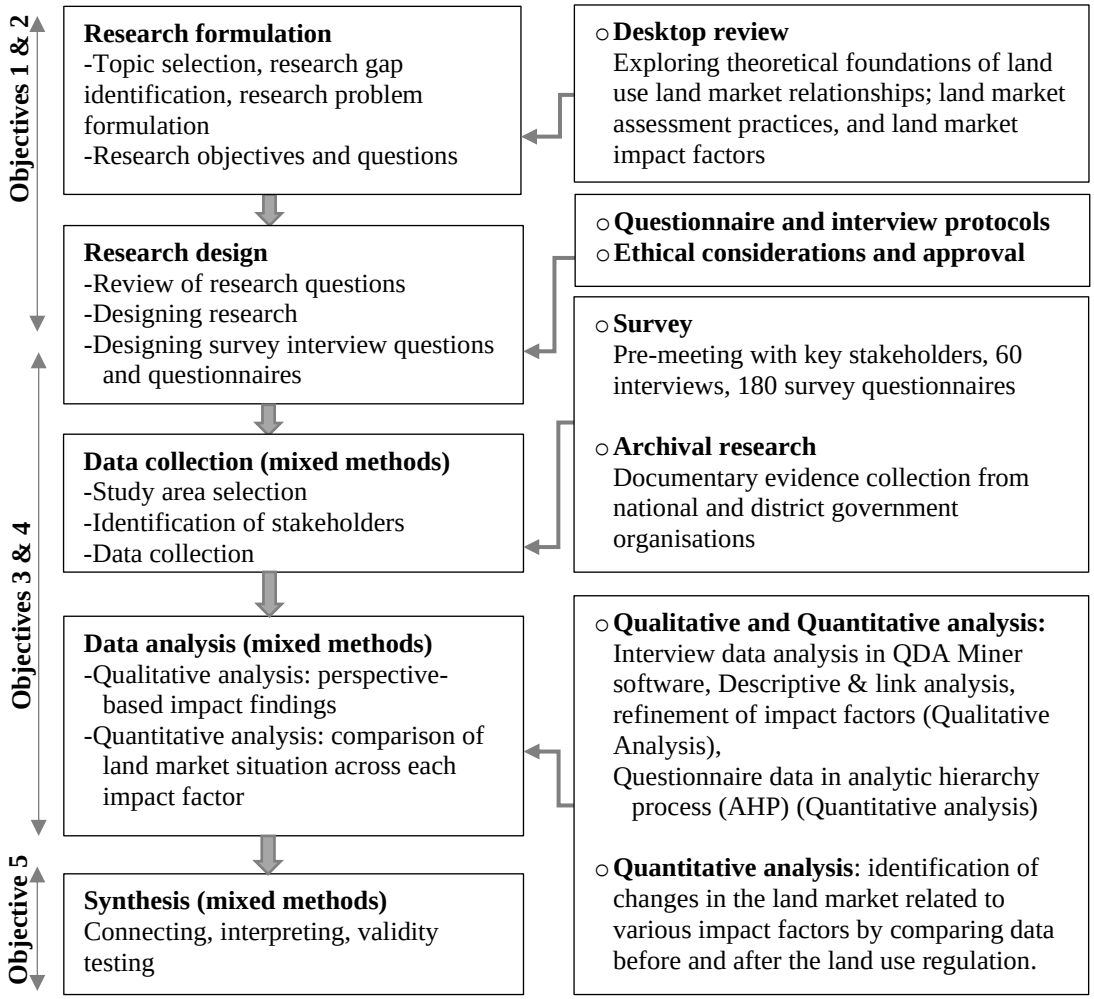


Figure 4-2: Research methods

4.3.1. Study Area Selection

The Kathmandu Valley of Nepal was selected as the study area as it is a representative case for this study (Figure 4-3). The Kathmandu Valley comprises the Kathmandu, Bhaktapur and Lalitpur districts and covers 19 local administrative units. The population of the Kathmandu Valley is approximately 2.5 million (CBS, 2017). There are nine land revenue and cadastral survey offices providing land transaction services within it. There are approximately 1.5 million landowners registered within the Kathmandu Valley (Ministry of Land Reform and Management, 2012a). It contains 23% of the total number of financial institutions in the country (Nepal Rastra Bank, 2019e) and around one-third of the country's economic activity occurs within the valley (Nepal Rastra Bank, 2012). Key government institutions such as ministries and departments, land professional organisations, and private land development agencies are located within the Kathmandu Valley.

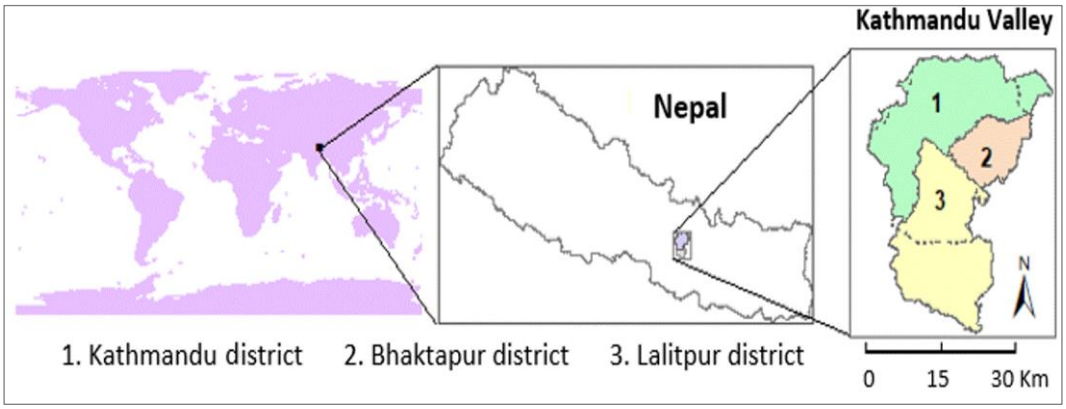


Figure 4-3: Study area

The Kathmandu Valley Development Authority (KVDA) is responsible for implementing land use-related activities, such as road and river zoning and urban planning within the valley area. Given the recent introduction of subdivision restrictions and lot size control, the valley also serves as a suitable study area for exploring land use restrictions where demand for residential land is anticipated to be very high. For these reasons, the Kathmandu Valley was chosen as the representative sample for identifying the impact of land use regulation on Nepal's urban land market.

4.3.2. Data Collection

Survey and archival research strategies were adopted to collect data for this research. Primary data was collected through interviews, followed by a questionnaire survey. Archival evidence in the form of government reports, statistics and records, and scanned images were collected as secondary research data. The initial field data collection was conducted between 14 June 2018 and 14 August 2018. Additional archival records and documentary evidence required for the quantitative analysis of the impact study were collected from the Department of Land Management and Archive through the Geographic Information Infrastructure Division, Survey Department, on 11–19 July 2020 and 7–17 December 2020. Data collection began with identifying the stakeholder organisations and research participants who would provide data for this research.

4.3.2.1. Stakeholder Identification

In this study, a stakeholder was defined as a person, a group of individuals or an organisation which can participate in the land market processes. According to the literature, landowners, cadastral and land registration organisations, real estate agencies, land developers, banks and financial institutions, and land professionals are key participants in a land market (Dale et al., 2006). The inclusion of stakeholders from both expert and non-expert groups broadens the participation space in a research study (Stirling, 2008). Campbell et al. (2020) discuss the non-probability purposive stratified sampling where specific kinds or groups of participants need to be included in the sample. As specific kinds of people may hold different yet important views about the ideas and issues at question, they should be considered in the data collection process. The possibility of grouping the participants based on proficiency and experience in the subject of interest was also discussed by Etikan et al. (2016).

Stakeholders can be identified by opening up their pre-existing networks (Leventon et al., 2016). The identification of stakeholders was initiated through a pre-meeting with officials from the Survey Department of Nepal, the key organisation for land use mapping and maintenance of the cadastral records in the country. Stakeholders were classified into three groups according to their role in the land market:

(i) The private and professional group: real estate agencies, private land and housing developers, local land experts, and surveying and engineering consultancies. Important agencies in this group were the Credit Information Bureau, Real Estate Agents Association Nepal, Nepal Land and Housing Developers' Association, Nepal Notary Public Council.

(ii) The institutional group: government agencies, including the ministry and departments that look after land registration and surveying activities, and land use mapping and implementation. Important agencies in this group were the Ministry of Land Management, Cooperatives and Poverty Alleviation, Survey Department, and the Department of Land Management and Archive.

(iii) The financial group included banks and financial institutions. Nepal Rastra Bank (the Federal Reserve Bank of Nepal) and Micro-Credit Enterprise (Cooperatives) were crucial organisations in this group.

The roles and positions of the participants were considered before including them in the data collection process. A minimum criterion was set to qualify participants for quality data collection. In the institutional group, the minimum criterion for the participants was that they must be at least a gazetted officer. A gazetted officer is the minimum qualification to be the officer-in-charge at the district level land revenue and survey offices in Nepal. A gazetted officer is responsible for locally implementing government-approved plans.

For the financial group, a participant was required to be at least either a loans officer or a branch manager of the bank. The loans officer can provide information about the changes in the loan-flow in the bank following the introduction of land use regulation. The manager is responsible for the overall management of the financial institution.

For the private land professional group, a participant must be a member of the executive committee or a manager of a land professional organisation.

The objective of the pre-meeting with survey department was only to identify stakeholders' organisations related to one of the identified groups in Kathmandu Valley. The following subsection describes the process followed for the selection of interview and survey participants in this study.

4.3.2.2 Selection of Participants

The literature suggests purposive sampling as an appropriate strategy for the selection of suitable respondents for qualitative research (Tongco, 2007; Palinkas et al., 2015; Etikan et al., 2016). Palys (2008, P. 697) discusses the suitability of purposive stakeholder's sampling in the context of evaluation research and policy analysis that "often involves identifying who the major stakeholders are who are involved in designing, giving, receiving, or administering the program or service being evaluated, and who might otherwise be affected by it". Tongco (2007) suggests asking for help on the site to find the appropriate participants. Therefore, a non-probability sampling approach was considered for the selection of participants for interview and survey in this research. The process of stakeholder identification was initiated through the pre-meeting with the experts of Survey Department.

Having finalised the list of the organisations through the pre-meeting with the officers of the Survey Department, support letters were prepared to request access to those organisations. Contacts with the participating organisations were made using the contact information obtained from open sources. A face-to-face meeting was organised with the executive of each of the organisations to discuss the purpose of the research and data requirements, and then to identify potential participants from the organisation. The potential participants were then met individually to discuss the objectives of the research. Those interested participants who were aware of the land use-land market situation in Nepal were then recruited for data collection. The discussions with the executives also helped to identify possible sources of data held by organisations.

McKinnon (1988) discusses the difference between an informant and an interviewee. An informant gives information about the general background of the organisation, the people and their role in it. In this case, the executive acted as an informant who designated personnel for the interview. Recruiting respondents through executives was helpful in selecting prospective respondents because they know their organisations better than their colleagues

The chained mode adopted in this study in identifying prospective interview and questionnaire respondents was based on non-probability purposive sampling that

began with identifying the relevant organisations, approaching their executives, identifying the participants, and then recruiting them into the data collection process.

In summary, the selection of participants was performed through the following steps:

- Review of literature to understand the broader level categorisation of land market stakeholders and formation of groups of stakeholders.
- Allocation of relevant stakeholders to a group.
- Consult with local experts to identify the existing stakeholder organisations in the study area
- Contact and meet with the executives of the stakeholder organisations to identify interview and survey participants
- Meet the potential candidate participant to discuss the research objectives of research and data collection.
- Fix the schedule for interview or survey data collection

4.3.2.3 Sample Size

Purposive sampling does not need underlying theories or a set number of participants because it is a non-random technique. Purposive sampling, also known as judgment sampling, offers the deliberate choice due to the specificity of roles, sectors and qualities the participant possesses (Etikan et al., 2016). The researcher identifies what needs to be collected and sets out to find participants who can and are willing to respond by knowledge and experience. The number of participants in a sample also depends on the number of groups of stakeholders. In the Nepalese land market, stakeholder organisations were identified through an initial pre-meeting with the officials of Survey Department. The pre-meeting identified 14 major organisations across the institutional group from the Ministry to local government agencies. Eight distinct stakeholder organisations were identified across the private sector group. To ensure redundancies in the data, 20 participants were selected with more than one participant from some of the organisations across institutional and private sector groups.

Although three distinct organisations type were identified within the financial group - Federal Reserve Bank, banks, and micro-credit enterprises, only the Federal Reserve Bank and national level commercial banks were selected for interview. There were 27

national level commercial banks in Kathmandu Valley (excluding their branches), only 19 could be selected for recruiting the interview due to the limited availability of respondents. Including one participant from the Federal Reserve Bank, there were 20 respondents from the finance group which was expected to produce enough redundancies in the data. In this way, 20 participants were selected for each group and the total number of participants for the interviews was 60. The equal number of participants in each group allowed homogeneity of the sample size. Table 4-1 shows organisations identified through the pre-meeting and the position and number of participants recruited through the purposive sampling method.

Using a similar approach, a different group of 180 survey participants were also identified to respond to a questionnaire. The stakeholder organisations and the position of participants across the institutional, private and financial groups recruited in the survey are enlisted in Appendix 18.

4.3.2.4 Interview Data Collection Process

An interview is a valid and reliable tool for qualitative data collection (Knapik, 2006). Based on the degree of formality, the structure of the questions and how the interview data is collected, the literature specifies various types of interview, especially structured, semi-structured, and unstructured (Phellas et al., 2011; Ekanayake, 2015).

Structured interviews use a predetermined and 'standardised' set of questions and are referred to as 'interviewer-administered'. Unstructured interviews are characterised by open-ended questions that allow the interviewee to give as much information as is required (Saunders et al., 2015). Semi-structured interviews are 'non-standardised'. In semi-structured interviews, the researcher employs a list of themes and questions to be covered although these may vary from one interview to the next. Most qualitative research interviews are semi-structured because this allows the researchers to set the agenda as per the research interests, while still leaving room for respondents to provide spontaneous descriptions and narratives (Given, 2008). A semi-structured interview allows the interviewer to consider all of a pre-defined agenda and thereby gives the respondents a degree of freedom to express their views without feeling they are being 'pressured' as they would in a structured interview.

As specified above in the research design, I adopted for this research a semi-structured interview approach. An interview guide consisting of a list of topics covered in the interview was distributed to each participant along with the schedule of the interview. Participant information sheet for interview was also provided with the interview guide (Appendix 1). The interview guide informed the interviewees of the questions to which they would respond and of the confidentiality of the information being sought from them by the interviewer.

Interviews were held at the premises of the Geographic Information Infrastructure Division (GIID), Survey Department, in Kathmandu. Managing time is crucial during the interview process as all interviewees are subject to time pressures (Ferreira and Merchant, 1992). In the first five minutes, a briefing on the investigator and research project was provided to the interviewee. As all participants had already received the interview guide, they were aware of the interview questions before presenting to the interview. The interviewees were asked the questions and their responses were audio recorded with their consent. Each interview took approximately half an hour. The data was stored as per the ethics approval requirements of the University of Southern Queensland (Approval no. H18REA064). The interview data were transcribed, coded and analysed to identify the key factors affecting the Nepalese land market. The interview-identified key factors were then compared with the preliminary impact factors identified through the literature review to refine a set of land market impact factors and indicators. The refined set of impact factors and land market indicators was used to finalise the questionnaire set to be launched in the second stage of the primary data collection.

4.3.2.5. Questionnaire Survey Data Collection Process

Stakeholders' perspectives on the changes in the land market associated with each impact factor across the economic, social, environmental and institutional dimensions were collected through the questionnaire survey. These impact factors were primarily based on the literature review and were further refined through the interview process described above. Participant information sheet for questionnaire survey was provided to the participants to provide the general information about the survey (Appendix 3).

The questionnaire captured the impact rating for the changes associated with each impact factor in the land market as perceived by the respondents. The respondents were asked to assign an impact score—positive, zero or negative—corresponding with their observations and experience of the changes that had occurred in the land market. It was expected that the stakeholders from each group would not have the same perception of the importance of the impact factors and so the questionnaire also asked the participants to rank the impact factors and their dimensions. The ranking was later used to derive impact indices that would indicate the impact of land use regulation on the land market.

Paper copies of the questionnaire were personally distributed to each participant across each group. None of the survey participants overlap with interview participants. The purpose of the survey was explained to each participant individually and the structure of the questionnaire was clarified to avoid any confusion. The timeline for the participants to complete their questionnaire responses was three weeks. At the end of the second week, each respondent was contacted to confirm whether they had completed the questionnaire or if they needed any further explanation or clarification. This follow-up contacts also ensured an improved response rate and ensured that respondents would return the questionnaire within the requested period. At the end of the third week, the questionnaire was collected from each respondent by visiting them face to face. The response rate of the survey was 100% from all 180 questionnaire respondents.

The questionnaire was divided into three sections: A, B and C. The questionnaire fully covered the objective questions.

Section A consisted of seven questions which identified participants' general awareness of the implementation of land use regulations in Nepal. Of these seven, five questions were to identify whether the participants were aware of the land use policy, regulations, restrictions, implementation strategies and their impact on the land market (Q1–Q6). The question Seven (Q7) sought to identify those strategies that affected the land price.

Section B, broadly covered by Question 8, asked 72 questions in total. The questions were distributed through hierarchically subdivided groups and subgroups based on

dimensions, impact factors and indicators to avoid confusing the questionnaire respondents. Firstly, four groups of questions were based on the economic (8.1), social (8.2), environmental (8.3) and institutional (8.4) dimensions. Each dimension was further sub-grouped by impact factors. The economic dimension was sub-grouped into five parts: Transaction Cost (8.1.1), Valuation (8.1.2), Mortgage Availability (8.1.3), Taxation (8.1.4) and Compensation (8.1.5). The social dimension was subdivided into three parts: Awareness (8.2.1), Expectation (8.2.2) and Proximity (8.2.3). The environmental dimension was subdivided into three parts: Risk Reduction (8.3.1), Quality of Residential Land (8.3.2) and Suitability of Zoning Classification (8.3.3). The institutional dimension was divided into three parts: Lot Size (8.4.1), Subdivision Restrictions (8.4.2), and Coordination (8.4.3). Each impact factor was further sub-grouped based on the impact indicators. The topics of the questions associated with each impact indicator are given in Table 4-1 below.

Table 4-1: Impact factors and indicators used in the survey data collection

Dimension	Impact Factor	Questions related to indicator in questionnaire
8.1 Economic	8.1.1 Transaction Cost	Q8.1.1.1 Changes in the cost of transaction
		Q8.1.1.2 Changes in the time of transaction
	8.1.2 Valuation	Q8.1.2.1 Changes in the price of residential land
		Q8.1.2.2 Changes in the price of agricultural land
		Q8.1.2.3 Price speculation due to land categorisation or subdivision restriction
		Q8.1.2.4 Change in landowners' financial capability due to changes in the land value
	8.1.3 Mortgage Availability	Q8.1.3.1 Changes in the financial strength of the financial institutions
		Q8.1.3.2 Changes in the number of landowners receiving the loan
		Q8.1.3.3 Capability of the landowners to repay the loan
	8.1.4 Taxation	Q8.1.4.1 Changes in Transfer Tax
		Q8.1.4.2 Changes in Annual Land Tax
		Q8.1.4.3 Changes in Capital Gains Tax
		Q8.1.4.4 Penalties for not using the land
	8.1.5 Compensation	Q8.1.5.1 Sufficiency of the compensation paid against the loss due to subdivision restriction
		Q8.1.5.2 Sufficiency of compensation against loss due to road expansion
		Q8.1.5.3 Time required for the payment of compensation
		Q8.1.5.4 Sufficiency of subsidies
8.2 Social	8.2.1 Awareness	Q8.2.1.1 Conflict between sellers and buyers due to lack of awareness of land use regulation
		Q8.2.1.2 Dispute between clients and staff over failure of parcel subdivision
	8.2.2 Expectation	Q8.2.2.1 Ease of the subdivision approval process
		Q8.2.2.2 Number of court order cases for subdivision approval
	8.2.3 Proximity	Q8.2.3.1 Satisfaction of landowners due to distance to the workplace
		Q8.2.3.2 Changes in the number of landowners/buyers in the land market
8.3 Environmental	8.3.1 Risk Reduction	Q8.3.1.1 Changes in the flood-risk area in the Kathmandu Valley
		Q8.3.1.2 Changes in the road space across the Kathmandu Valley
	8.3.2 Quality of Residential Land	Q8.3.2.1 Supply of residential land with added open space in land pooling areas
		Q8.3.2.2 Change in land value of quality residential plots compared to surrounding unplanned areas
	8.3.3 Suitability of Zoning Classification	Q8.3.3.1 Sufficiency of land allocated for non-agricultural purpose
		Q8.3.3.2 Changes in the amount of housing construction in agricultural land of Kathmandu Valley
8.4 Institutional	8.4.1 Lot Size	Q8.4.1.1 Number of available parcels qualifying for market transaction
		Q8.4.1.2 Changes in the transaction volume
	8.4.2 Subdivision Restrictions	Q8.4.2.1 Changes in the quantity of parcels subdivided
		Q8.4.2.2 Accessibility to the adjoining parcel to use for road purpose (Ease of the use of land)
		Q8.4.2.3 Number of informal transactions
	8.4.3 Coordination	Q8.4.3.1 Number of private lots affected by the road expansion
		Q8.4.3.2 Number of court cases registered against the KVDA to secure property rights
		Q8.4.3.3 Changes in the zoning certainty

Section C covered four questions which focused on collecting the rankings of dimensions and impact factors (Q9, Q9.1, Q9.2, Q9.3). It first asked respondents to assign a rank score to an alternative from each pairwise set of dimensions, as presented in the Rank Allocation Table (Table 4.2), and then to the impact factors.

Table 4-2: Rank table used to gauge the importance level of alternatives

Dimension	is … more important than								is equal to	is … less important than								Dimension
Institutional	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Economic
Institutional	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social
Institutional	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental
Economic	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social
Economic	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental
Social	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental

Collection of the responses to the impact scores was based entirely on the indicators specified in Section B of the questionnaire. For each impact indicator, two questions were asked. The first question asked the respondent to choose one of the alternatives from the group of three to indicate changes in the land market. The second question asked the respondent to assign an impact score from the range of +3 to −3 to reflect the degree and direction of the impact on the land market (Appendix 4).

Ranked data identifying the importance level of dimensions and impact factors was collected in a separate Rank Allocation Table (RAT). Each row of the RAT consisted of a pair of items to be ranked relatively, one in the first column and the other in the last column (See Appendix 4). There were four separate RATs for the ranking of impact factors across each of the four dimensions.

The total number of rows in a RAT was determined by calculating the combination of items to be ranked pairwise. For the ranking of dimensions, the total number of paired combinations in the priority matrix was ${}^{4}C_{2} = 6$. Consequently, all six possible paired combinations of dimensions were formed and placed in the rank table (Table 4-2). The rank score collected in each RAT was based on the data scale 9–1 (highest to lowest rank), as shown above in Table 4-2 The central column of the RAT shows equal importance. The left side specifies the higher rank scores, whereas the right side specifies the lower rank scores (see Appendix 4 for the question asked, Q9).

A similar pattern of questions was asked for ranking each pair of impact factors across each dimension. The responses were then transferred to the computer for analysis.

4.3.2.6. Archival Research Data Collection

Documentary evidence in the form of archived records was collected from various government agencies. The University of Southern Queensland provided a recommendation letter clarifying the purpose of the field visit to Nepal. The Survey Department provided a letter of support to ensure access to the data from key organisations. Executives of the organisations were contacted to arrange a meeting regarding data availability and accessibility. Available archival data reflecting the changes that had occurred in the land market and the relevant identified impact factors were collected in the form of reports, archived tabular records, statistics, images, charts and letters. Table 4-3 summarises the data collected and the source organisations.

Most of the data collected were in the form of hardcopy documents, except that on mortgage availability collected from Nepal Rastra Bank (NRB), the land transaction data collected from the Department of Land Management and Archive (DOLMA), and the cadastral maps from the Department of Land Information and Archive (DOLIA). Government circulars and policy decisions regarding land use implementation were collected in hardcopy format. The Geographic Information Infrastructure Division (GIID) supported the collection of consolidated statistics about the transacted prices and estimated prices through Kathmandu Valley's District Land Revenue Offices. District Survey Offices supported the collection of the secondary data, especially from the district courts of Kathmandu, Lalitpur and Bhaktapur. The collected data were reviewed and entered digitally into Microsoft Excel for further comparative analysis.

Table 4-3: Summary of the required secondary data and their sources

Data relating to	What was collected	Data type	What to identify	Data sources
Valuation	-Land transaction records of 2500 parcels consisting of transacted land price and corresponding area of transacted parcel and other spatial attributes	Quantitative and Qualitative	-Changes in land value -Shift of demand curves of land before and after the land use restriction.	Survey Department (SD) and DOLMA.
Mortgage Availability	-Loan-to-Value ratio and Fair Market Value ratio for at least two years before and after the introduction of land use restrictions -Amount of loan acquired by the real estate and residential housing sector 2013–2019. -Non-performing loan statistics 2015–2019 -Number of backlisted borrowers 2013–2019 -Number of total loan account holders 2015–2019, and real estate and residential and housing loan borrowers	Quantitative and Qualitative	-Changes in LTV, FMV. -Changes in the loan for real estate and residential housing. -Changes in the non-performing loan in BFIs/ Strength of BFIs. -Association between the loan availability, non-performing loan and blacklisting of borrowers. -Changes in the number of real estate and residential housing loan borrowers.	Nepal Rastra Bank, Credit Information Bureau (CIB)
Transaction Cost	- Civil Citizen Charters available at Lalitpur Land Revenue and Survey Offices -Records of transaction process from LROS and SOs, and time and cost required for these processes and steps	Quantitative and Qualitative	-Changes in the transaction time and cost.	SO, LROs of Kathmandu Valley
Taxation	-Total revenue collected from 2011-12 to 2018-19 -Penalties rate and penalties paid for no use or misuse of land -Annual Land Tax - Transfer tax paid by landowners during the transaction and transfer tax rate.	Quantitative	-Changes in revenue collection, annual tax and penalties for no use of land, changes in the transfer tax rate.	DOLMA Municipalities
Compensation	-Digital cadastral boundary of Kathmandu Metropolitan City -Digital road boundary data developed by KVDA. -Land acquired by KVDA for road expansion after the introduction of *National* Land *Use Policy 2012*. -Data/records regarding the value of the land set by KVDA and compensation paid for the acquired land.	Spatial data, Quantitative and Qualitative data	-Value of the land acquired by KVDA. -Amount of compensation paid to landowners for the land acquired.	SD and KVDA

Data relating to	What was collected	Data type	What to identify	Data sources
Awareness	-Number of court case related to the exchanges of property and the number of court cases related to the advance payment of land purchase 2013–2019. -Number of parcels subdivided through court orders for parcels on the joint ownerships -National Directives for the Distribution of Digital Data.	Quantitative and Qualitative	-Social conflict/court cases due to lack of awareness of land use restriction -Policy provision for restricting the data availability	-District courts in the Kathmandu Valley. -SD/ SOs of Kathmandu Valley. MOLMCPA.
Expectation	-Number of court cases related to property inheritance. -Number of parcels subdivided through family inheritance. - Number of divorce cases registered in the courts. - Number of parcels subdivided related to divorce cases.	Quantitative and Qualitative	changes in the number of parcels subdivided through inheritance and divorce cases Number of court cases related to inheritance and divorce in courts	District courts in the Kathmandu Valley. SD and SOs.
Proximity	-Number of households identified for resettlement vs number of resettled households, districts and settlement name. -Distance of relocation (resettlement) areas from the previous dwelling.	Quantitative and Qualitative	-Changes in the land market participant from the local market -Satisfaction or dissatisfaction of landowners	NRA
Risk Reduction	-Slope map, flood hazard map, land use map of the Kathmandu valley. -Number of land pooling projects in the flood-protected land of Kathmandu Valley and number of released plots. -Cadastral boundary shapefiles data.	Quantitative and Quantitative. Spatial	-Area of different land use vs average (overlay analysis) -Number of flood-protected parcels supplied -Areas protected from flood (GIS analysis)	DWIDP SD KVDA
Quality of Residential land	--Comparison of the average open space in Kathmandu Valley and the average open space availed at land pooling project areas. -Changes in the number of land development projects that supply the quality residential plots across Kathmandu valley after the introduction of land use regulation.	Quantitative	-Environmentally safer vs riskier	MOUD, KVDA, DUDBC
Suitability of Zoning Classification	-Number of land use categories in practice vs number of zones implemented. -Area of residential land required vs area of land allocated for residential purpose. Number of approvals for housing vs transaction volume.	Qualitative and Quantitative	-Changes in the land available for a household after the implementation of land classification.	SD; KVDA SRTM Nepal Rastra Bank

Data relating to	What was collected	Data type	What to identify	Data sources
Coordination	-Cadastral boundary; road expansion boundary. -Number of court cases against the road expansion for the security of property rights. -Number of conflicting plans prevailing in the Kathmandu Valley.	Spatial data, Quantitative and Qualitative data	-Ambiguity in coordination mechanism -Zoning uncertainty/lack of coordination -Changes in the property violation cases	Municipality, LROs KVDA, SD, DOLMA
Subdivision Restriction	- MOLRM's Notice on the implementation of subdivision restriction. -Number of applications awaiting subdivision for the road expansion for the same years.	Quantitative and Quantitative	-Changes in land availability, accessibility	DOLMA SOs
Lot Size	- KVDA's Notice on the implementation of lot size control -Digital cadastral data on the new town development area. -Number of parcels available for subdivision in New Town Development Area (before and after the lot size control).	Spatial Quantitative and Qualitative	-Changes in land availability, accessibility	DOLMA

4.3.3. Data Analysis

4.3.3.1. Determining the Impact of Land Use Regulation on Land Market from Stakeholders' Perspective

Determining the impact of land use regulation on the land market through stakeholders' perspectives first required the refinement of the land market's impact factors. This was achieved through by analysing the interview data and is discussed below. The refined impact factors were then used in the survey questionnaire. The survey results were analysed to rank the impact factors and to determine the overall impact of land use regulation across the various dimensions of the land market. The approach to this analysis is discussed below and detailed further, together with the results, in Chapter Five.

4.3.3.2. Refining the Impact Factors

To refine the proposed land market impact factors, each of the transcribed interviews was analysed using Qualitative Data Analysis Miner (QDA Miner). Qualitative data analysis involves processes of data reduction, classification, and interpretation (Lillis, 1999). Miles and Huberman (1994, p. 10) suggest an applicable systematic analytical

protocol comprising three sequential activities: data reduction, data display, and conclusion-drawing and verification.

Data reduction is the process of selecting, analysing, simplifying, abstracting and transforming relevant data from a set of collected raw data (Miles and Huberman, 1994).

I used a deductive approach in the overall analysis of the interview data in this research. Recorded interviews were first transcribed into text format and saved as individual files, then reviewed and checked for any transcription errors. Data codes were established based on their thematic alignment to an identified dimension namely: economic, social, environmental or institutional. Data coding was then performed in the QDA Miner; each transcribed document was scrutinised for the data themes and then coded. Coding helped consolidate the data and categorise it into different thematic classes.

QDA Miner allowed the identification of recurring codes in the transcribed data set and performed link analysis on the coded data to generate its clusters. The 'Analyse tool' available in the QDA Miner allows a range of data analysis option such as coding frequency analysis, co-occurrence analysis etc, visualisation of frequency distribution and clusters (Figure 4-4 and Figure 4-5).

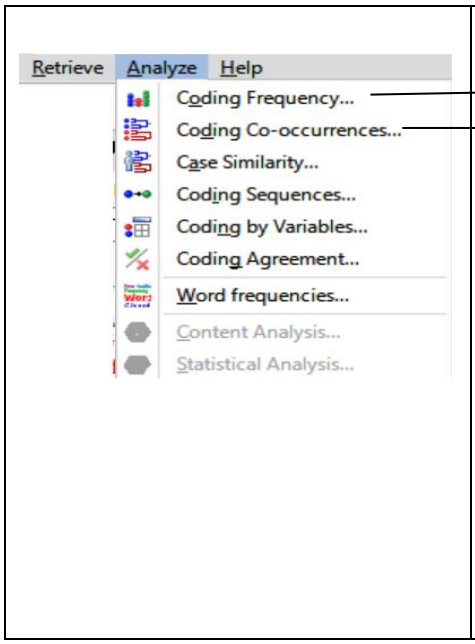


Figure 4-4: Data Analysis Tool available QDA Miner Software

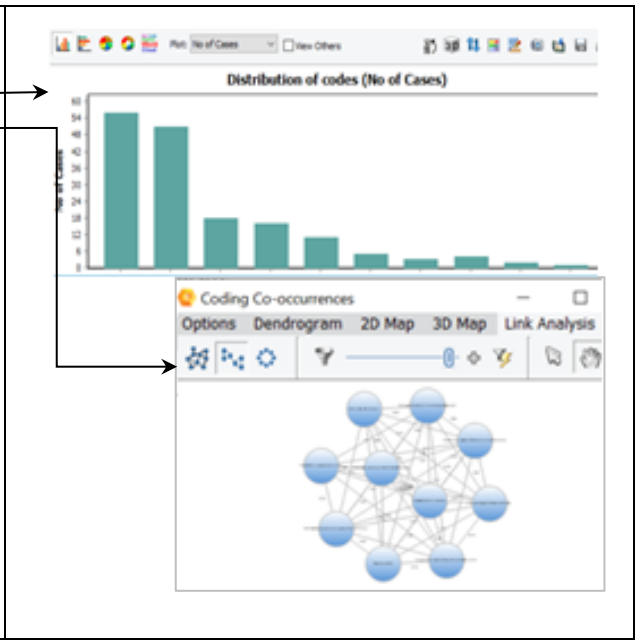


Figure 4-5: Visualisation of Codes in QDA Miner Tool

The recurrences of codes in any given cluster were examined through frequency analysis. The software assists in defining an initial set of codes and locating recurring words and phrases associated with these codes. Computer-based analysis is limited to the statistical distribution of codes including the calculating of the measure of centrality or the standard deviation etc. but, cannot itself categorise, or derive the concept that can be revealed from within the data. Yin (2009, P. 128) emphasises the need of the further interpretation of the computer-derived output to derive the themes.

Identifying themes originating from a set of data is an iterative process that involves frequency analysis and transformation of clustered qualitative data into a theme in a broader context (Boyatzis, 1998).

Recurrences of codes and their clusters were further scrutinised to identify what they indicate in a broader context. This stage required data interpretation in three stages that ultimately resulted in defining a representative theme (key message) associated with each cluster.

4.3.3.3. Ranking of Impact Factors and Determining Overall Impact on the Land Market

The rank and impact score data collected through the questionnaire were analysed using an analytic hierarchy process (AHP). The interview results had already identified the hierarchical relationship between the dimensions, impact factors and impact indicators. They were treated as the hierarchical components of AHP. The findings from the interviews helped to define the criteria for the land market assessment.

Using the criteria of the impact measurement, the Nepalese land market impact scenario was framed in a hierarchical structure of alternatives. I followed the four-step approach of AHP to derive the impact index across the four dimensions of the land market (Figure 4-6): the decomposition of the land market impact scenarios into hierarchical alternatives; ranking of the alternatives; prioritisation or derivation of the weight of each alternative; the synthesis of the weight with the impact score given for the changes that had occurred in the land market. Each step is discussed in the following subsections.

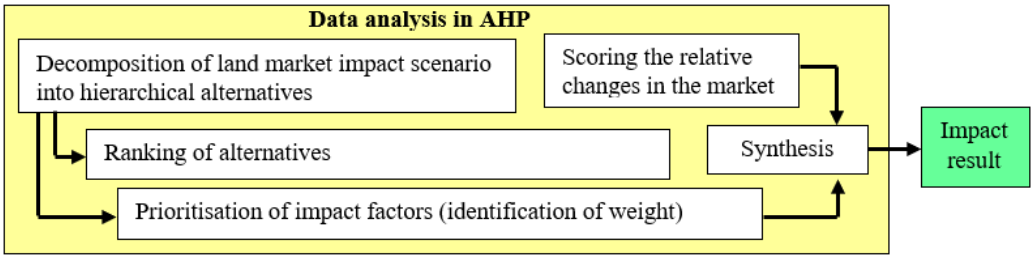


Figure 4-6: Steps followed in AHP for the land market assessment

Step 1: Decomposition of the land market impact scenarios

Based on the criteria for measuring the impact on the land market across the various impact factors associated with the social, economic, environmental and institutional dimensions, a hierarchical structure for measuring the impact was developed that comprised dimensions, impact factors and impact indicators (Figure 4-7). The four dimensions of impact on the land market were at the top level, and the corresponding impact factors were at the intermediate level. The dimensions and the impact factors are called the 'impact alternatives' because the land market is affected across these dimensions through these impact factors. The land market indicators reflecting changes in the land market were placed at the bottom level.

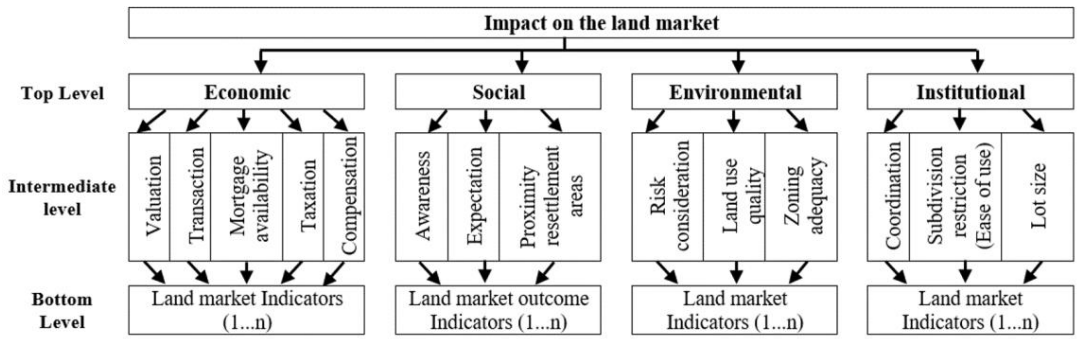


Figure 4-7: Hierarchical arrangement of alternatives in AHP

Step 2: Comparison of alternatives (ranking)

Using the survey data provided for each paired comparison by the respondents in the Rank Allocation Table (Table 4-2), the average rank was calculated. The geometric mean was taken as the representative average because it overcomes the tendency of the arithmetic mean to overestimate and that of the harmonic mean to underestimate the average rank value.

Step 3: Prioritisation of alternatives

Next, the ranked alternatives were prioritised through the identification of weights. First, the pairwise comparison matrix of the average rank was formed (Table 4-4, left) with the average ranks (r_1 ... ... r_n). The upper half of the matrix consisted of the calculated average ranks, and the lower half the symmetric reciprocal values. Each cell in the matrix was then normalised by the total of each column. The average of the normalised rank in each row produced the relative importance or weight (W_d) of each dimension (Table 4-4, right).

Table 4-4: Summary of pairwise comparison matrix of ranks of the alternatives

***Dimension**	Ec	Soc	Env	Ins	Sum of the normalised rank by total of each column	Weight
Ec	**1**	r_1	r_2	r_3	Sum of normalised cells = Sr_1	$W_1 = Sr_1/4$
Soc	$1/r_1$	**1**	r_4	r_5	Sum of normalised cells = Sr_2	$W_2 = Sr_2/4$
Env	$1/r_2$	$1/r_4$	**1**	r_6	Sum of normalised cells = Sr_3	$W_3 = Sr_3/4$
Ins	$1/r_3$	$1/r_5$	$1/r_6$	**1**	Sum of normalised cells = Sr_4	$W_4 = Sr_4/4$
Total	Sc_1	Sc_2	Sc_3	Sc_4		

Pairwise comparison matrix

Normalisation and weight calculation

*Ec: Economic; Soc: Social; Env: Environmental; Ins: Institutional

The calculated weights were checked for their consistency by calculating the consistency ratio (CR). CR is the ratio of the consistency index (CI) to the random index (RI) (Saaty, 1983). CI is calculated by deriving the largest Eigenvalue (λ_{max}) of the comparison matrix and is given by,

$$CI = \lambda_{max} - n/(n\text{-}1) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

Equation 4-1: Consistency index calculation

RI is derived from the random index table for the values *n*. The weights of the impact factors (W_i) associated with each dimension were derived using the same methods. However, the local weight was only effective within the dimension with which it was associated. Therefore, for an overall comparison, I derived the composite weight (C_{Wi}) as the product of the weight of a given dimension (W_d) multiplied by the local weight of the impact factor associated with that dimension (W_i), as illustrated in the equation (4-2).

$$C_{Wi} = (W_d) \text{ X } (W_i) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

Equation 4-2: Calculation of composite weight of an impact factor across a dimension

Step 4: Identification of the impact on the land market

Finally, the impact of the land use regulation on the land market was calculated by adopting an approach similar to Dey (2002). The impact calculation procedure is given below.

If v_i is the rating ($-3 \leq v_i \geq 3$) assigned by a respondent in their response to represent the relative changes produced by an impact indicator associated with an impact factor, then the average rating perceived for that indicator was calculated by:

$R_{avg} = \frac{\sum_1^n v_i}{n}$, where *n* is the total number of respondents (1, … *n*).

The mean impact score rating at the impact factor level can be obtained by calculating the mean of the average score rating derived for each indicator. The mean impact score for each impact factor (R_{mis}) is calculated as:

$R_{mis} = \sum_1^m (R_{avg})/m$, where *m* is the number of indicators associated with the impact factor under consideration ... … … … … … … … … … … … …

Equation 4-3: Mean impact score at the impact factor level

The land market impact associated with each impact factor (I_{imf}) was calculated by multiplying its composite weight (C_{Wi}) with the corresponding mean impact score (R_{mis}),

i.e., $I_{imf} = (C_{Wi}) * R_{mis}$…… … … … … … … … … … … … …

Equation 4-4: Impact derivation at the impact factor level

Having calculated the impact associated with each impact factor, the total impact on the land market across a given dimension is given by:

$I_{imd} = \sum_1^t (I_{imf})$, where *t* is the total number of impacts across a given dimension

Equation 4-5: Impact derivation at the dimension level

4.3.3.4. Review of Archival Evidence to Determine the Impact on the Land Market of Land Use Regulation

An archival research strategy allows research questions that address changes over time and can be applied to any exploratory, descriptive or explanatory research (Saunders

et al., 2019). This implies that changes in the land market over time can be explored through the investigation of data derived through the archival records held by the responsible public organisations. Adopting archival research minimises the response biases of researchers because the researcher does not become involved while the data is collected (Ventresca and Mohr, 2017).

An archival research strategy incorporates a broad range of activities applied to facilitate the investigation of documents and textual materials deposited in an archive by and about organisations. Archival methods commonly involve the study of historical documents that are created at some point in the relatively distant past. These documents are not confined to the qualitative set of records but can be utilised to extract a set of quantitative information (Given, 2008).

Understanding the world or reality as an orderly set of functions is not always possible, as discussed by postmodernists (Mills and Mills, 2018). This is particularly true when the phenomenon under study deals with cases that entail multiple criteria and factors, as in this study, which rests on the philosophy of subjective ontological pragmatism. The qualitative part of the pragmatic approach adopted in this study incorporates interview data collection, which then adopts survey for the collection of quantitative information. The perspective-based information collection was therefore mixed with interview and survey; however, the quantitative part in the second phase sought to check whether those findings confirmed, contrasted, contradicted or informed the actual situation of the land market. A temporal set of quantitative data from various sources for multiple themes could be acquired from archival documents, which would help address the data need. Such a data set would allow identification of changes in the land market over time.

A comparison of the land market situation before and after the introduction of land use regulation requires data from pre- and post-regulatory periods. Kasanga et al. (1996) adopted key informants' interviews and secondary data investigation techniques to study the land market and legal conflicts in the peri-urban area of Accra, Ghana. The identification of impact on the land market cannot rely only on the responses of the land market stakeholders in the context of the introduction of land use regulation but also on the documentary evidence pertaining to the changes that have occurred in the land market (Dowall, 1995). Stakeholders can have their own vested interests, which

may lead them to provide biased responses. Land market impact assessment based on the stakeholders' judgements may therefore cast doubt on the validity and credibility of the impact measures. This calls for the collection of documentary evidence or secondary data that would show the changes in the land market caused by the land use regulation. Yin (2014) specifies six sources for the collection of evidence for a case study, in which documentation and archival records respectively occupy the first two positions in the list. Apart from filling the gap created by data need, an archival strategy also supports the validation or triangulation of results obtained during other phases of the research. Depending on the diversity in factors, the sources and type of the archival data may vary to a great extent. I used archival records and document-based evidence to identify the impact of land use regulation on the Nepalese land market.

4.3.3.5. Archival Research Data Analysis

The secondary data collected for identifying the impact of land use regulation on the land market differ in theme and type. The units of measurement of the data also differ across the theme. Identification of changes across economic, social, environmental and institutional dimensions was performed by comparing the market outcome associated with each of the impact factors across that dimension. The analysis of the archival research data as summarised in previous Table 4-3 is detailed for each dimension below.

Economic dimension

Identifying changes in the land market across the economic dimension through the use of documentary evidence and archival data was carried out by comparing changes in the land value, mortgage availability, transaction cost, taxation, and sufficiency of compensation after the implementation of the land use regulation. *Land Use Policy 2015* specifies the implementation of land tax based on the land use type. A comparison of the transfer tax rate before and after the introduction of land classification as per the ministerial decree of 2017 (Government of Nepal, 2017b), subsequent changes in the annual tax rate, and the transfer tax paid by landowners was examined. Land revenue collected by the state governments during the land transaction also reflects the changes in the land market. *Land Use Policies 2012/2015* and the *Land Use Act 2019* specifies penalties for no-use or misuse of land. The penalties

enforced before and after the introduction of land use regulation and the penalties amount collected was examined in the land market.

Previous studies indicate that introducing a land use regulation changes land value (Dowall, 1992; Ihlanfeldt, 2007; Lees, 2018a). Changes in the median land value calculated from the representative sample data identify whether the land value changed after introducing land use regulation. The demand curves for three years—two years before and one year after the introduction—will be generated to analyse changes in land demand after the introduction of land use regulation.

To identify the changes in mortgage availability, data from Nepal's Federal Reserve Bank was utilised. There are several determinants of mortgage availability, such as government regulations, central bank monetary policy, credit-to-deposit ratio, capital adequacy ratio, loan-to-value ratio, and level of non-performing loan (Timilsina, 2014). Panta (2018, P. 153) states, "The failure of banks in Nepal is also the result of the high non-performing assets and the result of lending without differentiating markets, products, and borrowers' creditworthiness and excessive loan exposure to real estate". Isolating the effects of land use regulation on mortgage availability is a complex issue that can be a separate subject of study. This study examines changes in the fair market value ratio, loan-to-value ratio defined for real estate and residential housing, changes in non-performing loans, changes in loans issued for real estate and residential housing, and changes in blacklisted borrowers before and after the enforcement of subdivision restrictions and land classification in 2017. The association of changes in the real estate and residential housing loan with the non-performing loan and blacklisted borrowers was examined.

Changes in transaction cost were analysed with the data related to the time required for the completion of the land transaction before and after the introduction of land use regulation. Regarding the impact associated with the impact factor *compensation*, the land use implementation activities performed after the approval of the *National Land Use Policy 2012* was explored. Among the activities related to the implementation of land use regulation are the road expansion programs implemented by the KVDA across the Kathmandu Valley (Kathmandu Valley Development Authority, 2015a; Shrestha, 2015) and the subdivision restriction by the then Ministry of Land Reform and Management (Government of Nepal, 2017b; Rimal, 2018) which have drawn the

attention of the courts (Rimal, 2018; Kamat, 2019). Comparison of the total value of the private land acquired for road purposes with the compensation paid helped identify the sufficiency of compensation provided to the affected landowners. Payment made by the government for loss caused by the subdivision restriction or land classification was reviewed. Government records and media reports were reviewed to examine whether the landowners were paid adequate compensation following the loss due to the enforcement of land use regulation.

Social Dimension

The *National Land Use Policy 2012* mandated that implementing authorities should raise awareness about the policy provision, its implementation, and potential impact. Lack of awareness of land use regulation creates conflicts and hinders the implementation process. Sairinen (2004) discussed the content and importance of social impact assessment while discussing the impact of urban land use plans. Burdge (1999) identified conflicts between residents and newcomers, and individual- and family-level impacts among 26 variables related to Social Impact Assessment (Sairinen, 2004). In this study, the number of court cases related to the conflict between buyers and landowner arising from a lack of awareness of land use restriction was compared, as well as land dispute cases related to the joint ownership of land. Government documents specifying that the lack of awareness of land use regulation created conflict, and court cases, were reviewed.

Stakeholders do not expect inefficient land transaction process as an outcome of policy intervention. Various options available for the acquisition of subdivision approval were explored. Court cases that compelled many landowners to go to court to pursue subdivision approval were compared. Changes in the number of parcels subdivided through family inheritance and divorce cases before and after the introduction of land use regulation were analysed. Government documents specifying that the land use regulation created conflict and split many families in Nepal was reviewed to identify whether they inform the quantitative analysis result.

Relocation or resettlement of households in the landslide hazards areas is one of the reasons for amending the *Land Use Policy* from 2012 to 2015. Identifying areas free from landslide hazards at a shorter distance may not always be possible, particularly

in the hilly areas of Nepal. Literature includes 'distance' as a compromising factor that allows the selection of land for a reasonable value (Alonso, 1960). While distance can be one of the determining factors of land value (El-Barmelgy et al., 2014), it can also be a satisfying or dissatisfying factor for land market stakeholders.

Apart from the role of 'distance' as a factor of social satisfaction, it can also be viewed as a factor that can change the number of land market participants. Relocation at a long distance may change the number of land market participants because people also need to leave their closer property while they shift from one local jurisdiction to the other. A quantitative difference in the number of households recommended for relocation and those already relocated was calculated. Association of the average relocation distance and the number of households relocated, and those remaining to be relocated, were analysed by calculating the correlation coefficient.

Environmental Dimension

Land use policy in Nepal mandates that government reduce natural hazards such as floods, landslides and earthquakes (Government of Nepal, 2012, 2015b). Burby and Dalton (1994) argue that land use planning limits the availability of land by delineating boundaries of hazardous areas. However, at the same time, such planning helps to supply the risk-reduced plots to the land market. The Government of Nepal performed river training and embankment construction works at various sections of the rivers to reduce flood-risks in the Kathmandu Valley, as discussed in the Chapter Three. GIS overlay analysis of spatial flood models and cadastral parcel boundaries was performed to identify the number of cadastral parcels protected by the flood control works. Land development projects executed after flood control activities showed the number of risk-reduced plots supplied in the Kathmandu Valley. Slope analysis was performed using the Open Sourced SRTM Digital Terrain Model to derive a reclassified slope layer. GIS overlay analysis using the slope re-classified data and the land utilisation map of 2015 to help to identify land categories across different slope classes. GIS analysis was carried out to determine the quantity of agricultural land above slopes of more than five degrees which are excluded for commercial real estate activities as per the classification system enforced.

Land development projects run by local government agencies and private developers are the major sources of quality residential plots in the land market of the Kathmandu Valley (Kathmandu Valley Development Authority, 2015b; Neupane, 2015; Faust et al., 2020; Neupane, 2020). Land use planning adopts standards for residential land development to ensure the availability of open space, roads and utility services, which increase land value in the land market (Karki, 2004). The availability of open space is one of the criteria required by KVDA in land readjustment projects in Nepal (Faust et al., 2020). Comparison of average open space usually available in the nonplanned urban areas of Kathmandu valley and those in land development areas showed the difference in the quality of residential land between planned and unplanned areas in the Kathmandu Valley. The difference in the land value effected by the quality enhancement was identified based on documentary evidence. Changes in the number of land development projects after introducing land use regulation was observed. Changes in land development projects also indicate the corresponding changes in the supply of quality land in the land market.

The suitability of zoning classification was examined by analysing changes in the availability of residential land for a household using the data collected from KVDA. Changes in the number of approvals granted for housing construction after the enforcement of land classification and subdivision restrictions was observed.

Institutional Dimension

Across the institutional dimension, documentary evidence and archival data were used to identify whether the land use regulation changed land availability, land accessibility and any property violation cases related to the implementation of land use regulation. The literature discusses tensions between private property rights and public planning or the effect of land use regulation on property rights (Enemark, 2009a; Jacobs, 2010; Williamson et al., 2010; Miljkovic and Vesna, 2014).

Land use policy intervention may affect the changes in the availability of land that subsequently bring changes to land accessibility. The subdivision restriction and land classification may limit land availability to the extent that a piece of land may not be available even for a road to connect to an island parcel purchased before the introduction of the restriction. Changes in the number of subdivisions and the

transaction volume reflect changes in the availability of land. Changes in the ease of land access for road purposes was observed by comparing the number of backlogged applications requesting land subdivisions at the survey offices in Kathmandu Valley. A reduction in the availability of land parcels may not allow many potential buyers to participate in the formal land market and excludes them from access to land rights.

The *Land Use Policy 2012/2015* and the *Land Use Act 2019* mandate a coordination mechanism that connects various stakeholders during the implementation of land use regulation. Road expansion implemented by the KVDA is one of the major programs in the Kathmandu Valley that caught many stakeholders' attention. The road expansion implementation process was reviewed to identify whether there was any coordination mechanism between the survey offices and the KVDA. Considering that the data pertaining to property violations resulting from poor coordination between the land use regulation agencies would help to identify the number of people affected by land use decisions, the number of private plots affected by the road expansions were identified.

4.4. Validation

Validating research findings is a complex cognitive process (Kihn and Ihantola, 2015). No single method, theory or observer can capture all relevant or important information (Fusch et al., 2018). Schou et al. (2011) developed a new assessment tool that could be used to assess the trustworthiness of qualitative research articles. They applied three phases of validation strategies: in Phase 1, they tested content validity through intensive literature review and face validity through interviews with the experts; in Phase 2, they developed the criteria for validating the assessment tool; in Phase 3, they tested the applicability of the tool by collecting the judgements of sample participants in terms of rating and score and examined the statistical tests. A similar phased approach was adopted by Noble and Heale (2019). The validity and reliability of case study research can also be tested by clarifying each crucial step, such as collection, reduction, analysis of data, and documentary evidence supporting the findings (Ekanayake, 2015).

In sequential mixed-methods research, where the results of one step are used as an input to another, the phase-wise validation of these findings improves the researcher’s

confidence in the ultimate findings. The broad-level objective of this research is to measure the impact of land use regulation on the land market in Nepal. I adopted a sequential mixed method, starting with the desktop review followed by qualitative analysis of the interview data and quantitative analysis of the survey questionnaire data. I then compared the direction of the impact with the findings from the analysis of secondary data. The phase-wise classical approach was adopted to validate our findings.

Each step in the data analysis was scrutinised to validate the successive results from different methods. The validity, consistency and reliability of intermediate outputs justify the validity, consistency and reliability of the ultimate findings. Table 4-5 summarises the validation applied for each of the findings at different stages during the research process.

Firstly, the impact factors, which were the output of the desktop review, were validated by the findings of the interviews. The content and the structure of the interviews were also validated through discussion with local experts on the Nepalese land market. The same approach was followed for the structure and the content of the survey questionnaire.

The intermediate results derived through the quantitative analysis of the survey data in AHP were checked for consistency and reliability. AHP uses a mathematical approach to test the consistency of ranking and reliability of the weights. The reliability of the weights assigned was also checked through the rank correlation between the local and composite weights.

Table 4-5: Summary of the validation steps followed in the research

Sequence	Validation requirement	Validated through	Validation strategy
Desktop review	Do pre-identified impact factors, as an output, cover what is needed for the Nepalese land market impact assessment?	Survey interview	Content validity
Interview	Contents and structure of the interview questions	Outcomes of pre-survey discussion with a local land expert	Content construct validity
Questionnaire survey	Contents and structure of the questionnaire	Outcomes of pre-survey discussion with a local land expert	Content & construct validity
AHP	Rank of alternatives	Consistency checking	Consistency
	Weight of the impact factors	Reliability testing The rank correlation between local and composite weight	Reliability Consistency
	Degree of the calculated impact	Comparing the responses received from the interview and those obtained from the questionnaire	Internal validity
Secondary data analysis	The direction of impact (Impact Result)	Archival records or documentary evidence derived for the secondary data analysis	External validity

The final impact and the direction of the impact, as calculated through the stakeholders' perspectives, was validated through the analysis of different groups of secondary data on the Nepalese land market. Results were checked for their convergence to test their credibility (trustworthiness); the requirement of external validity was achieved.

4.5. Ethical Considerations

Ethical approval was acquired through the USQ Human Research Ethics Committee before embarking on fieldwork for survey and interview data collection (Approval no. H18REA064). A pre-meeting was organised with the Survey Department executives to clarify the objectives of the research. Similar information was provided to the Ministry of Land Management, Cooperatives and Poverty Alleviation, and Nepal Rastra Bank—the federal reserve bank of Nepal. Participants were recruited after consultation with each organisation. Participation in the data collection process was voluntary. Consent was acquired before any data collection and before any recording of interviews.

Semi-structured interview questions were discussed with local land experts before they were distributed to the participants. The semi-structured interview questions were

provided to participants prior to the interview. The questionnaires were carefully designed and tested before distribution. The questionnaire was discussed with various land experts before finalisation. A cover page statement was provided to each participant to inform and assure them of the confidentiality of the data collected. The participants were also informed that only consolidated data would be used in the research publication. The survey questionnaire was distributed in person, and the data was collected directly on the analogue questionnaire sheet and digital scan was stored on the USQ Next Cloud server.

4.6. Chapter Summary

This chapter discussed the research design and methods adopted to measure the impact of the introduction of land use regulation on the land market in Nepal. It was proposed that assessing a land market in a broader context could be performed through the philosophical paradigm of subjective ontological pragmatism. It was important that the impact of land use regulation on the land market in Nepal could be assessed by holistically adopting an exploratory mixed-method research design. In the first phase of this study, interview and survey strategies were adopted to collect stakeholders' perspectives on the impact of land use regulation on the land market in Nepal. This strategy was chosen to collect perspectives based on primary qualitative data blended with the quantitative information. An archival research strategy was then used to collect documentary-based quantitative secondary data.

Primary data collected through the interviews was processed in QDA Miner software for descriptive and link analysis. Questionnaire data were processed through AHP to derive the land market impact score. Documentary-based quantitative secondary data were analysed by comparing data for the period before and after the introduction of the land use regulation. This chapter proposed a new approach that can allow to incorporate the stakeholders' perspective in measuring the impact of land use regulation on the land market through the application of data collected through Survey, and therefore partly answered the third research question. It also proposed methods to examine changes in the land market through documentary evidence and archival records. Chapter Five presents the survey results derived through the methods outlined in this chapter, while Chapter Six will present the changes in the land market based on the documentary evidence.

Chapter 5: Impact of Land Use Regulation on the Land Market in Nepal – Stakeholders' Perspective

5.1. Introduction

The previous chapter discussed the research design and methods to address the research questions and objectives of this study. This chapter will present the findings of the stakeholders' perspectives of the impact of land use regulation on the land market in Nepal.

The chapter firstly refines the impact factors and indicators of land use regulation relevant to the Nepalese land market. Building on the desktop review of impact factors in Chapter Two, 60 participants as specified in section 4.3.2.4 (Appendix 17), were interviewed to further refine the previously identified impact factors and indicators to ensure they were relevant to the Nepalese land market. The results of the interview and refinement process are presented in Section 5.2.

Next, the refined impact factors and indicators were incorporated into the questionnaire survey to understand the impact of land use regulation on the land market across a variety of land market stakeholders in Nepal. Section 5.3 provides a summary of the descriptive statistics of the survey results.

Finally, the survey outcomes were analysed using the analytic hierarchy process (AHP) to derive consolidated impact indices that would represent the impact of land use regulation on the land market in Nepal across the economic, social, environmental and institutional dimensions. The results of the AHP are described in Section 5.4. Figure 5-1 illustrates the relationship between the data collection strategy and the objectives of this chapter.

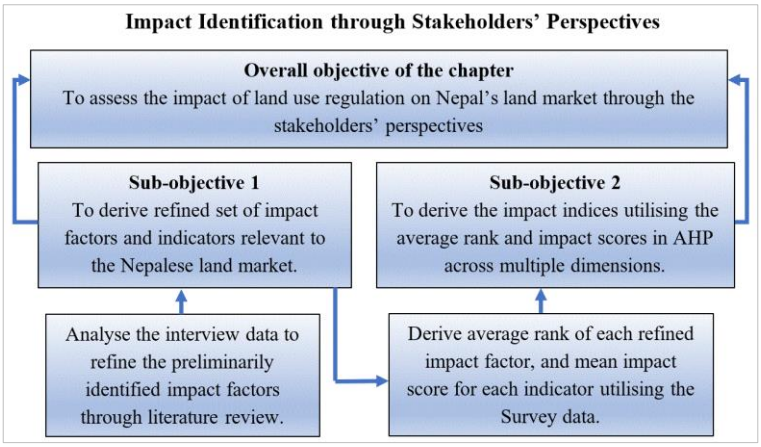


Figure 5-1: Relationships between data collection strategy and objectives

5.2. Refinement of Impact Factors and Indicators

Measuring the impact of land use regulation on the land market requires the identification of the possible impact factors relevant to the Nepalese land market. Based on the desktop review that was undertaken and described in Chapter Two, land market impact factors were identified and then further refined through interviews with various stakeholders in the Nepalese land market. This section presents the results of the interview process and the refined impact factors and indicators. Section 5.2.1 describes the interview process and responses across multiple dimensions. Section 5.2.2 presents the results of the QDA Miner software analysis which identified the key impact factors and impact issues across each dimension. Finally, Section 5.2.3 reviews both the interview-derived and literature-based impact factors to determine a refined set of impact factors along with the associated impact indicators.

5.2.1. Interview Process and Responses

A total of 60 interview participants were selected through purposive sampling across institutional, private and financial organisations, with 20 respondents per group following the methods discussed in section 4.3.2.4 (Appendix 17). The semi-structured interview included questions focused on exploring participants' perspectives on the impact of land use regulation on the land market across economic, social, environmental and institutional dimensions, to reveal land market impact factors relevant in the Nepalese context.

The interview respondent profile is shown in Figure 5-2. Interviewees from the Institutional Group included joint secretaries of government ministries (heads of

divisions), directors-general (department heads), chief survey officers (heads of the Survey Offices), planning officers of local government offices, executives of the Land Revenue Offices, and other government agencies. Interviewees from the Private Sector Group included executive members of land professional organisations, local land experts, managers of private land development organisations, surveying and engineering consultancies, and hydropower organisations. Interviewees from the Financial Group included the Director of the Federal Reserve Bank (Nepal Rastra Bank) and executives of banks and financial institutions. The interviewees provided a good cross-section and representation across land market stakeholders in Nepal.

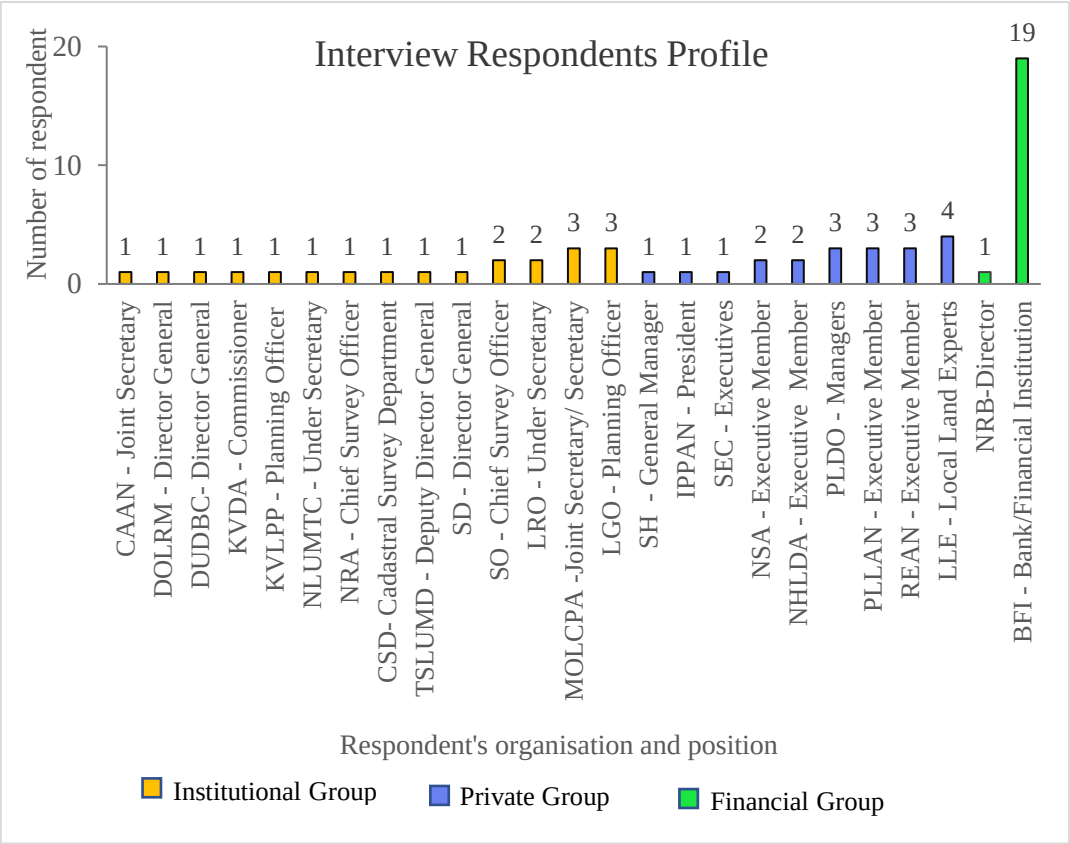


Figure 5-2: Interview respondents by group, organisation, and their role

The interview sought to explore the perspectives of stakeholders regarding the impact across the economic, social, environmental and institutional dimensions on the land market resulting from the introduction of land use regulation in Nepal. A total of 14 questions were asked to identify the impact factors and issues associated with land use regulation that have affected the land market (Appendix 2).

The interviewer opened with a question (Q1) asking stakeholders about the broader impact of land use regulation they had experienced. Four questions (Q2, Q3, Q4 and Q5) explored the impact factors and indicators associated with the changes in taxation, the cost of land transactions, the availability of mortgages, and compensation relating to the introduction of land use regulation in Nepal.

Three questions (Q6, Q7 and Q8) explored the impact factors across the social dimension, including whether the implementation of land use regulation had addressed the social expectations and the social impact caused by the resettlement program. Two questions (Q9 and Q10) explored the impact factors and associated impact issues across the environmental dimension. A further two questions (Q11 and Q12) investigated the existing implementation arrangements and how those arrangements impacted the land market through institutional perspectives. Finally, the last two questions (Q13 and Q14) were intended to summarise the participant's view of the overall impact of land use regulation on the land market.

5.2.2. Identification of Impact Factors across Each Dimension

The transcribed interview data was coded based on the themes that emerged in relation to the impact on the land market across a particular dimension. A link analysis of these codes was performed in QDA Miner software by adopting the process discussed in the section 4.3.3.2. The link analysis produced the cluster of codes with the connection or linkage to other codes. The clusters of the codes that had a closer relationship in terms of themes were put together and visualised assigning different colours. A frequency analysis of the codes was performed, and the size of each node in each cluster was set in proportion to the frequency of the coded responses. The results of the QDA Miner analysis are detailed below across the economic, social, environmental and institutional dimensions.

5.2.2.1. Economic Dimension

The analysis performed in the QDA Miner software showed interrelated clusters of responses across the economic dimension (Figure 5-3). These clusters were found to be related to changes in the land price or value, transaction cost, taxation, mortgage availability and compensation against the loss caused by the implementation of land use regulation.

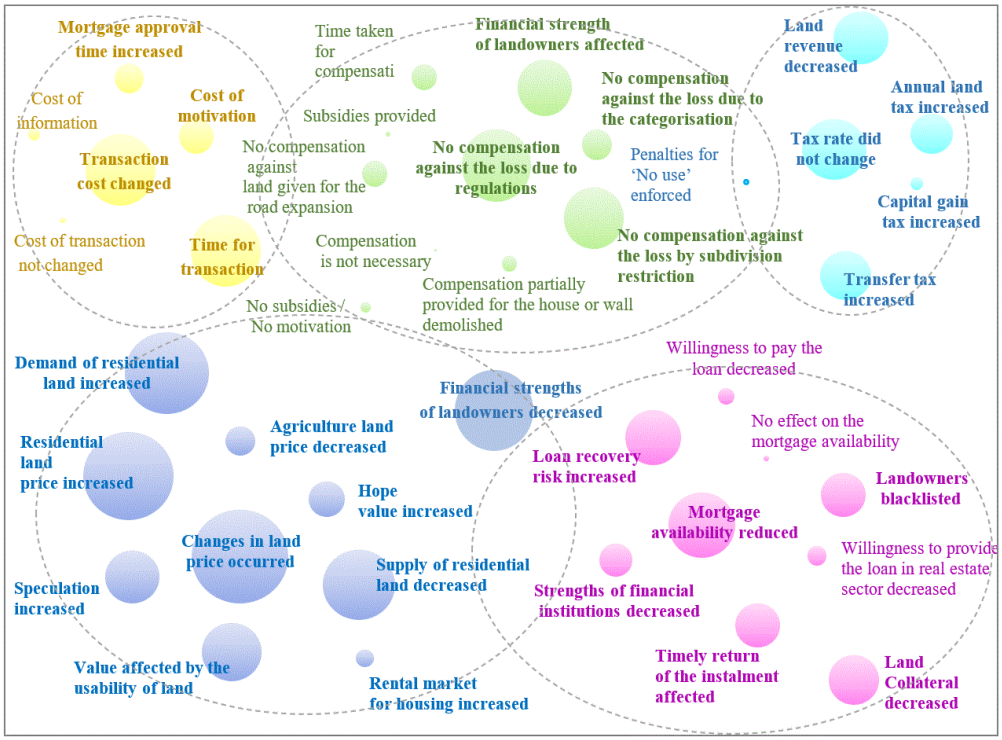


Figure 5-3: Segregated clusters of responses across the economic dimension

Respondents indicated that there were changes in land prices or values after the introduction of land use restrictions, particularly as a result of land reclassification and subdivision control. Most of the responses (68%) indicated that prices of residential land had increased and 23% indicated a reduction in the price of agricultural land in the Kathmandu Valley due to the reduced supply of land caused by land use restrictions. The enforcement of the land use classification changed the ability to use the land for its previous purpose and therefore affected the land value. The reduction in supply increased demand; in turn, the value of the land increased due to speculation in the land market. The increase in the price of residential land in the Kathmandu Valley also resulted in higher demand in the rental housing market.

The subdivision restrictions did not allow landowners to sell their developed land, considering that the land was originally classified as agricultural land. The financial strength of landowners who were developing the land as part of a business was impacted in that they could not make loan repayments to their financial institutions and were consequently blacklisted. For banks, the number of non-performing loans or defaults increased, and so financial institutions identified that there was a higher risk

in providing loans for real estate development. Therefore, the land market experienced a reduction in the mortgage availability due to these increased risks.

Affected landowners also could not receive compensation for the financial loss incurred by their inability to sell their land following the land reclassification. Landowners expected support such as subsidies for agricultural production, but this was not available. There was no compensation provided for private land acquired by the Kathmandu Valley Development Authority (KVDA) for road expansion. Only a few landowners received compensation for the collapse of their buildings due to road construction, and this payment took a considerable amount of time. The lack of compensation impacted the finances of landowners, who had expected some form of compensation for the impacts of the implementation of land use regulation.

Some landowners also incurred penalties for not using their land, which was an additional financial burden on them. The government experienced a reduction in the revenue collected from land transactions despite increases in the transfer tax and capital gains tax.

The implementation of land use regulation also resulted in changes to the cost of land transactions, with additional time spent on field verification to confirm road boundaries and land use categories. Following the introduction of land use regulation, landowners were reluctant to confirm their land use category and were required to pay for land information. Respondents indicated that the land use regulation caused them to spend more in the transaction process as they were often required to pay a higher fee than earlier. Banks and financial institutions also experienced longer transaction times for their applications to be processed in the Land Revenue Offices. Overall, most of the responses indicated changes in transaction costs due to land use regulation.

The coded text in each identified cluster was then interpreted to group them into impact issues indicative of the impact of land use regulation. These impact issues were then further analysed to identify the key message in the context of the overall objective of research. Table 5-1 summaries the third stage data reduction process from initial coded information to the key messages.

Table 5-1: Interpretation of codes and data reduction across economic dimension

Codes in clusters (first stage reduction of raw data)	**Impact issues derived from codes (Second stage reduction)**	**Key message from the interview (Third stage reduction)**
• Transaction cost changed • Time for transaction increased • Cost required for the verification of land use information • Cost of motivation required • Mortgage approval time increased • Cost of transaction did not change	• Transaction fees changed, • Time taken for transaction changed	Changes in the **transaction cost** occurred
• No compensation against the loss due to land use regulations • No compensation against the loss due to categorisation • No compensation against the loss by subdivision restrictions • No compensation against the land given for the road • Compensation partially provided for the house or wall demolished • Financial strength of landowners affected • Time taken for compensation distribution long • No Subsidies / No motivation • Subsidies provided • Compensation is not necessary	• Compensation paid for loss due to subdivision restriction was not sufficient • Compensation for loss due to road expansion was not sufficient • There was a delay in the payment of compensation • The subsidy was not sufficient.	There was inadequate **compensation** to landowners for loss due to land use regulation
• Land revenue decreased • Transfer tax increased • Annual land tax increased • Tax rate did not change • Capital gain tax increased • Penalties for 'no-use' enforced	• Change in the land tax • Penalties against misuse or no use of land.	Changes in **taxation** occurred
• Residential land price increased • Agricultural land price decreased • Demand of residential land increased • Supply of residential land decreased • Value affected by the usability of land • Changes in land price occurred • Hope value increased • Speculation increased • Rental market for housing increased • Financial strength of landowners affected	• Changes in the price of residential land occurred • Changes in the price of agricultural land occurred. • demand of land increased, and supply of land decreased implied that changes in price occurred • Rise in price speculation occurred	Changes in the land price or **valuation** occurred differently across new land classifications
• Loan recovery risk increased • Strength of financial institutions decreased • Willingness to provide the real estate loan decreased • Land collateral decreased • Instalment payment delayed • Willingness to pay the real estate loan decreased • Financial strength of landowners decreased • Landowners blacklisted • Mortgage availability reduced • No effect on mortgage availability	• Accessibility to loan using the land property as collateral • Number of landowners who received the loan from financial institutions decreased • Number of blacklisted landowners/Capability of landowners to repay the loan decreased. • Changes in the financial strength of the financial institutions/Non-performing loan increased	**Mortgage availability** reduced by land use regulation

5.2.2.2. Social Dimension

The interview responses suggested that the implementation of land use regulation caused a range of social impacts on stakeholders. The link analysis indicated three significant clusters of responses across the social dimension: awareness of land use regulation, particularly subdivision restriction and land classification; failure to meet social expectations; distance to the workplace (Figure 5-4).

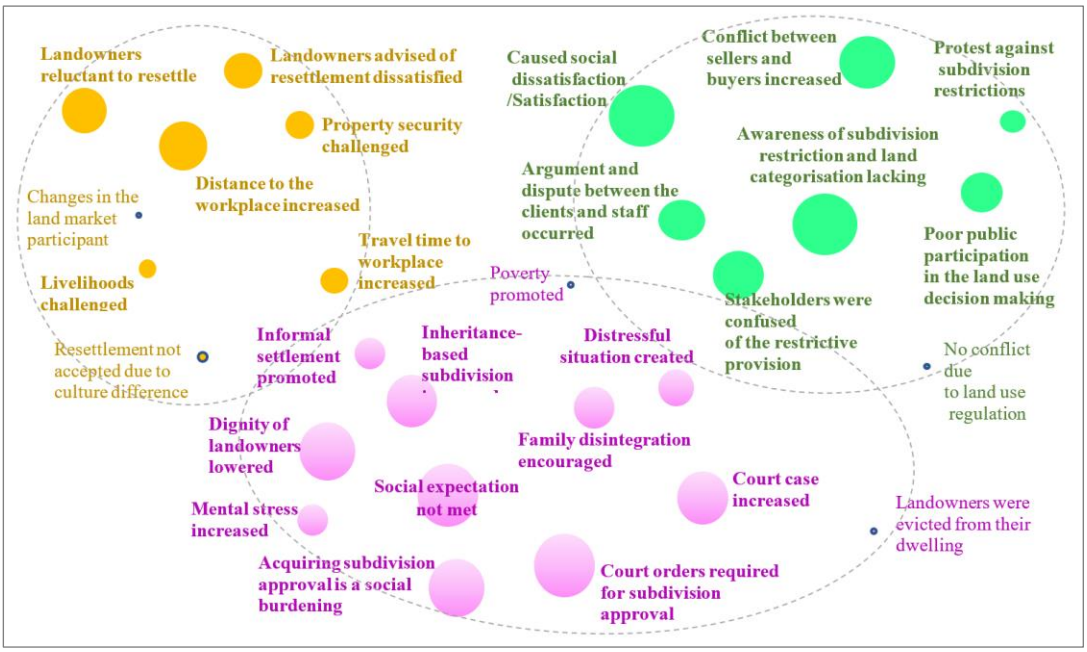


Figure 5-4: Cluster of responses regarding the outcome across the social dimension

Respondents indicated that there was limited communication with and participation by stakeholders in the policy formulation and implementation process. Landowners were unaware of the subdivision restriction and were confused about the new land classification system which was different to what was specified in the land use policy.

Because of this lack of awareness, landowners continued to engage in the usual land market practices such as making advanced payments for residential land despite the new subdivision restrictions. When the land transaction could not occur, arguments would ensue between clients and the staff of the Land Revenue and Survey Offices. The buyer would request the return of the deposit from the landowners and brokers. If the money was not returned, conflicts between the landowners, brokers and buyers then led to court cases.

Another social factor causing dissatisfaction to stakeholders was that the new restrictions did not allow land subdivision. To overcome this restriction, some landowners initiated a family split, which allowed the subdivision approval through court proceedings. This meant that court cases related to subdivisions associated with divorces increased and the steps taken by these landowners were indicative of the level of dysfunctional behaviour within families caused by the new regulations.

Similarly, the implementation of road widening resulted in the forced eviction of landowners, which increased their stress levels, impacted their financial situation and stripped them of dignity when their land was acquired by force, or they were blacklisted by their bank or financial institution.

A small number of respondents identified social issues with a resettlement scheme implemented by the government to shift landowners and their families away from areas prone to landslides or flooding. The identified resettlement areas were often a significant distance from residents' existing dwellings, which affected the distance and time taken to travel to their farmland or workplace. Some respondents also indicated that landowners felt at risk of losing their property if they were resettled at a distant location; they were therefore reluctant to be resettled despite the risk of landslides or floods. The overall impact was that the resettlement program caused social dissatisfaction of landowners based on these proximity issues. Table 5-2 summarises the the three-stage data reduction process from initial coded information to the identification of key messages.

Table 5-2: Interpretation of codes and data reduction across social dimension

Codes in clusters (first stage reduction of raw data)	**Impact issues derived from codes (Second stage reduction)**	**Key message from the interview (Third stage reduction)**
• Stakeholders were confused about the restrictive provisions • Conflict between sellers and buyers increased • Poor public participation in the land use decision making • Protest against subdivision restrictions • Argument and dispute between the client and staff occurred • Caused social dissatisfaction/Satisfaction • No conflicts due to land use regulation • Awareness of subdivision restrictions and land categorisation lacking	• Conflict between sellers and buyers due to lack of awareness of land use regulation • Dispute between clients and staff over the failure of parcel subdivision	Low level of **awareness** of the land use regulation created conflict between the stakeholders
• Court orders required for subdivision approval • The dignity of landowners lowered • Acquiring subdivision approval is a social burdening • Court cases increased • Inheritance-based subdivision increased • Family disintegration encouraged • Distressful situation created • Informal settlement promoted • Mental stress to the landowners increased • Poverty promoted • Landowners were evicted from their dwellings • Social expectation not met	• Ease of the subdivision approval process decreased due to the requirement of court orders and inheritance-based fragmentation • Number of court orders increased for acquiring subdivision approval	**Social expectation** not met as revealed by increased court cases for subdivision approval
• Distance to the workplace increased • Travel time to the workplace increased • Livelihoods challenged • Resettlement not accepted due to cultural differences Landowners advised of resettlement dissatisfied • Property security challenged • Landowners reluctant to resettle • Changes in the land market participant occurred	• Satisfaction of landowners due to distance to the workplace/Dwellings. • Satisfaction of landowners due to travel time to the workplace. • Changes in number of landowners/buyers in the existing local land market	Landowners were dissatisfied with the allocation of resettlement or lack of **proximity.**

5.2.2.3. Environmental Dimension

Three clusters of recurrent responses were identified across the environmental dimension related to risk reduction, quality of residential land in planned areas, and haphazard or unplanned land use (Figure 5-5). The quality of residential land differed significantly between planned and unplanned areas, with planned subdivisions having improved amenity, including wider urban roads and a utility service network, maintained green space, additional open space, reduced pollution and lower fire risk. The increase in the environmental value also increased the market value due to a higher demand for these quality residential areas. However, the supply of such quality

residential properties is not sufficient, despite their positive contribution to the environment.

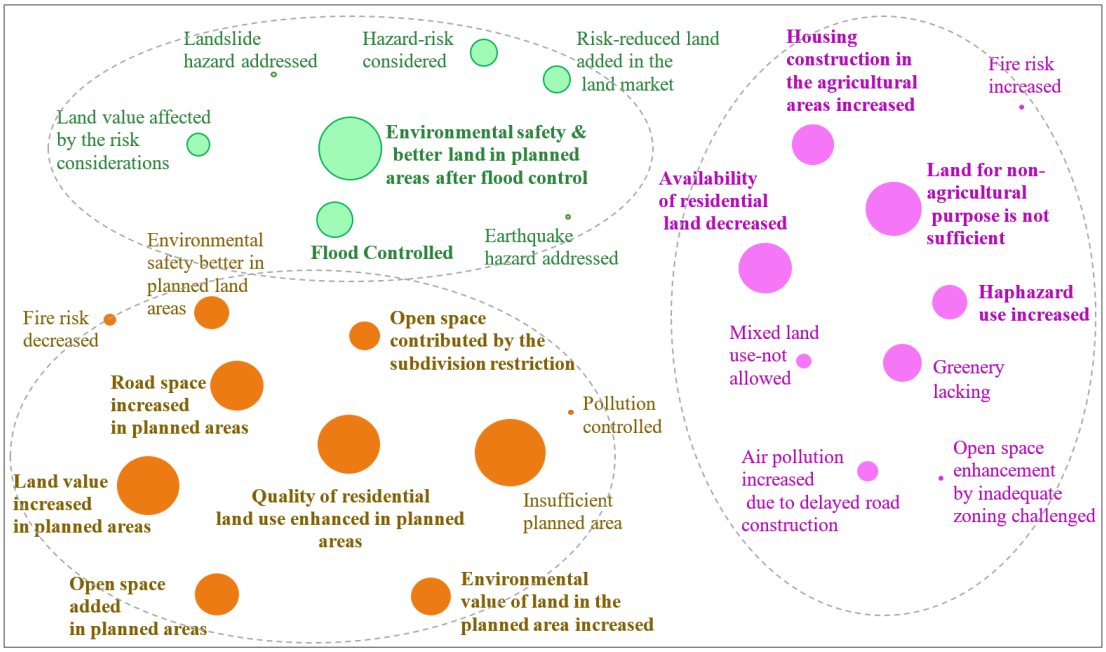


Figure 5-5: Cluster of responses as to the outcome across the environmental dimension

Due to land regulation, land available for residential use decreased and residential land supplied by the land pooling projects was not sufficient to meet the demand. This demand resulted in an increase in unplanned or haphazard use of agricultural land for housing purposes in the Kathmandu Valley. The motivation behind the subdivision restriction was to maintain open space; however, this was challenged by the number of housing construction approvals granted by municipalities to cope with housing shortages. Table 5-3 summarises the three-stage data reduction process from initial coded information to the identification of key messages.

Table 5-3: Interpretation of codes and data reduction across Environmental dimension

Codes in clusters (reduction of raw data)	Impact issues derived from codes	Key message from the interview (theme derived)
• Insufficient planned area • Road space increased in planned areas • Open space added in planned areas • Open space contributed by the subdivision restriction • Quality of residential land use enhanced in planned areas • Pollution controlled • Fire risk decreased • Environmental safety better in planned land areas • Environmental value of land in the planned area increased • Land value increased in planned areas	• Change in the supply of residential land with added enhanced road and utility infrastructure • Change in the supply of quality residential land with added open land pooling areas. • Change in the land value of quality residential plots compared to surrounding unplanned areas	Changes in the **quality of residential land** affected the land market by changing the value and supply of quality land.
• Land for non-agricultural purposes is not sufficient • Availability of residential land decreased • Housing construction in the agricultural areas increased • Haphazard use of land increased • Greenery lacking • Mixed land use-not allowed • Fire risk increased • Open space enhancement by inadequate zoning challenged • Air pollution increased due to delayed road construction	• Sufficiency of land allocated for non-agricultural purposes. • Changes in the haphazard housing construction in agricultural land in Kathmandu Valley	Inadequate classification or **Suitability of Zoning Classification** did not address the land requirement and promoted haphazard use
• Environmental safety and better land in planned areas after the flood control • Flood controlled • Hazard-risk considered • Risk-reduced land added to the land market • Land value affected by the risk considerations • Landslide hazard addressed • Earthquake hazard addressed	• Changes in the flood-risk area in the Kathmandu Valley • Changes in the supply of road hazard-safe plots in the Kathmandu Valley	**Risk reduction** changed supply and value in the land market

5.2.2.4. Institutional Dimension

Respondents raised concerns in their responses across the institutional dimension about the property rights associated with the land (Figure 5-6). Most of the responses focused on three factors associated with the impact of land use regulation on the land market in Nepal: subdivision restriction, lot size control, and the absence of coordination mechanisms.

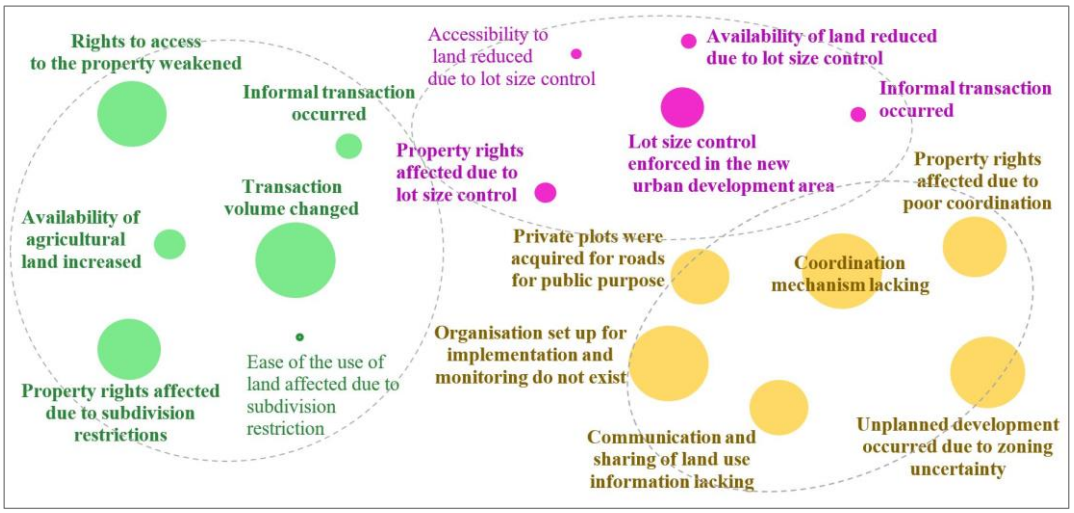


Figure 5-6: Cluster of responses regarding outcomes across the institutional dimension

Regarding lot size control, it was found that availability of qualifying lots in the urban land market was limited. The lot size standard restricted the subdivision of land smaller than a specified area, thereby reducing supply. The purchase of larger land parcels was not affordable for most of buyers. The lot size control was seen as an impingement on land rights by both potential buyers and existing landowners, who were deprived of the opportunity of selling their properties. Lot size control triggered informal transactions in the land market which created further risks to property rights.

The reduction in the availability of land increased land cost and therefore reduced access to the land for the poor. Landowners who intended to buy a small piece of land adjoining their lot to increase their total land area or improve access also could not buy extra land.

According to the respondents, a robust coordination mechanism was lacking for the effective implementation of land use regulation. At the time this research was conducted, there was no organisation established for the effective implementation and monitoring of land use planning in Nepal. Some respondents mentioned that communication and sharing of land use information between the implementation agencies was lacking. This lack of coordination resulted in conflicting and overlapping land use plans devised by various organisations. The lack of coordination and communication also impacted on planning decisions and standards and had resulted in an increase of unplanned land development within and around the Kathmandu Valley. Table 5-4 summarises the impact issues explored across the institutional dimension.

Table 5-4:Interpretation of codes and data reduction across Institutional dimension

Codes in clusters (first stage reduction of raw data)	Impact issues derived from codes (Second stage reduction)	Key message from the interview (Third stage reduction)
• Private plots were acquired for roads for the public purpose • Organisation set up for implementation and monitoring does not exist • Coordination mechanism lacking • Communication and sharing of land use information lacking • Property rights affected due to poor coordination • Unplanned development occurred due to zoning uncertainty	• Change in the quantity (or number) of private lots affected by the road expansion • Number of court cases registered against the KVDA to secure property rights caused by poor coordination • Change in the Zoning Certainty	• Poor **coordination** mechanism affected property rights
• Transaction volume changed • Ease of the use of land affected due to subdivision restriction • Informal transaction promoted • Availability of agricultural land increased • Property rights affected due to subdivision restrictions • Rights to access to the property weakened	• Decrease in the number of land parcels subdivided • Changes in the accessibility to the adjoining parcel to use for road purposes. • Increase in the number of informal transactions	• **Subdivision restriction**s affected the availability of land and accessibility to land rights
• Lot size control enforced in the new urban development area • Availability of land reduced due to lot size control • Accessibility to land reduced due to lot size control • Informal transaction occurred due to lot size control • Property rights affected due to lot size control	• Changes in the number of availabilities of available qualifying the transaction • Changes in the number of land transactions involving parcels bigger than the enforced threshold size • Changes in the accessibility to land rights	• **Lot size** affected the availability of land and access to land rights

5.2.3. Refinement of Impact Factors

Section 2.3 of this thesis explored land market impact factors across the literature. The interview also provided several factors associated with the impact of land use regulation on the land market. The impact factors identified through the literature and those recurring in the interview data from this study were reviewed for their similarity. To arrive at a standard set of impact factors, those which were similar or repeated were reclassified and allocated to economic, environmental, social and institutional dimensions based on their relevance to the Nepalese land market (Table 5-5).

There was good overall agreement on the categorisation of the impact factors across the four dimensions except for two impact factors across the social dimension:

‘willingness’ and ‘acceptance’. A new factor, ‘awareness’, was included in the refined list. The reason for the removal of ‘willingness’ and ‘acceptance’ from the list of preliminarily identified impact factors was that these elements were considered pre-requisite social elements for the implementation of land use planning and therefore were not to be included in the list. Instead, the success of land use planning and its impact on a land market depends on the level of awareness of stakeholders and the degree of social expectation met by the regulation. Similarly, among the four preliminary identified impact factors through literature review across institutional dimension (see Figure 2-9), the issue of property rights was found as an effect of lot size control, subdivision restrictions and coordination, and therefore it was treated as an indicator rather than impact factor by itself.

Table 5-5: Impact issues identified from the desktop review and interview

Dimension	Preliminary impact factors from literature review	Key theme from interview	Refined Impact Factor	Impact indicators relevant to the Nepalese land market based on the interview responses
Economic	**Transaction cost**	Changes in the transaction cost occurred	**Transaction cost**	Changes in the cost of transaction
				Changes in the time of transaction
	Valuation	Changes in land value or price occurred differently	**Valuation**	Changes in the price of residential land
				Changes in the price of agricultural land
				Price speculation due to land categorisation or subdivision restriction
	Mortgage availability	Mortgage availability reduced by the land use regulation	**Mortgage availability**	Accessibility of land property as collateral
				Number of blacklisted landowners
				Changes in the financial strength of the financial institutions
				Number of landowners who received loans from financial institutions
	Taxation	Changes in taxation occurred	**Taxation**	Changes in land tax
				Penalties for no use of the land
	Compensation	There was inadequate compensation to landowners for the loss due to land use regulation	**Compensation**	Sufficiency of the compensation paid for loss due to subdivision restriction
				Sufficiency of compensation for loss due to road expansion
				Time required for the payment of compensation
Social	**Willingness & Acceptance**	Low level of awareness of land use regulation created conflict between stakeholders	**Awareness**	Conflict between sellers and buyers due to lack of awareness of land use regulation
				Dispute between clients and staff over the failure of parcel subdivision
	Expectation	Social expectation not met as revealed by the court cases for subdivision approval	**Expectation**	Ease of the subdivision approval process
				Number of court order cases for subdivision approval
	Proximity	Landowners dissatisfied with the allocation of resettlement	**Proximity**	Satisfaction of landowners due to distance to the workplace
				Satisfaction of landowners due to travel time to the workplace
				Changes in the number of landowners/buyers in the land market
Environmental	**Risk reduction**	Risk considerations in land use planning changed supply and value in the land market	**Risk reduction**	Changes in the area at risk of flooding in the Kathmandu Valley
				Changes in the supply of flood-safe plots in the Kathmandu Valley
	Quality of residential land	Changes in the quality of residential land made a difference in the land market by changing the value and supply of such land	**Quality of residential land**	Supply of residential land with added open space in land pooling areas
				Change in the supply of residential land with added enhanced road and utility infrastructure
				Change in the land value of quality residential plots compared to surrounding unplanned areas
	Suitability of zoning classification	Inadequate classification did not address the land requirement and promoted haphazard use	**Suitability of zoning classification**	Sufficiency of land allocated for non-agricultural purpose
				Changes in the amount of housing construction in agricultural land of the Kathmandu Valley

Dimension	Preliminary impact factors from literature review	Key theme from interview	Refined Impact Factor	Impact indicators relevant to the Nepalese land market based on the interview responses
Institutional	**Lot size**	Lot size affected the availability of land and accessibility to land rights	**Lot size**	Number of available parcels qualified for the market transaction
				Changes in the number of transactions of parcels bigger than the threshold size
				Changes in the accessibility to land rights
	Subdivision restrictions	Subdivision restriction affected the availability of land and accessibility to land rights	**Subdivision restrictions**	Changes in the amount (count) of parcels subdivided
				Access to the adjoining parcel to use for road purpose (ease of the use of land)
				Number of informal transactions
	Coordination	Poor coordination mechanism affected property rights	**Coordination**	Number of private lots taken partly by the road expansion
				Number of court cases registered against the KVDA to secure property rights

5.3. Descriptive Statistics from Questionnaire Survey

5.3.1. Survey Data Collection Process and Responses

The objective of the questionnaire survey was to collect the stakeholder's perspectives on the impact of land use regulation. A total of 180 participants were selected through purposive sampling across institutional, private and financial organisations, with 60 respondents per group. The Survey included questions focused on exploring participants' perspectives on the changes in the land market due to the implementation of land use regulation across the economic, social, environmental and institutional dimensions.

The survey respondent profile is shown in Figure 5-7. The survey provided a good cross-section and representation across land market stakeholders in Nepal.

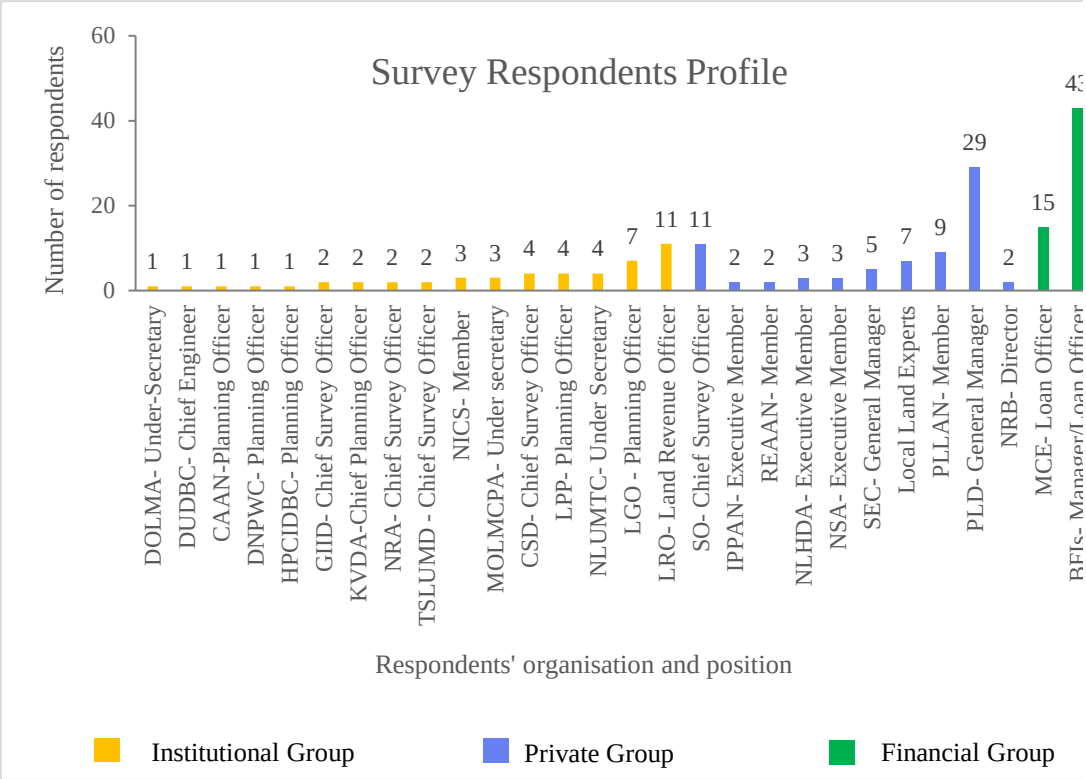


Figure 5-7: Respondents by group, organisation, and their role

The quality of the data collected from the survey depends on the level of awareness of the respondents. I therefore asked a few questions to identify whether the respondents participating in the survey were aware of the ongoing situation in the land market. The results are presented in the section 5.3.2 below. The descriptive statistics regarding the perceived impacts are discussed in section 5.3.3.

5.3.2. General Awareness of Land Use Regulation

Section A of the questionnaire document asked the respondents seven questions on their awareness of the ongoing implementation of land use regulation (Appendix 4), in particular the introduction of land use policy, enforcement of land use regulation and restrictions. They were also asked to select activities related to the implementation of land use regulation from the given list and whether these implementations had caused changes in the land price.

All respondents (100%) answered that they were aware of the introduction of land use policy in 2012 and enforcement of land use restrictions in the country. Participants responded that the implemented land use activities and restrictions impacted the land

market in Nepal. Figure 5-8 shows the frequency of participants indicating the activities related to land use regulation in Nepal. The results show that the questionnaire participants were aware of the introduction of land use regulation in the country.

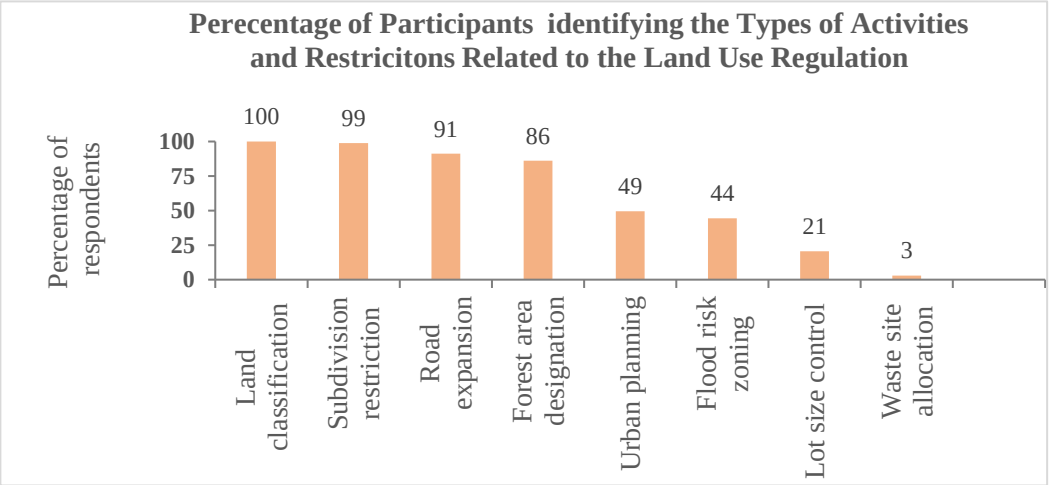


Figure 5-8: Percentage of respondents indicating various land use activities in Nepal

Respondents also indicated their concerns about the clarity of zoning and impact of land use regulation on the land market (Figure 5-9). Most of survey respondents strongly disagreed that there was clarity in zoning classification (51%) and 36% in disagreement with the same. Most of the respondents (54%) strongly agreed and 36% agreed that the land use regulation had impact on the land market.

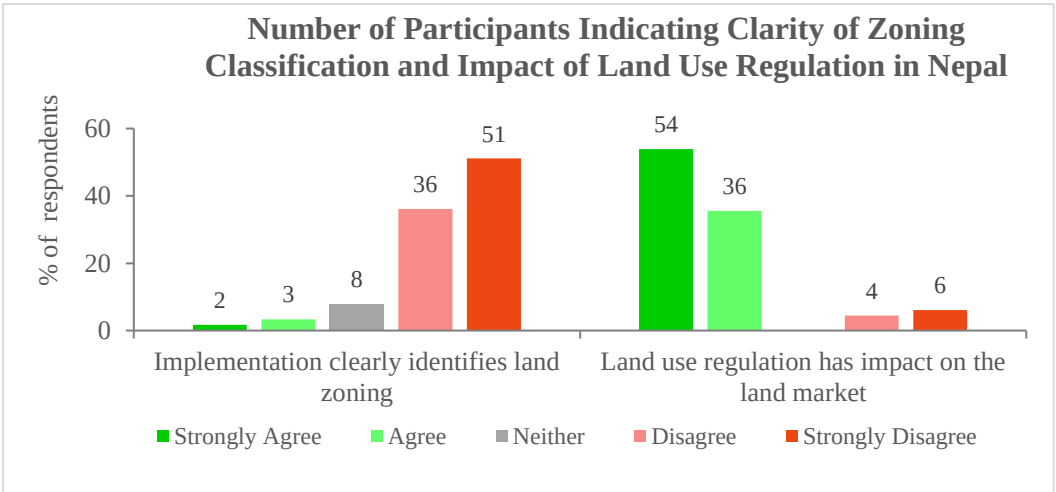


Figure 5-9: Responses on the clarity of zoning, and impact on the land market

Respondents also indicated that the implemented land use activities and the enforced restrictions had caused changes inland prices across Kathmandu Valley (Figure 5-10). There was strong agreement that the enforced land use regulation caused changes in the land price (36% respondents), and agreement of 23% of respondents on the same. The total agreement on what had caused changes in land prices in Kathmandu Valley, it was found that 96% of respondents answered that it was urban planning and development, while 89% indicated that it was road expansion, 81% indicated it was the subdivision restrictions, and 21% of respondents indicated it was lot size control. The majority of the respondents did not agree that the waste site disposal, national park and forest area designations had caused changes in land prices in the Kathmandu Valley.

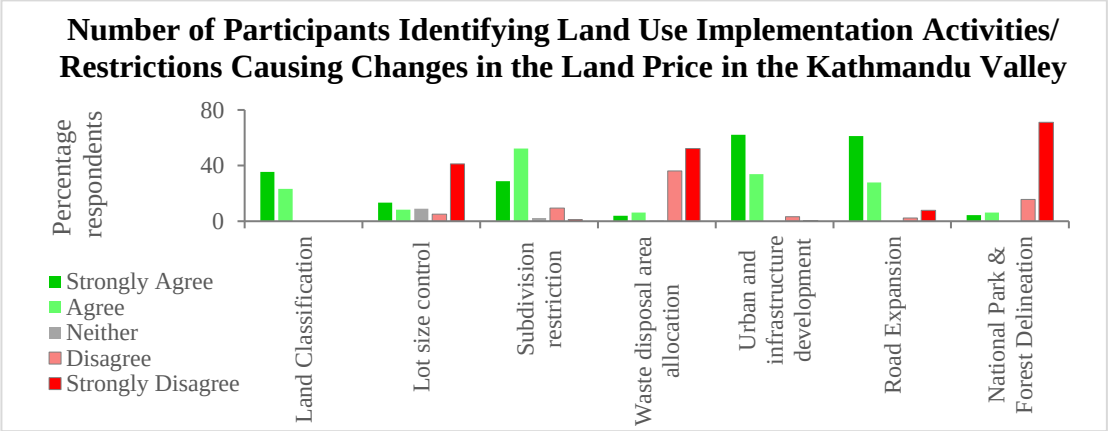


Figure 5-10: Land use activities and restrictions causing chages in land price

5.3.3. Perceived Impacts of Land Use Regulation

Data reflecting the changes that had occurred in the land market as an impact of land use regulation were collected in terms of the impact score through the questionnaire

Table 5-6: Rating Scale for scoring the impact or relative changes in the land market

Interpretation	Extremely positive	Quite positive	Slightly positive	Neither	Slightly negative	Quite negative	Extremely negative
Impact Score	+3	+2	+1	0	−1	−2	−3
% Scale	100	66.6	33.3	No impact	−33.3	−66.6	−100

(Appendix 4- Section B). To assess the relative changes in the land market, the respondents were asked to provide their rating as an impact score within the range of

+3 to −3 for each of the indicators associated with an impact factor across each dimension (Table 5-6).

Survey participants responded that the land use regulation had caused changes in the land market across multiple dimensions. The descriptive statistics of perceived impact across the economic, social, environmental and institutional dimensions are presented here.

5.3.4. Economic Dimension

Across the economic dimension, 64% of the participants responded that there had been an overall increase in the price of residential land, which they identified as the negative impact of subdivision restrictions in the Kathmandu Valley (Figure 5-11). Similarly, speculation due to a low supply of land following the restriction further caused the land price to increase, according to 88% of the survey respondents.

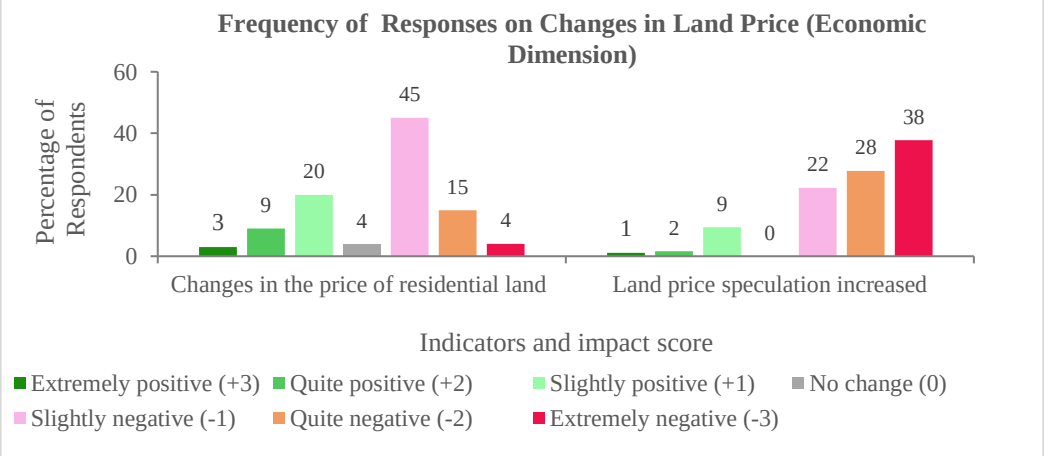


Figure 5-11: Responses on the changes in land price and impact perspectives

Similarly, overall, 90% of the respondents replied that that there was an increase in the transaction time and 77% reported an increase in the cost of transaction. The overall impression of these response indicated there was negative impact on the land market in terms of increased transaction time after the introduction of land use regulation (Figure 5-12).

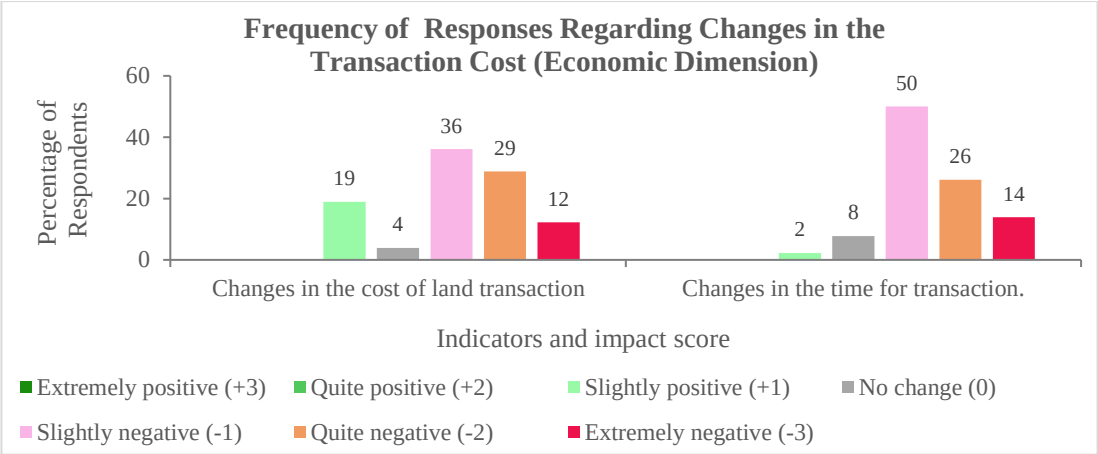


Figure 5-12: Responses about the changes in taxation and impact perspectives

The survey also indicated changes in the mortgage availability in the land market (Figure 5-13). Ninety per cent of the respondents indicated that there was decrease in the numbers of landowners receiving a loan and 82% responded that the financial strength of landowners who received the loan for real estate and residential housing had decreased as they failed to sell their land because of subdivision restrictions.

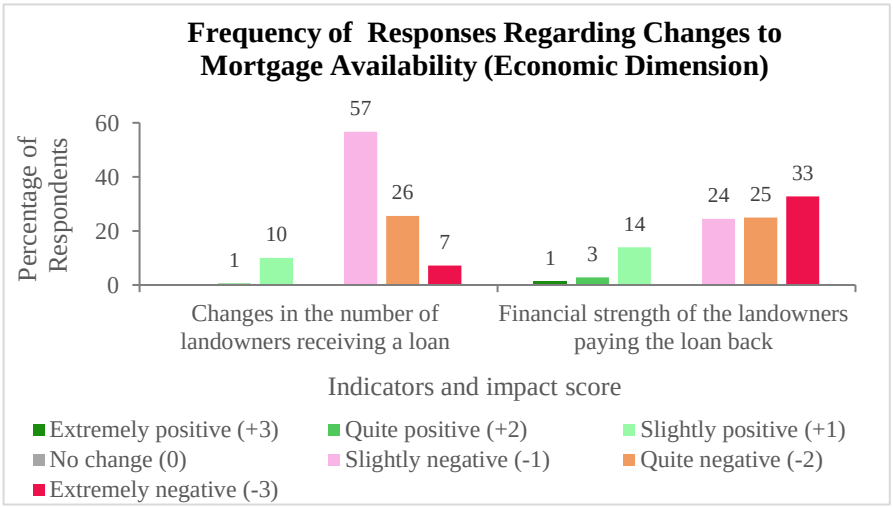


Figure 5-13: Responses about the changes on the mortgage availability

Similarly, there were responses about the changes in the transfer tax and the payment of compensation for the loss of land acquired by KVDA for road expansion. Fifty-two per cent of respondents perceived an increase in the transfer tax as a negative impact and 40% reported no change in the transfer tax. As to the compensation payment, 76% of the survey participant responded that the compensation was not sufficient. Also, the

payment of compensation took a long time to be provided, according to 66% of the survey respondents.

5.3.5. Social Dimension

The respondents identified that the land use regulation created an overall negative impact across the social dimension (Figure 5-14). 77% of the participants identified the land use regulation created conflict between buyers and sellers due to the lack of awareness of land use regulation. 85% of the respondents responded that the acquiring the subdivision approval became difficult. Overall, 71% of the responded that the subdivision-based land transaction was associated with domestic conflict and family inheritance.

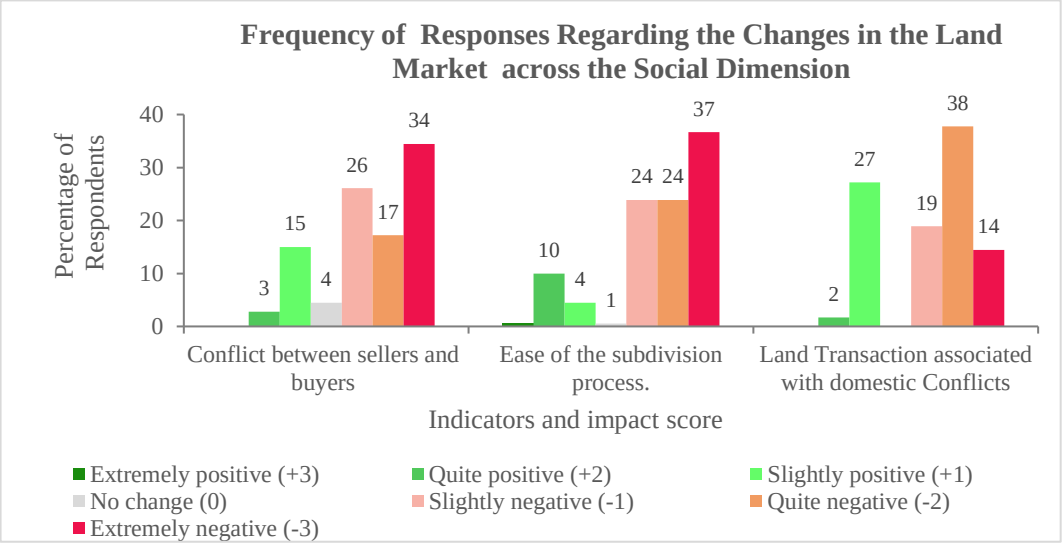


Figure 5-14: Stakeholders' perspective of impact across the social dimension

5.3.6. Environmental Dimension

Responses across the environmental dimension were found to be more positive due to the execution of flood control works in the Kathmandu Valley and the supply of land through the government-based land pooling projects and privately run land development projects (Figure 5-15). However, overall, 78% of survey participants responded that flood-control work protected land along the Bagmati, Dhobi Khola and Bishnumati (River network shown in Chapter Three) and brought positive impact by supplying risk-reduced plots on the land market.

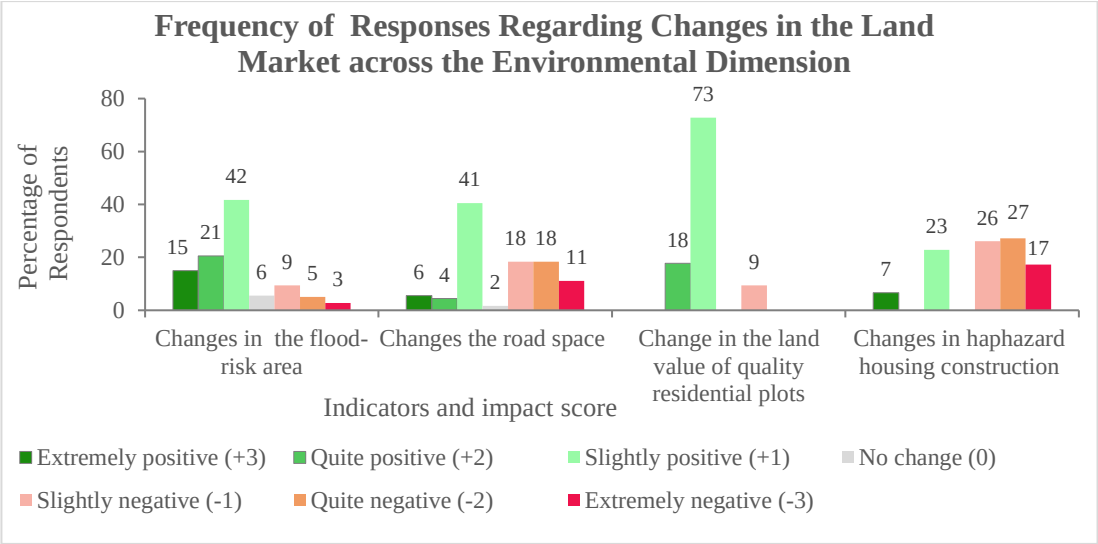


Figure 5-15: Stakeholders' perspective of impact across the environmental dimension

The responses regarding the road expansion were mixed. While increasing the road space improved traffic mobility compared to before the expansion, it also increased air pollution (dust) due to delay in the road completion. Landowners, demanding the compensation against the land taken up for the road, protested the road construction. The positive and negative environmental impact responses as to the road expansion were provided 51% and 48% of the respondents, respectively. The negative impact across the environmental dimension was also associated with haphazard housing construction due to the subdivision restriction, as indicated in the response of 70% of the survey participants.

5.3.7. Institutional Dimension

Across the institutional dimension, 82% of the survey participants responded that there were property right violations associated with the road expansion (Figure 5-16). The landowners were unknown of the road expansion plan produced by KVDA that overlapped with privately owned land which was partly acquired without sufficient compensation. 71% of the respondents indicated that the subdivision restrictions reduced the transaction volume that reduced easy access to land due to low supply and perceived as a negative impact on the land market.

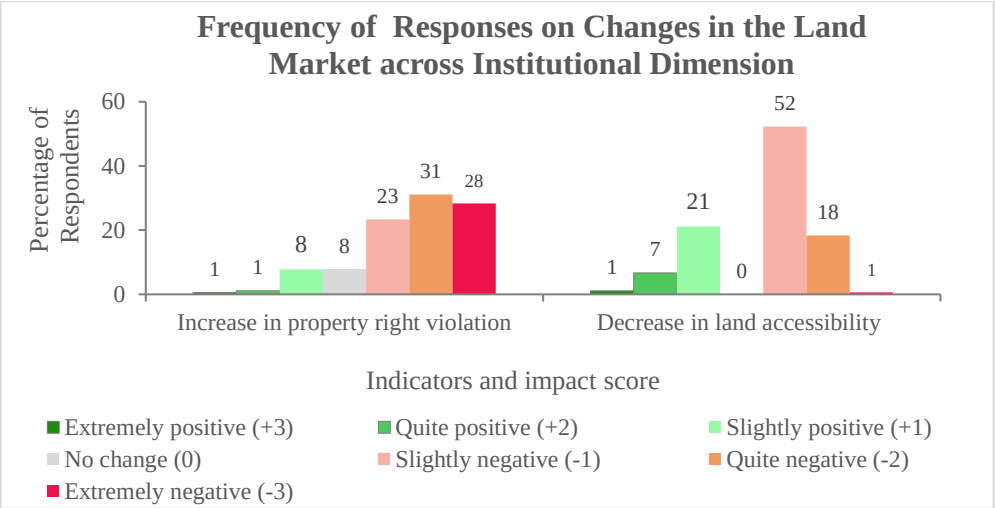


Figure 5-16: Stakeholders' perspective of impact across institutional dimension

Identifying that the respondents were aware of the implemented land use regulation, data analysis was progressed towards determining the relative changes on the land market using the impact score provided by them (Questionnaire Section B, Appendix 4). The scores are presented in the next section.

5.3.8. Scoring of Relative Changes in the Land Market

Data reflecting the impact of land use regulation on the land market were collected in terms of the impact score through the questionnaire. To assess the relative changes in the land market, the respondents were asked to provide their rating as an impact score within the range of +3 to −3 for each of the indicators associated with an impact factor across each dimension (Table 5-7).

Table 5-7: Rating of the impact score for the relative changes in the land market

Interpretation	Extremely positive	Quite positive	Slightly positive	Neither	Slightly negative	Quite negative	Extremely negative
Impact Score	+3	+2	+1	0	−1	−2	−3
% Scale	100	66.6	33.3	No impact	−33.3	−66.6	−100

The relative changes in the land market associated with each impact factor are shown in Table 5-8.

Table 5-8: Changes occurred in the land market identified through the survey

Dimension	Impact Factor	Impact indicators relevant to the Nepalese land market based on the interview responses	Impact on the land market as identified through the questionnaire
Economic	Transaction Cost	Changes in the cost of transaction	Transaction cost increased (−ve)
		Changes in the time of transaction	Transaction time increase (−ve)
	Valuation	Changes in the price of residential land	Price of residential land increased (−ve)
		Changes in the price of agricultural land	Price of agricultural land decreased (+ve)
		Price speculation due to land categorisation or subdivision restriction	Price speculation increased (−ve)
	Mortgage Availability	Accessibility of land property as collateral	Accessing the loan through real estate collateral decreased (−ve)
		Number of blacklisted landowners	There was rise in the number of blacklisted landowners (−ve)
		Changes in the financial strength of the financial institutions	Financial strength of the banks and financial institutions decreased (−ve)
		Number of landowners who received the loan from financial institutions.	Number of landowners who received the loan from financial institution decreased (−ve)
	Taxation	Changes in land tax	Land tax increased
		Penalties for no use of the land	Landowners were partly penalised (−ve)
	Compensation	Sufficiency of the compensation paid for loss due to subdivision restriction	Compensation against the loss of subdivision restriction was not paid (−ve)
		Sufficiency of compensation for loss due to road expansion	Not sufficient (−ve)
		Time required for the payment of compensation.	The time for the compensation decision was long
	Awareness	Conflict between sellers and buyers due to lack of awareness of land use regulation	The number of court cases increased (−ve)
		Dispute between clients and staff over the failure of parcel subdivision	Argumentation increased (−ve)
	Expectation	Ease of the subdivision approval process	Acquiring the subdivision approval became too difficult (−ve)
		Number of court order cases for subdivision approval	The number of court orders increased (−ve)
Social	Proximity	Satisfaction of landowners due to distance to the workplace	Landowners dissatisfied due to increase in walking distance to the workplace (−ve)
		Satisfaction of landowners due to travel time to the workplace	Landowners dissatisfied due to increase in time taken to travel to workplace (−ve)
		Changes in the number of landowners/buyers in the land market.	Number of participants decreased in an area (−ve)
Environmental	Risk reduction	Changes in the flood-risk area in the Kathmandu Valley	Flood risk area in the Kathmandu Valley decreased (+ve)
		Changes in the supply of flood-safe plots in the Kathmandu Valley	Risk consideration in urban development supplied flood-safe plots in the Kathmandu Valley (+ve)
	Quality of Residential Land	Supply of residential land with added open space in land pooling areas	Supply of residential land with added open space in land pooling areas increased (+ve)
		Change in the supply of residential land with added enhanced road and utility infrastructure	The supply of residential land with added enhanced road and utility infrastructure increased (+ve)
		Change in the land value of quality residential plots compared to surrounding unplanned areas	Land value of quality residential plots compared to surrounding unplanned areas increased (+ve)
	Suitability of Zoning Classification	Sufficiency of land allocated for non-agricultural purpose	Land allocated for non-agricultural purpose was not sufficient (−ve)
		Changes in the number of housing construction on unplanned agricultural land	Construction on agricultural land increased in unplanned areas (−ve)

Dimension	Impact Factor	Impact indicators relevant to the Nepalese land market based on the interview responses	Impact on the land market as identified through the questionnaire
Institutional	**Lot Size**	Number of available parcels qualifying for the market transaction	Number of available parcels qualifying for market transaction decreased (−ve)
		Changes in the number of land transactions involving parcels bigger than the enforced threshold size	The number of transactions involving larger-sized land decreased due to lot size control (-ve)
		Changes in the accessibility to land rights	The accessibility to land rights decreased (−ve)
	Subdivision Restrictions	Changes in the number of land parcels subdivided	Availability of parcels through subdivision decreased (−ve)
		Accessibility to the adjoining parcel to use for road purposes (ease of the use of land)	Accessibility to the adjoining parcel to use for road purposes (ease of the use of land) decreased (−ve)
		Number of informal transactions	Number of informal transactions increased (+ve)
	Coordination	Number of private lots affected by road expansion	Number of private lots taken partly by the road expansion increased (−ve)
		Number of court cases against the road expansion for securing property rights	Number of court cases relating to property rights violations increased (−ve)

The impact scores for each indicator given by all 180 respondents were averaged to yield the average score for each indicator, using the following equation:

$R_{avg} = \frac{\sum_1^n v_i}{180}$, where v_i is the rating ($-3 \leq v_i \geq 3$) assigned by a respondent for the relative changes produced by the indicator associated with an impact factor. The mean impact score at the impact factor level was then calculated using the average score rating derived for each indicator. The mean impact score for each impact factor (R_{mis}) is calculated as:

$R_{mis} = \sum_1^m (R_{avg})/m$, where m is the number of indicators associated with the impact factor under consideration (Equation 4-3). The mean impact score is presented in Table 5-9.

Table 5-9: Mean (average) impact score calculated for each impact factor

Land market impact factor	Mean impact score (IMS) for each impact factor	Standard deviation
Compensation	−0.8639	1.721
Valuation	−0.9653	1.793
Mortgage Availability	−1.3722	1.223
Transaction Cost	−1.2667	1.100
Taxation	−0.5264	1.216
Awareness	−0.7889	1.643
Expectation	−1.3139	1.540
Proximity	−0.2389	1.265
Risk Reduction	0.3889	1.710
Quality of Residential Land	1.0278	1.203
Suitability of Zoning Classification	−0.6361	1.485
Coordination	−1.5296	1.467
Subdivision Restrictions	−0.9426	1.713
Lot Size	−0.9194	1.297

The mean impact score represents the direction of the impact but does not show any depth of impact on the land market as it does not consider the weights of the impact factors. To find the impact of land use regulation on the land market produced by each indicator, the impact ratings need to be combined with the corresponding weights, to derive impact indices for each impact factor, which is performed in AHP.

5.4. Using AHP to Determine Impact Indices

This section presents the impact of land use regulation on the land market through the application of the analytic hierarchy process. Section 5.4.1 discusses the criteria for the land market assessment and then how the Nepalese land market impact assessment scenario was framed in the hierarchical structure of AHP, based on the interview findings.

The interview process enabled the refinement of the impact factors and indicators across the four dimensions. These impact factors then helped frame the questionnaire survey that was provided to 180 stakeholders across the various sectors of the Nepalese land market. Section 5.3 provided a descriptive summary of the outcome of the survey results across the range of stakeholders. However, different stakeholders do not perceive these impact factors and dimensions as having the same importance or weight

because they participate in the land market differently. These stakeholders have different roles and interests in the land market. AHP provides a mechanism to weight the impact factors based on the relative importance or rank assigned to each. Section 5.4.2 discusses the data scale and weighting process that was used to rank the impact factors across the four dimensions through the survey. It then presents the average ranks of dimensions and impact factors and describes how the average ranks were transformed into their weights, which were then used to prioritise the impact factors.

Section 5.3.8 discusses the impact score ratings as observed by the stakeholders in the land market. Not all of the impact factors have the same degree and direction of impact on the land market. Moreover, stakeholders generally would not have a uniform perception of the degree of impact produced by the impact factors in terms of its depth and direction. With this difference in perception, they would assign a different impact score to each impact factor and indicator. In the first part of the section, the data scale applied in collecting the impact score through the questionnaire survey is discussed. This is followed by a presentation of the relative changes in the land market that occurred as a result of the introduction of land use regulation. Finally, the section presents the mean impact score for each impact factor.

Section 5.4 combines the composite weight derived with the mean impact score of an impact factor to produce the impact of each impact factor across a given dimension. The impact of land use regulation is discussed in two ways: firstly, as the impact for each impact factor, and, secondly, as the impact identified by the respondent groups across each dimension.

5.4.1. Criteria of Impact Assessment

The application of the analytic hierarchy process (AHP) enables the assessment of multiple criteria of assessment. Based on the refined impact factors and associated indicators, the following criteria for assessing the impact on the land market were defined.

a) Across the economic dimension, stakeholders perceived that land use regulation had caused changes in land value, tax, and mortgage availability. Stakeholders also experienced changes in their economic strength due to issues of compensation and transaction cost.

b) Across the social dimension, land use regulation caused stakeholders' satisfaction or dissatisfaction. They perceived that land use regulation may promote conflict or create court cases depending on the level of awareness, the degree of expectation met and proximity of the residents to their workplace. Residents' proximity may change the number of participants in the local land market.

c) Across the environmental dimension, risk reduction, suitability of land zoning and supply of quality residential land can result in changes in environmental safety and the demand, supply and value of land generally in the land market.

d) Across the institutional dimension, it was found that the strategies and implementation approaches adopted, such as coordination, subdivision restriction and lot size control, affect ownership rights, land availability and accessibility to land in the Nepalese land market.

With these criteria, the impact scenario of the land market was framed in the hierarchical structure of AHP where impact factors across the economic, social, environmental and institutional dimensions played a role in producing changes in the land market (Figure 5-17). The four dimensions and the 14 impact factors were called alternatives in the AHP.

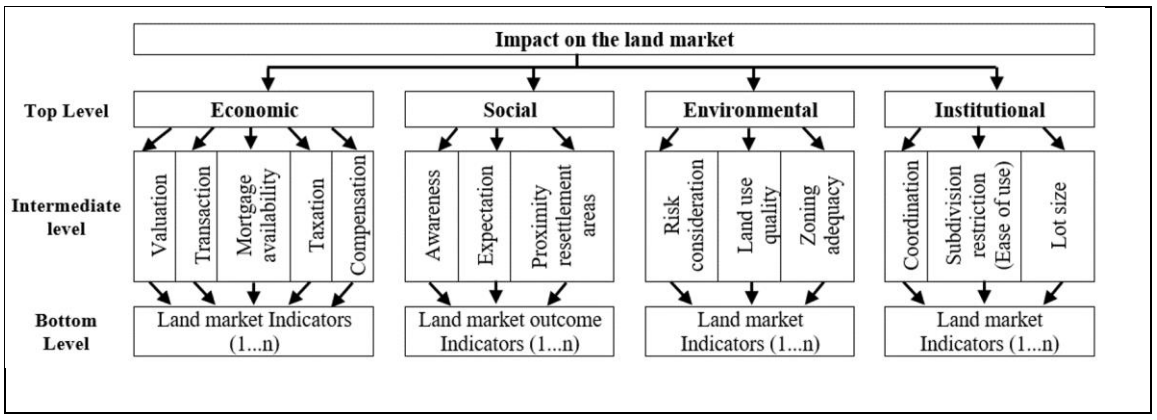


Figure 5-17: Hierarchical arrangement of alternatives in AHP

5.4.2. Ranking and Weight Derivation

AHP allows the varying impact of the introduction of land use regulation across the four dimensions of the land market to be assessed. To determine the differential impact across each dimension and impact factor, the weight of each of these alternatives was

derived by using the calculated average rank. This rank was calculated using the raw rank data derived through the survey. Ranked data identifying the importance level of each dimension and each impact factor was provided by the stakeholders and aggregated into a rank allocation table (RAT) (Appendix 4 – Questionnaire Questions 9, 9.1, 9.2 and 9.3). Each row of the table consisted of a pair of items that stakeholders ranked relatively.

A scale with nine rank levels was adopted to assign the relative importance to each dimension and impact factor in AHP (Table 5-10) similar to that described by Saaty (1983). The nine-level range for ranking enabled stakeholders to incorporate subjectivity, experience and knowledge into the measurement framework intuitively and naturally, rather than using a scale with a smaller range.

Table 5-10: Relative scale of importance used for ranking (Saaty, 1983)

Rank	Definition	Explanation
1	Equal importance	Two impact factors contribute equally to the land market
3	Moderate importance	Slightly favours one over the other
5	Essential or strong importance	Strongly favours one over another
7	Demonstrated importance	The dominance of demonstrated importance in practice
9	Extreme importance	Evidence favouring one over the other of highest possible order of affirmation
2, 4, 6, 8	Intermediate values	When compromise is needed in ranking

The total number of rows in the RAT was determined by calculating the combination of alternatives to be ranked through pairwise comparison. For the ranking of dimensions, the total number of paired combinations in the priority matrix was ${}^{4}C_{2} = 6$. Consequently, all six possible paired combinations of the dimensions were formed and placed in the rank table for rank data collection (see Appendix 4 – Question 9). The rank score collected in each RAT was based on the data scale presented above in Table 5-10. The central column of the RAT shows equal importance. The left side specifies a higher rank score, whereas the right side specifies a lower rank score.

The distribution of ranks for each pair of the alternatives at the dimension level assigned by each of the 180 respondents was examined and is shown in Figure 5-18 (see Appendix 5 for the distribution of ranks of impact factors across each dimension).

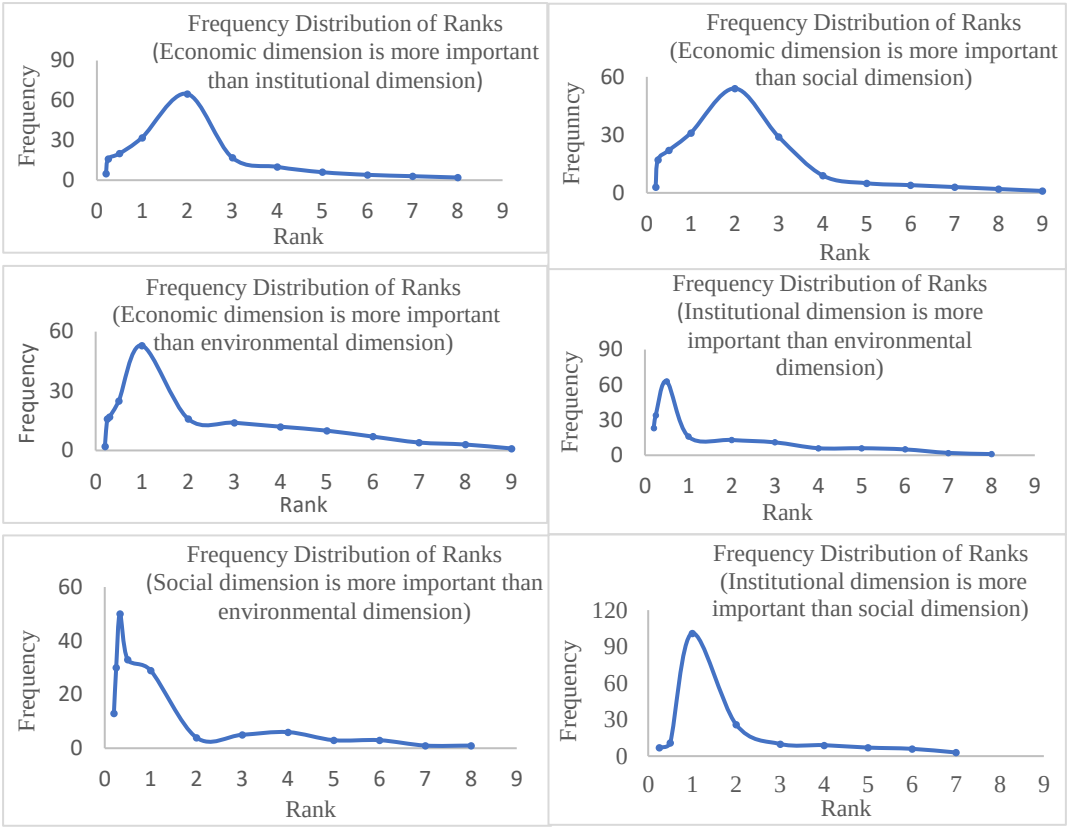


Figure 5-18: Distribution of the raw rank data for each combination of dimensions

The ranking of the alternatives at the top level of the hierarchy of AHP suggests that the majority of Nepalese land market stakeholders ranked the economic dimension highest. The majority of the respondents thus assigned a rank greater than 1 to the economic dimension (i.e., the higher value lies towards the left of the rank allocation table) compared to the other dimensions, which suggests that the land use regulation impacted the land market more strongly in the economic dimension. The ranking also found that the majority of participants assigned a lower rank to the social dimension than the environmental and institutional dimensions. The institutional dimension was also ranked lower than the environmental dimension.

Table 5-11 summarises the average rank derived from the pairwise comparisons. In terms of figures, the economic dimension was ranked 1.3770 times more important than the environmental dimension, 1.3981 times more important than the institutional dimension, and 1.4392 times more important than the social dimension. The institutional dimension was ranked 1.3350 times higher than the social dimension but lower (0.6636) than the environmental dimension. Finally, the social dimension was ranked 0.5242 times the importance level of the environmental dimension, which

indicates that the social dimension is perceived as having the lowest importance in the Nepalese land market. (See Appendix 6 for the calculated average rank of impact factors.)

Table 5-11: Calculated mean rank of each pair of dimensions

Pair of dimensions compared	Average rank
Economic dimension more important than institutional dimension	1.3981
Economic dimension more important than social dimension	1.4392
Economic dimension more important environmental dimension	1.3770
Institutional dimension more important than social dimension	1.3350
Institutional dimension more important than environmental dimension	0.6636
Social dimension more important than environmental dimension	0.5242

The above ranks were transferred to a pairwise comparison matrix to progress to the derivation of their weights (Table 5-12), as discussed in Section 4.3.3 of Chapter Four.

Table 5-12: Pairwise comparison matrix of ranks of dimensions

Dimensions	Economic	Social	Environmental	Institutional
Economic	1.0000	1.4392	1.3770	1.3981
Social	0.6949*	1.0000	0.5242	0.7491*
Environmental	0.7262*	1.9077*	1.0000	1.5070*
Institutional	0.7152*	1.3350	0.6636	1.0000
Total	3.1363	5.6818	3.5648	4.6542

*These ranks are the inverse of those in Table 5-11. Therefore, they read: social dimension is 0.7491 times more important than institutional dimension; and environmental dimension is 1.5070 times as important as institutional dimension.

The pairwise comparison matrix was then transferred to a normalised matrix where each cell was normalised by ensuring the sum of rank values in each column amounted to 1 (Table 5-13). The average of each row of the normalised rank matrix gives the weight of each dimension.

Table 5-13: Normalised rank matrix

					Sum	Weight of Dimensions (W_d)
Economic	0.3188	0.2533	0.3863	0.3004	1.2588	0.3147
Social	0.2216	0.1760	0.1471	0.1609	0.7055	0.1764
Environmental	0.2316	0.3357	0.2805	0.3238	1.1716	0.2929
Institutional	0.2281	0.2350	0.1861	0.2149	0.8640	0.2160
Total	1	1	1	1		1

The calculated weights were checked for their consistency by calculating the consistency ratio (CR)—the ratio of the consistency index (CI) to the random index (RI) (Saaty, 1983). The CI was calculated by deriving the largest Eigenvalue (λ_{max}) of the comparison matrix and is given by $CI = \lambda_{max} - n/(n\text{-}1)$. It was found that the derived weights qualified as they passed consistency checking with a consistency ratio less than 0.1. All of the calculations to identify weights of dimensions and impact factors, as well as consistency checking, are provided in Appendix 7.

The calculated weight of each impact factor across each dimension is termed 'local weight' (the term used by Dey (2002)), because it was confined within a given dimension. For the overall prioritisation of impact factors across all dimensions, the composite weight of each impact factor was derived. The composite weight of an impact factor (C_{Wi}) was calculated as the product of the weight of a given dimension (W_d) times the local weight of the impact factor (W_i) associated with that dimension:

$$C_{Wi} = W_d * W_i \ldots\ldots\ldots \text{(Equation 4-2)}$$

The weight of each dimension, the local weight, and the calculated composite weight has been listed in Table 5-14.

Table 5-14: Calculated weights of dimensions and impact factors

Dimension	Weight of Dimension (W_d)	Impact Factor	Local Weight (W_i)	Composite Weight (C_{Wi}) = ($W_d * W_i$)
Economic	0.3147 (31.47%)	Compensation	0.4270	0.1344
		Valuation	0.2625	0.0826
		Mortgage availability	0.1539	0.0484
		Transaction Cost	0.0956	0.0301
		Taxation	0.0610	0.0192
Social	0.1764 (17.64%)	Awareness	0.6368	0.1123
		Expectation	0.2830	0.0499
		Proximity	0.0802	0.0141
Environmental	0.2929 (29.29%)	Risk reduction	0.5813	0.1703
		Quality of residential land	0.3053	0.0894
		Suitability of zoning classification	0.1135	0.0332
Institutional	0.2160 (21.60%)	Coordination	0.5676	0.1226
		Subdivision restrictions	0.2872	0.0620
		Lot size control	0.1451	0.0313

The correlation coefficient (Spearman's rank correlation) calculated between the normalised local weight and the composite weight was found to be +0.94 (see

Appendix 8), which indicates that the composite weights were not significantly affected by the order of the local weight. From the distribution of the weights of the impact factors, it was apparent that the impact factor of 'risk reduction' had the highest weight. This suggests that the stakeholders identified hazard risk mapping associated with land use regulation as a very sensitive issue. The primary purpose of the amendment of the *Land Use Policy* in 2015 was to include risk-sensitive land use planning and designate risk zones on the land use map. With the ever-present threat of seismic events, landslides and flooding in Nepal, risk reductions are of utmost importance.

After risk reductions, the issues of compensation and coordination were identified as the next important. A well-coordinated implementation of land use planning with adequate awareness of land use regulation protects stakeholders from the loss of their property rights. Good coordination can assure landowners that they can make timely decisions with regard to their land.

The issues of changes in the quality of residential land, subdivision restrictions, social expectations, mortgage availability, suitability of zoning classification, and lot size control were located midway in the list of weights. The implementation of land use restrictions affected the use right or property right, either by enforcing the land classification, the subdivision or lot size control. Transaction costs and taxation were not identified to be as important as other economic, environmental and institutional factors. The issue of proximity received the least weight and only related to local areas in hazard or disaster zones.

5.4.3. Derivation of Land Market Impact by Combining the Composite Weight and Impact Score

The land market impact for each impact factor (I_{imf}) was calculated by multiplying its composite weight (C_{Wi}), shown in Table 5-14, with the corresponding mean impact score (R_{mis}) already presented in Table 5-9.

i.e., $I_{imf} = (C_{Wi}) * R_{mis}$ ……. (Equation 4-4)

The calculated impact index for each impact factor is shown in Table 5-15.

Table 5-15: Calculated impact index across dimensions and impact factors

Impact Factors	Calculated Impact Index	Dimension	Calculated Impact Index across dimension
Compensation	−0.1161	Economic	−0.311
Valuation	−0.0797		
Mortgage Availability	−0.0665		
Transaction Cost	−0.0381		
Taxation	−0.0101		
Awareness	−0.0886	Social	−0.158
Expectation	−0.0656		
Proximity	−0.0034		
Risk Reduction	0.0662	Environmental	0.137
Quality of Residential Land	0.0919		
Suitability of Zoning Classification	−0.0211		
Coordination	−0.1875	Institutional	−0.275
Subdivision Restrictions	−0.0585		
Lot Size	−0.0288		

Having calculated the impact associated with each impact factor, the total impact on the land market across a given dimension is given by:

$I_{imd} = \sum_1^t (I_{imf})$ ..... (Equation 4-5)

Table 5-15 above also aggregates the impact of all impact factors across a given dimension. It was found that, from the stakeholders' perspective, the impact of land use regulation on the Nepalese land market was most pronounced in the economic dimension with a negative impact of −0.311. The next negatively impacted dimension was the institutional dimension (−0.275), which was followed by a negative impact across the social dimension (−0.158). The only positive impact on the Nepalese land market was found to be across the environmental dimension (+0.137).

The results show that the Nepalese land market was impacted negatively across twelve impact factors and positively across two—'Risk Reduction' and 'Quality of Residential Land' in the environmental dimension (Figure 5-19). The positive impact across the environmental dimension is attributed to changes brought about by improvements in road widths and the allocation of river zones along rivers which reduced risks to residential developments and added open space. These widened roads improved road accessibility, reduced congestion and added to land values.

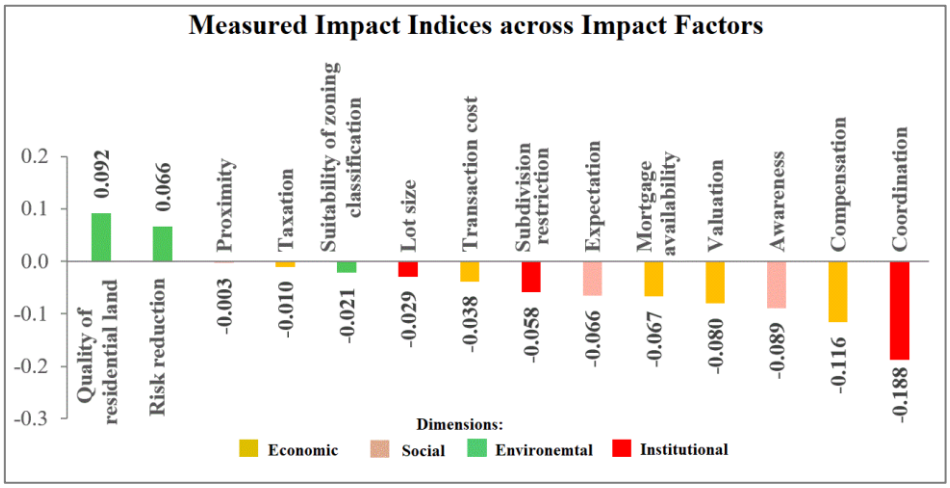


Figure 5-19: Impact indices of impact factors in the Nepalese land market

The negative impact across the economic dimension is attributed to the lack of compensation for the land that was compulsorily acquired, higher land costs, and increased difficulty in using mortgages to access the land market. The negative impact across the social dimension is due to the dissatisfaction of the stakeholders with poor implementation and communication, which contributed to their lack of awareness and increased conflict between the landowners and buyers.

The negative impact across the institutional dimension is attributed to poor coordination between the agencies and local stakeholders that led to the limited sharing of information about land zoning, buffering and restrictions on the land. The national directive for pricing and distribution of spatial data restricted the sale of land zoning data to reduce land speculation. The lack of information-sharing contributed to poor decision-making and slow agency responses during land transactions, encouraged informal transactions and resulted in the reduced access to land.

5.4.3.1. Impact across the Stakeholder Groups

Analysis of the impact results conducted separately for the private sector, banks and financial institutions, and implementation authorities revealed that perceived impact varied according to the stakeholders' role in the land market (Table 5-16). The variation has been reflected in the impact results across all dimensions. The private sector registered the greatest negative impact across the economic, social and institutional dimensions, whereas the implementing authorities had the lowest negative

impact across the same dimensions. The impact across the environmental dimension was positive for all groups, with the implementing authorities indicating the most positive impact. Although there was a variation in the impact indices derived separately for the three different sectors participating in the study, there was consistency in the trend and the direction of the impacts derived for all sectors across all dimensions.

Table 5-16: Impact indices across the respondent group

Sectors	Economic	Social	Institutional	Environmental
Private sector	-0.407	-0.202	-0.371	0.076
Bank and financial institutions	-0.345	-0.184	-0.311	0.143
Implementing authorities	-0.180	-0.086	-0.143	0.192

5.5. Chapter Summary

This chapter presented the results of the interview and questionnaire survey to understand the stakeholders' views on the impact of land use regulation in the Nepalese land market. The interview data enabled a refinement to 14 impact factors across the economic, social, environmental and institutional dimensions. These impact factors were then used as a basis to seek input from three main stakeholder groups to measure the impact of land use regulation within their sectors.

Using AHP, the degree and direction of the impact of land use regulation on the land market in Nepal from the stakeholders' perspective was measured. Relative changes in the land market associated with each impact factor were analysed to arrive at an impact score. The AHP-derived weights of the impact factors were combined with each impact score to calculate a land market impact index for each impact factor and dimension. It was found that stakeholders perceived that the land market in Nepal has been negatively impacted by land use regulation across the economic dimension (−0.311), the institutional dimension (−0.275) and the social dimension (−0.158). The only positive impact on the Nepalese land market was found to be across the environmental dimension (+0.137). This chapter utilised the stakeholders' perspective to measure the impact of land use regulation on the land market and therefore answered the third research question and achieved the third research objective. The chapter partly provides answers to the fourth research question as well.

The next chapter will present the impact of land use regulation on the land market using archival records and documentary evidence, which will assist in validating or complementing the impact findings derived from stakeholders' perspectives.

Chapter 6: Analysis of the Changes in the Nepalese Land Market based on Documentary Evidence

6.1. Introduction

The previous chapter discussed the measurement of land use regulation on the land market in Nepal based on various stakeholders' perspectives. However, stakeholders have natural biases due to their particular interest or position in the land market. The previous chapter also discussed perspectives-based findings that may change according to the role and stake of the stakeholders in the land market. The land market impact assessment based on the stakeholders' judgement only needs to be balanced with other evidence. Therefore, collecting documentary evidence or secondary data which identifies the changes in the land market caused by the introduction of land use regulation is important. This chapter presents the impact of land use regulation in the Nepalese land market by using archival data, as specified in Section 4.3.2.5. Data was collected from government agencies, financial institutions and other accessible sources. The results are then analysed following the methods described in the Section 4.3.3.5 and discussed.

6.2. Economic Dimension

6.2.1. Land Valuation

Each Land Revenue Office under the Department of Land Management and Archive (DOLMA), Ministry of Land Management, Cooperatives and Poverty Alleviation (MOLMCPA) Nepal, publishes threshold land values of all privately owned land within its jurisdiction. Based on this official valuation, a buyer needs to pay land transfer tax during a land transaction. The market value of land usually differs from the official valuation and continues to vary due to changes in the demand and supply of land.

DOLMA does not publish the transaction price of land paid by buyers, and access to all land records is not possible due to privacy restrictions. A request was made to DOLMA to provide the transaction price data of 2500 representative sample lots from around the suburban municipalities of Kathmandu Valley for the period July 2011 to July 2019. The Survey Department provided a recommendation letter explaining that the data would be used only for this research. The Land Revenue Offices of Kathmandu, Lalitpur and Bhaktapur districts provided the data to the DOLMA office. The datasets provided by DOLMA were received through the Geographic Information Infrastructure Division (GIID), Survey Department, under the condition that they would be used for no other purpose than this study. The sample data covers fiscal years before and after the introduction of the *National Land Use Policy 2012* and the subdivision restrictions of 2017. The suburban municipalities of the Kathmandu Valley were chosen for the sample data collection because of a higher transaction frequency than in the downtown areas of the Kathmandu and Lalitpur Metropolitan City in the Valley (Appendix 10).

The statistics of the transacted land price (maximum, minimum and median) of the sample lots from the suburban areas of the Kathmandu Valley for the period of nine years (2010–11 to 2018–19) is shown in Figure 6-1.

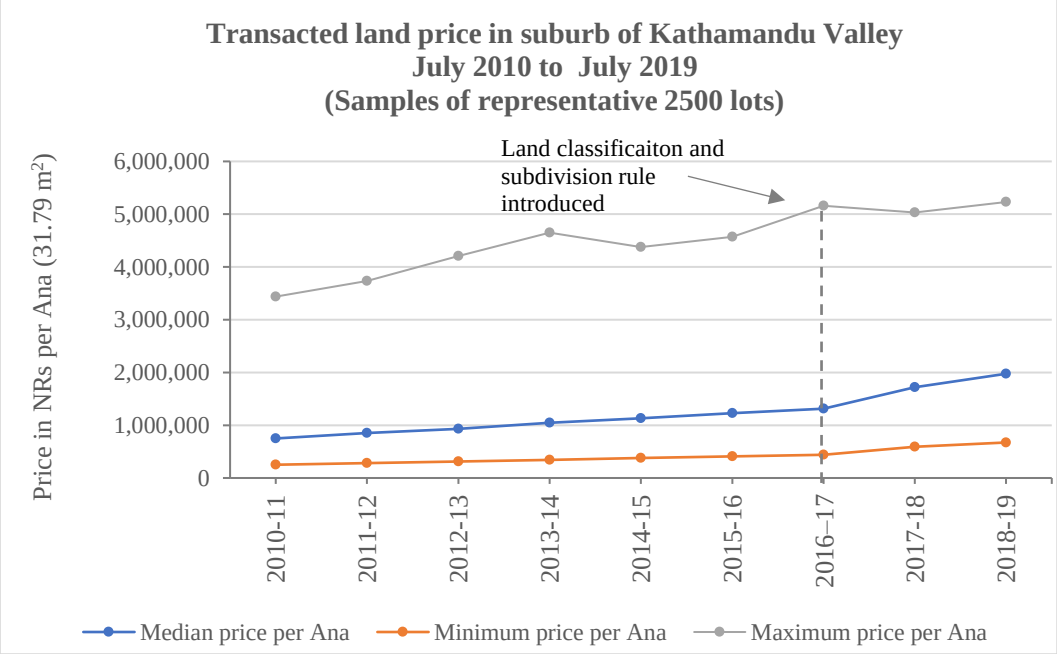


Figure 6-1: Transacted land price in the Kathmandu Valley

(Data source: DOLMA, 2019)

The data shows a wide gap between the minimum and maximum transacted price for every year. The overall distribution indicates that the median land price in 2018–19 grew by 263% over 2010–11 in the Kathmandu Valley. The median price of land shows a gradual upward trend of 7–8% until the end of 2016–17, and then suddenly increases significantly with an annual rise of 31% in the land price in 2017–18, which continues with a 14.5% increase in 2018–19.

In 2011–12, the Government of Nepal introduced the National Land Use Policy, which accelerated the expansion and widening of roads across the Kathmandu Valley. At the end of 2016–17, subdivision restrictions and land categorisation were enforced, which tightened the subdivisional market. Since the introduction of this control, the land price data indicates an overall increase in the median land price (per Ana) based on the sample data.

The distribution of the price per square metre of a transacted lot (calculated from the local unit of Ana) versus its total area for the 2015–16, 2016–17 and 2017–18 fiscal years is shown in Figure 6-2. The demand curve for each cluster shows a shift in each consecutive year. However, the shift in the unit price from the 2016–17 fiscal year to the 2017–18 fiscal year is higher than the shift between 2015–16 and 2016–17, indicating that the subdivision restriction caused a shift in the land price greater than the usual trend of change. This shift is particularly evident for the smaller parcels of land (less than 300 m^2). The correlation coefficient calculated with the unit lot price (NRs/Ana) and the transacted lot size was −0.34 (calculated for the period from 2015–16 to 2017–18).

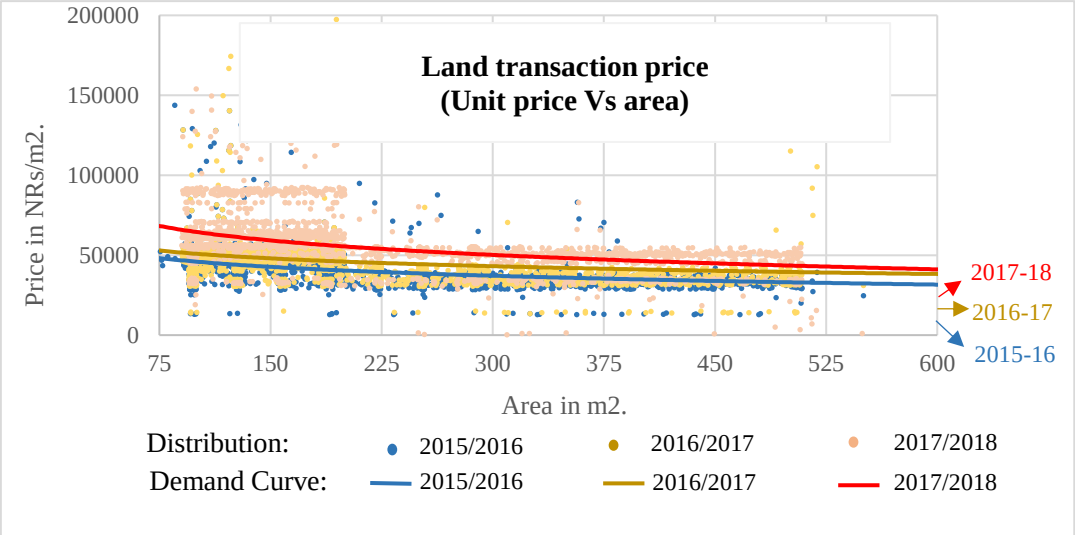


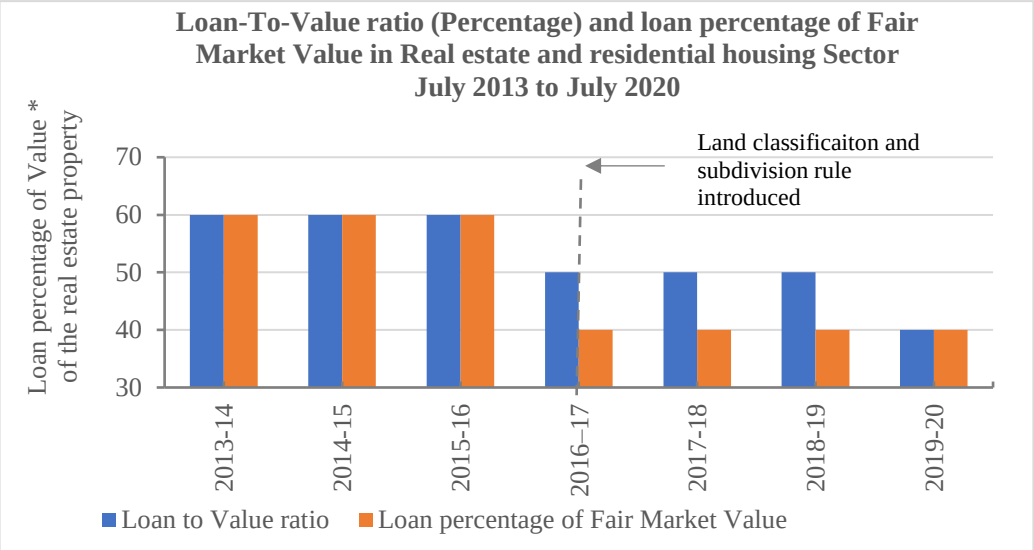
Figure 6-2: Changes in the transacted value of land before and after land use restriction

Data source: Department of Land Management and Archive, 2020

6.2.2. Mortgage Availability

Banks and financial institutions (BFIs) play a key role in the land market in Nepal. These institutions provide loans to landowners by mortgaging their land and buildings (fixed assets) as collateral for the loan. BFIs perform a risk assessment before they proceed with a mortgage. The availability of a mortgage depends on factors such as the perceived financial risk in using the land as collateral, financial strength of BFIs in the market, and the borrower's capacity to repay the loan as assessed by the institution. BFIs first consider the fair market value (FMV) of the land under consideration and then determine the value of the land for mortgage purposes. The values specified by BFIs are less than the market values because of the risk considerations. BFIs apply the loan-to-value ratio (LTV) rule as per their existing policy in determining the actual loan amount (Timilsina, 2014).

To explore whether there was any change in mortgage availability after the enforcement of the subdivision restriction, the LTV ratio and loan percentage of FMV were examined for seven consecutive fiscal years: 2013–14 to 2019–20 (Figure 6-3).



(*The absolute values determined by BFIs for loan purpose differ from their FMVs; however, they have been represented at the same scale here because of percentage representations.)

Figure 6-3: Share of fixed asset collateral in the Nepalese financial market

(Data source: Financial Stability Reports 2014–2020, Nepal Rastra Bank)

The data shows a decrease in loan percentages from 60% to 40% of FMV in the Kathmandu Valley, introduced by the Nepal Rastra Bank (NRB) in 2017. NRB is the Federal Reserve Bank (FRB) in Nepal. The Reserve Bank also changed the ceiling on the maximum loan amount by reducing the LTV ratio from 60% to 50% in the Kathmandu Valley (Nepal Rastra Bank, 2017) following the subdivision restriction in Nepal in 2017. To further reduce the loan ceiling, in 2020 the bank also reduced the loan amount by capping the LTV ratio at 40% of the assessed value of the real estate property, which restricted mortgage availability in Nepal even more.

6.2.2.1. Changes in Loan Exposure to the Real Estate Business and Residential Housing Sectors

Capping applied on the FMV and the regulation of the loan amount through the LTV ratio determine the loan amount received by an individual borrower and indicate mortgage availability. A loan borrowed from a financial institution using land and buildings as fixed asset collateral may not necessarily be used to invest in land or real estate business. Therefore, I collected the figures of the absolute loan amounts issued by BFIs for real estate and residential housing purposes and examined the percentage changes year-on-year (Table 6-1).

Table 6-1: Real estate and residential housing loans in Nepal

Fiscal year	Absolute real estate and housing loan amount (In billion NRs)	Change in loan amount (in billion NRs)	Percentage change of loan year on year
July 2013 – July 2014	82.5		
July 2014 – July 2015	85.7	3.2	3.9%
July 2015 – July 2016	108.1	22.4	26.1%
July 2016 – July 2017	127.3	19.2	17.8%
July 2017 – July 2018	142.0	14.7	11.6%
July 2018 – July 2019	146.0	4.0	2.8%
July 2019 – July 2020	163.5	17.5	12.0%

Data source: Financial Stability Reports, 2014–2020, Nepal Rastra Bank

The data show a gradual growth in absolute loan amounts over seven years, with the maximum loan amount in the July 2019 to July 2020 fiscal year. However, the percentage change on a year-on-year basis shows a maximum change of 26.1% in the July 2015 to July 2016 period and a minimum change of 2.8% in the July 2018 to July 2019 period. Although the data show no remarkable changes in the land transaction volume in the Kathmandu Valley during the 2014–15 to 2015–16 fiscal years (detailed in Section 6.4.3, Figure 6-21), these variations reflect the situation in light of the amendments of the *National Land Use Policy 2012* and the enforcement of subdivision restrictions in 2017, as discussed below.

In April 2015, a major earthquake hit Nepal that destroyed more than 600,000 dwellings across 32 hilly districts, including those within the Kathmandu Valley. Following the disaster, the Government of Nepal amended the *National Land Use Policy 2012* to address the resettlement and relocation of those whose houses were affected (Government of Nepal, 2015b, p. 1). The government also set a maximum concessional loan of NRs 300,000 at 0% interest and NRs 1.5 million at 2% interest outside the Kathmandu Valley. For the landowners in the Kathmandu Valley, the maximum accessible housing reconstruction loan was NRs 2.5 million at a 2% interest rate (National Reconstruction Authority, 2017). Documentary evidence indicates a doubling in housing constructions in the Kathmandu Valley during July 2015 to 2016 (See Figure 6-21). There was also a rise in new housing construction at the national level by about 50%, from approximately 28,000 to 39,500 dwellings, as shown by the data on economic activity in Nepal (Nepal Rastra Bank, 2016b). The increase in the real estate loan by 26.2% in the 2015–16 fiscal year without any remarkable changes

in the land market indicates that the loan flow might have been directed towards the construction of new houses and reconstruction of the earthquake-damaged buildings, which could be a subject of further investigation.

In July 2017, the Government of Nepal introduced subdivision restrictions and the land classification system which lowered land availability in the land market, as shown by the reduction in the total number of land transactions. This decline in the land supply caused a relative decrease in the demand for loans in the July 2017 to July 2018 period. However, during the same period, residential housing approvals approximately doubled in the Kathmandu Valley, which contributed to increasing the loan amount by 11.6% despite the low land supply in the market.

Furthermore, landowners gradually adopted other legal options of acquiring land, such as court orders, family inheritance or divorce proceedings (discussed in Section 6.3 of this report). These pathways contributed a supply of land to the market that partially filled the gap between demand and supply. However, the number of housing approvals did not increase in 2018–19 compared to previous years, while the market saw an increase by 2.8% in real estate and housing loans in the same period.

There are several possible explanations for the increase in loan amounts in 2019–20 by 12.0%: an increase in the supply of land without subdivisions, a rise in housing constructions, and an increase in the number of subdivision-based land acquisitions, all of which could have caused borrowers to draw more loans from BFIs. However, in light of the absence of land and housing transaction data beyond 2018–19, it could not be analysed here and therefore remains a potential subject of future research.

6.2.2.1. Number of Loan Borrowers

The number of homeowners who took out a loan for land purchase and residential housing versus the absolute loan amount released for the real estate and housing construction sector was also examined (Figure 6-4). The data showed a decrease in the number of real estate loan borrowers (−4.6%) despite an increase in the total amount of loans released after the restriction in 2016–17. This suggests that the increase in the absolute loan amount may not necessarily reflect the changes in mortgage availability.

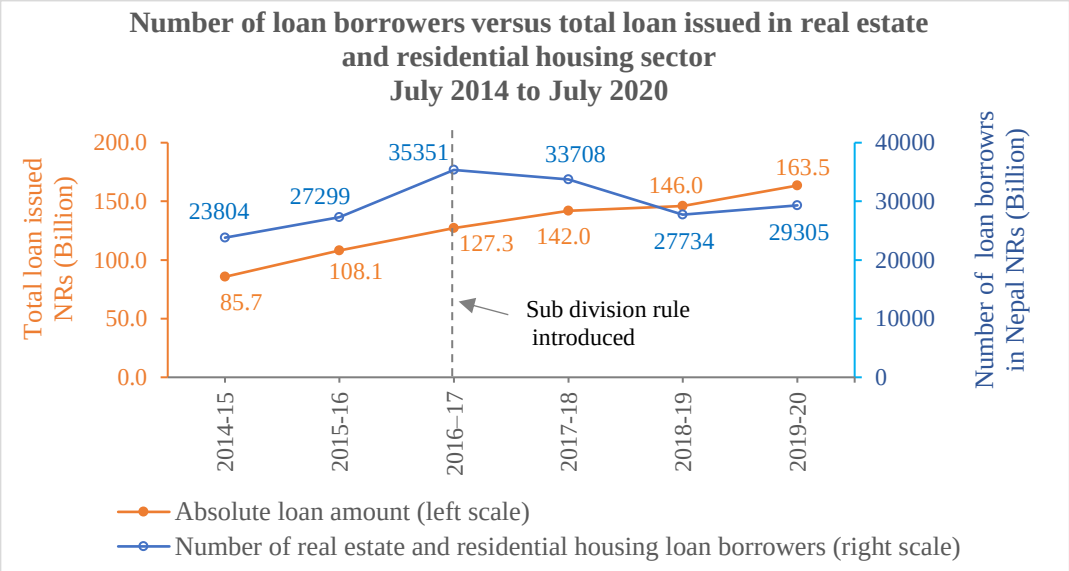


Figure 6-4: Loan borrowers, and real estate and residential housing loan

Data source: Nepal Rastra Bank (2020)

6.2.2.2. Changes in Non-Performing Loans and Blacklisted Borrowers

A non-performing loan (NPL) is understood as a 'bad loan' due to the failure of a borrower to repay the loan to the financial institution. Such a loan is difficult to recover, even though the collateral is taken as security. In Nepal, BFIs must report to the Credit Information Bureau (CIB) any information regarding borrowers who fail to repay their loans. The CIB then identifies borrowers as blacklisted in a shared database so that other BFIs can quickly access information on the borrower if the borrower attempts to access a loan from other BFIs.

The distribution of NPLs in the Nepalese BFIs shows significant change in the years after the introduction of land use restrictions (Figure 6-5). The NPL trend decreased from NRs 37 billion in the 2014–15 fiscal year to NRs 36.1 billion in the 2016–17 fiscal year. However, after the introduction of land use restrictions, the NPL reached NRs 44.18 billion in 2018–19.

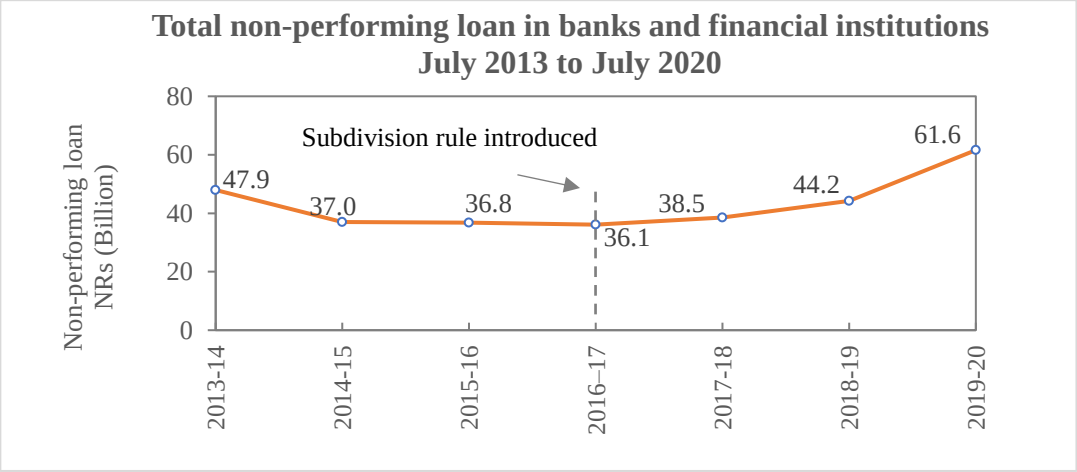


Figure 6-5: Non-performing loans in banks and financial institutions

Data source: Financial Stability Reports 2013-2019, Nepal Rastra Bank

The number of blacklisted borrowers collected from Nepal Rastra Bank indicated a rise in each successive fiscal year between 2013–14 and 2018–19 (Figure 6-6). However, there was a continuous decline in the relative change in numbers of blacklisted borrowers for each consecutive budgetary year until 2016–17. The data show a relative increase in the number of blacklisted borrowers after 2016–17.

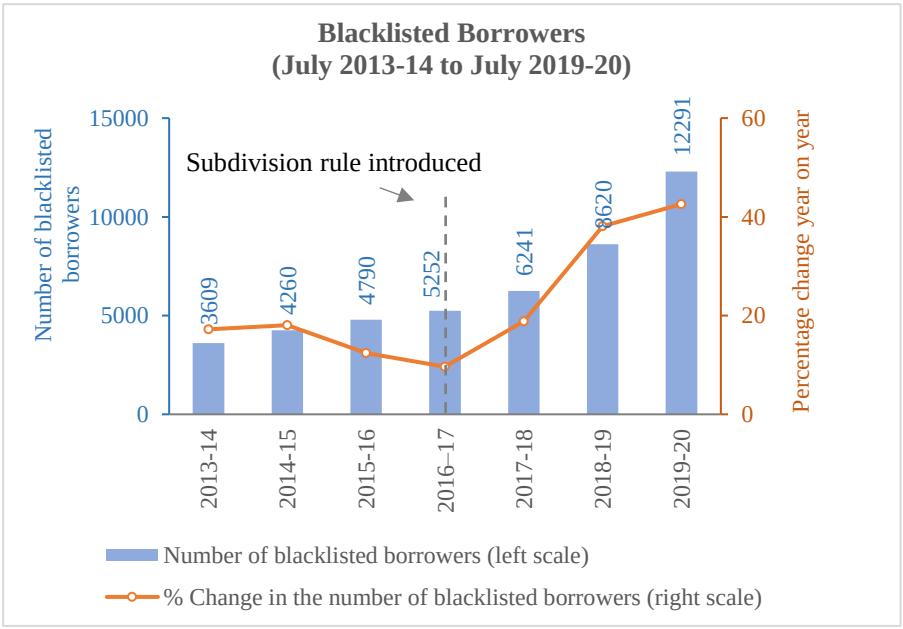


Figure 6-6: Blacklisted borrowers

Data source: Annual Reports 2015- 2020 Nepal Rastra Bank

The correlation coefficient calculated between the number of blacklisted borrowers and NPLs observed by the financial institutions is 0.98 (Appendix 11). Similarly,

calculating the correlation coefficient for NPLs and changes in real estate and residential housing loans yields a negative correlation with a coefficient of −0.95 (Appendix 12), which indicates that an increase in NPLs is associated with a decrease in real estate loan availability. These two results indicate a correlation between the number of blacklisted borrowers and in real estate loan availability (calculated coefficient 0.83, Appendix 13), thus raising investment risk in the real estate sectors.

With an increased risk to loan repayment, BFIs reduced the loan value from 60% to 40% of FMV and LTV ratio from 60% to 50%, along with the introduction of subdivision restrictions in 2017 for the Kathmandu Valley. The LTV ratio was further decreased from 50% to 40% in the Kathmandu Valley in 2019. A decrease in the LTV ratio indicates a decrease in the amount of loan available for land which would potentially receive a greater loan amount before the introduction of subdivision restrictions. In summary, the Nepalese land market experienced a decrease in mortgage availability after the introduction of land use regulation.

6.2.3. Transaction Cost

Acquiring a parcel of land or property in Nepal, as in many other countries, involves a series of transactions and associated costs. Apart from the price of the land itself and various taxes that the landowner and the buyer are required to pay during the land transaction, there are other direct and indirect costs that buyers and sellers incur during land transactions. Nepal's *Good Governance Act 2008* (Government of Nepal, 2008) mandates that government offices provide information about the fees and timeframes that apply to their services through a Civil Citizen Charter. The Citizen Charter at the Land Revenue and Survey Office provides a detailed statement of each service offered, the procedure to be followed by service users for obtaining the service, the estimated time taken to provide the service, the designation of the officer responsible for providing the service and his/her office location, and the details of the fees or any other amount to be paid, if any, for receiving the service. The Citizen Charters and other documentary evidence available at the Land Revenue and Survey Offices were examined to determine if there were any changes in the land transaction cost after the introduction of land use regulation in Nepal.

6.2.3.1. Changes in Transaction Time

The investigation of the Citizen Charters of the Land Revenue and Survey Offices revealed that no changes were made to these documents after the introduction of land use regulation. Based on the activities specified in these Citizen Charters, there were three key steps to follow for a land transaction before the introduction of the land use regulation: (i) application submission, (ii) processing of the application (internal verification and payment) and (iii) approval or disapproval. The transaction process required for a single land parcel was different from the process required for a subdivision.

Based on the information from DOLMA, a transaction request for a single land parcel was processed only within the Land Revenue Office. For the transaction of a single land parcel, field verifications were not required. The request for the Transfer of Rights was usually finalised within a business day. However, for a lot requiring subdivision, internal verification was carried out to confirm the subdivisional boundaries. An internal verification was undertaken by a designated Surveying Officer authorised to confirm the lot category, its area and boundary.

For external verification, the Survey Office makes a formal request to the KVDA to confirm whether the parcel boundaries match the adjoining road boundary and awaits a response before approval. After the introduction of land use regulation, these verifications take longer to complete for subdivisions as there was no such requirement prior to regulation. Table 6-2 summarises the steps followed for the land transfer activity and time required. The table identifies that the internal and external verification processes have contributed to delaying the overall land transaction timeline when a subdivision is performed.

Table 6-2: Summary of activities and time required for a land transaction in Nepal

Process	Activities	Average time required (days)	
		Before the enforcement of land classification and subdivision restriction	After the enforcement of land classification and subdivision restriction
1. Submission	Check and verify the document. For a whole-lot transaction request, no boundary verification is required. For a subdivision case, LRO forwards the application to the Survey Office	1	1
2. Process	The Survey Office processes the application (field book, plot register, map check, area verification)		
	On-site verification and confirmation of lot boundary by the staff of survey office and owners of adjoining land parcel	3	3
	Verification of land use category	Not required	3
3. External verification	Contact Kathmandu Valley Development Authority and confirm road and river buffer zone	Not required	14
4. Approval	Send the report and application file to the Land Revenue Office	1	1
	Pay service fees, Transfer Tax, Capital Gains Tax		
	Completion of transaction process at LRO		
	Total time taken for land transaction	**5**	**22**

The fieldwork required for land use verification and confirmation through the KVDA were identified as additional steps in the transaction process that increased the average transaction time for a parcel subdivision in Nepal from five to 22 days. An average time of five days for the registration of property in Nepal before the land use restrictions agrees with the timeline specified in the World Bank's *Doing Business* reports (World Bank, 2014, 2017). However, subsequent reports do not reflect the time required to verify the land use category and to confirm the road zone boundary. The reason for this may be that the existing Citizen Charters were not updated to reflect the changes in the time required for a land transaction after the introduction of land use restrictions.

The enforcement of land use categories based on the cadastral records of 1964 also required landowners to verify land use situations on the ground and update the land

category in the land records. A report by the Commission for the Investigation of Abuse of Authority highlighted that the restriction on subdivision provided an opportunity for authorities to deliberately delay the subdivision of a qualifying parcel, which also contributed to increasing the time required for approval (Commission for the Investigation of Abuse of Authority, 2020).

In summary, it was found that there was an overall increase in the transaction cost of buying land through the subdivision process after the enforcement of land use regulation. This increase in cost was the result of the increase in transaction time from less than a week to more than three weeks because of the verification process required to confirm the land use category, and parcel boundary checks. Having to make multiple visits to the Land Revenue Office and Survey Office likely also increased the overall transaction cost for customers.

6.2.4. Taxation

Data from government records identified four different results relating to taxation and revenue collection after the introduction of land use regulation in Nepal: changes in the transfer tax, changes in the annual land tax, changes in revenue collection, and penalties for 'no use' of land. These issues are discussed below.

6.2.4.1. Changes in Land Transfer Tax

It was found that there was no change in the rate of land transfer tax after the introduction of land use restrictions in Nepal. Land transfer tax, which was levied at a rate of 4.5% of the transaction price for land registration purposes in municipal areas and at 5% in metropolitan areas, remained unchanged. However, changes in land value caused an increase in the transfer tax a landowner had to pay during transactions. Figure 6-7 presents the land transfer tax for the unit area of land (1 Ana = 31.79 m^2) calculated for the median land transaction price derived from the 2500 sampled parcels for each fiscal year from 2010–11 to 2018–19 (the same sample of data as discussed in Section 6.2.1).

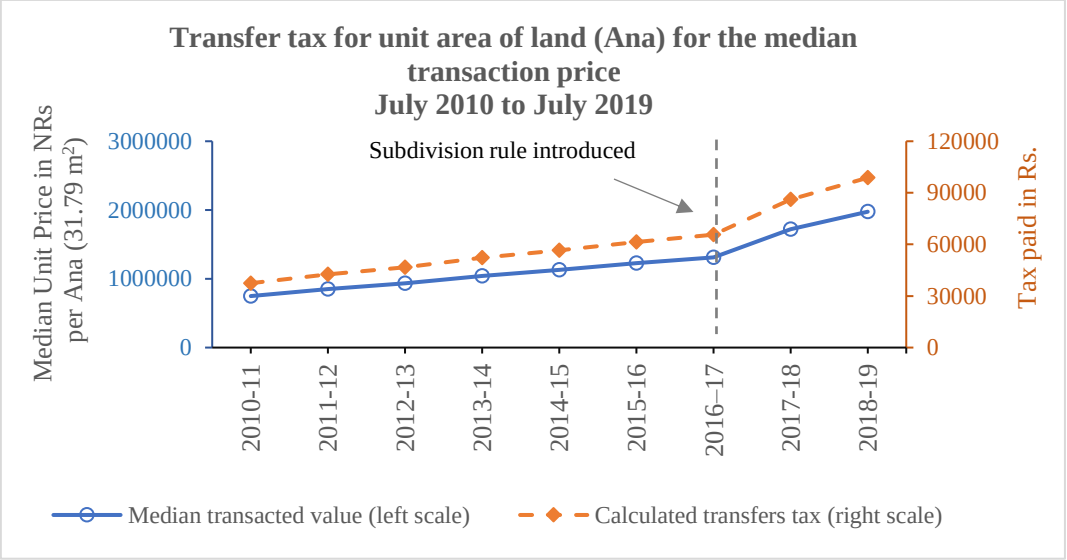


Figure 6-7: An increase in transfer tax due to increasing land value

Although there was no change in the transfer tax rate after the introduction of land use regulation, the value per Ana of land transfer tax increased for most land parcels due to the rise in property valuations caused by land use restrictions.

6.2.4.2. Changes in the Annual Land Tax

In Nepal, annual land tax is levied by local governments – metropolis, sub-metropolis, municipalities and village committees. Each local government passes an annual budget that determines the land taxation for the fiscal year. However, annual tax rates are levied differently across the Kathmandu Valley. For example, the Kathmandu Metropolitan City increased the annual land tax according to its self-classified land use categories (in terms of classes A, B, C, D & E as shown in Figure 6-8) after the introduction of the subdivision restrictions, whilst Bhaktapur municipality continued with the same (area-based) annual land tax after the introduction of land use regulation (Figure 6-9).

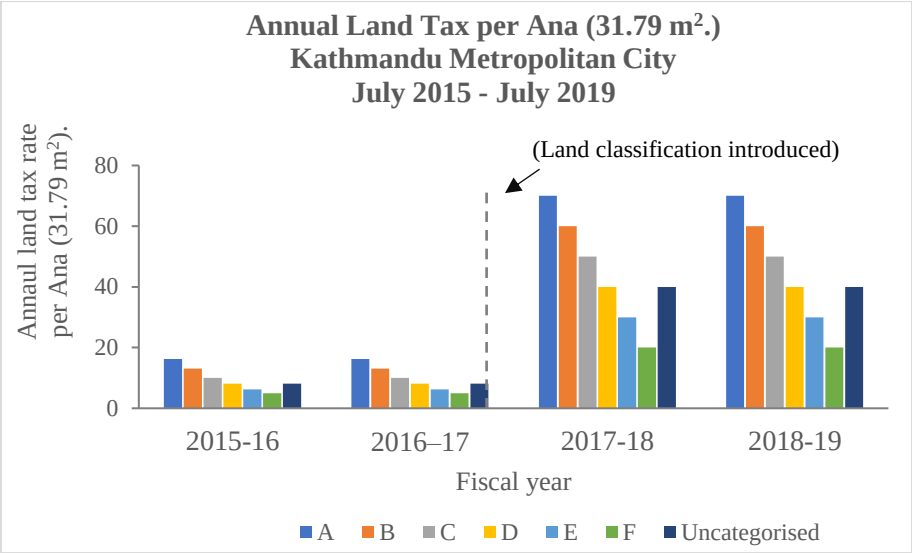


Figure 6-8: Annual land tax in Kathmandu Metropolitan City

Data source: Kathmandu Metropolitan City Office, 2018

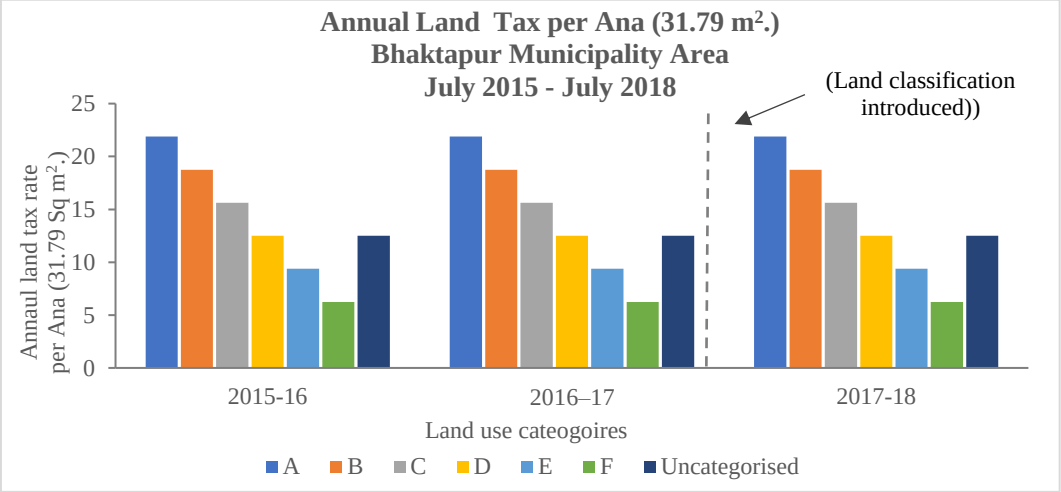


Figure 6-9: Annual land tax in Bhaktapur Municipality

Data source: Bhaktapur Municipality Office, 2018

The annual tax rates of two municipalities were not enough to determine the overall distribution of annual taxes across the Kathmandu Valley; however, they do indicate that the annual tax collection remained independent of the introduction of land use regulation across the Kathmandu Valley.

6.2.4.3. Changes in Land Revenue Collection

The Land Revenue Office in each district collects transfer tax, capital gains tax (for land of value more than NRs 3 million) and other necessary service fees as land

revenue during a land transaction. The revenue data collected by the Land Revenue Offices of Kathmandu, Lalitpur and Bhaktapur show an upward trend in the relative collection of revenue up to the year 2016–17 across the Kathmandu Valley (Figure 6-10). Total revenue collected by the Land Revenue Offices in Kathmandu and Bhaktapur districts decreased in 2017–18 compared to the previous year. Lalitpur showed an increase in revenue collections after the introduction of subdivision restrictions; however, the increase was smaller relative to the previous year (2016–17).

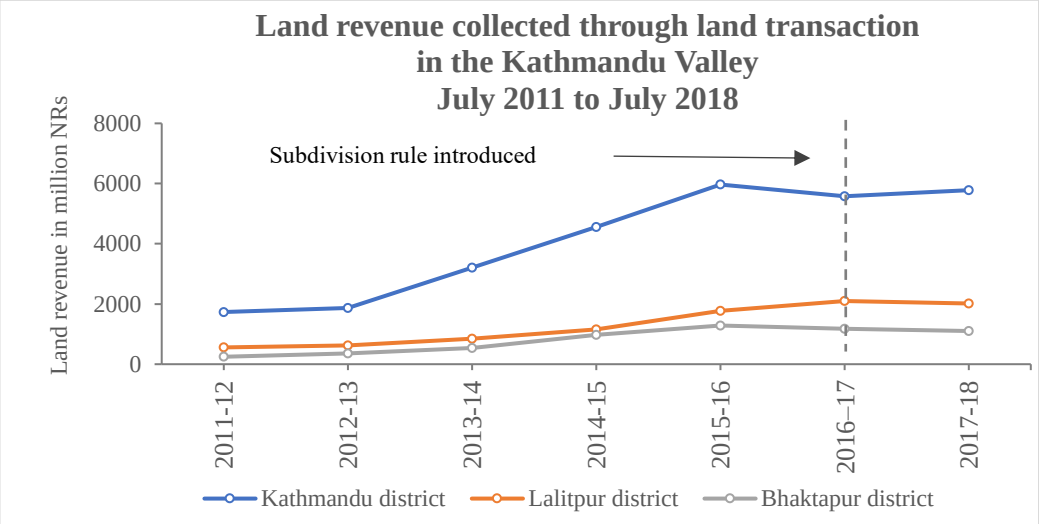


Figure 6-10: Land revenue collection in Kathmandu Valley

Data source: Annual Report (2014–2019), Nepal Rastra Bank

6.2.4.4. Penalties for 'No Use'

The *Land Use Policy 2015* and the *Land Use Act 2019* classify land into various categories and give permission to local authorities to impose fines if land is not used for a specific purpose. Local governments can issue fines of up to NRs 100,000 if agricultural land is left barren for a period of up to three years without the owner informing the local government. However, the data show that only two municipalities—Godawari and Dakshinkali of Lalitpur and Kathmandu districts, respectively—were found to have set the penalty charge for leaving land unused following the enforcement of land categorisation at the end of the 2016–17 fiscal year. The rate of the penalty set by Godawari and Dakshinkali for the 2016–17 fiscal year were NRs 12 and NRs 16 per Ana (31.79 m^2) of land. Owing to an increase in the value of land, the municipalities increased the penalties to NRs 25 and Rs 63 (per Ana)

for the 2017–18 fiscal year. However, no records were found about the amount of penalty fees collected by those municipalities.

6.2.5. Compensation

Compensation for land acquired for a public purpose is addressed by the *Land Acquisition Act* (His Majesty's Government of Nepal, 1987) in Nepal. As per Article 3 of the Act, government authorities are required to pay compensation to affected landowners for land acquired for public purposes. Two types relating to compensation in the implementation of land use regulation were identified:

(i) compensation relating to cases where zoning was enforced without land acquisition, and

(ii) compensation relating to cases where zoning enforcement was associated with land acquisition.

Enforcement of land classification, subdivision restrictions and lot-size control did not require any acquisition. Therefore, no compensation was paid for the loss caused by zoning decisions that did not involve any land acquisition. However, these provisions did restrict landowners' ability to sell their land when they needed to do so. Landowners who challenged the decision and went to court to appeal the decision in 2017 were unsuccessful. Although there is no provision for the implicit loss that a landowner may sustain as a result of the introduction of land use regulation, the *National Land Use Policy 2012* (article 8.2.7) specifies the provision of compensation or subsidies to motivate landowners to use their land for agriculture in light of the growing interest of landowners in real estate and housing development through land fragmentation (Government of Nepal, 2015b).

However, the government's continued efforts to provide concessional agricultural loans, subsidies on chemical fertilisers and improved seeds (Himalayan News Service, 2016; Government of Nepal, 2018a; Timalsina, 2019) could not attract land buyers to the agricultural land market, as demonstrated by the growing occupation of residential land compared to the depletion of agricultural land in the Kathmandu Valley (Rimal et al., 2017; Upreti et al., 2017). This suggests that the landowners' growing interest in the residential land market, despite the government's effort to motivate them to

agricultural activities through providing compensation and subsidies, as specified in the *National Land Use Policy* 2012 and 2015, was not sufficient for the motivation.

Regarding the second types of compensation, the case of road zone expansion was explored. The *National Land Use Policy 2012* explicitly requires a buffer space along the right-of-way (RoW) of roads and rivers in Article 8.4.3. The policy also specifies the execution of control measures if construction on the land does not meet the specified standard set by the KVDA. These provisions were to support the KVDA in accelerating the road expansion process, which did not progress for more than a year after its commencement. Although the Kathmandu Valley Town Development Committee (KVTDC) initiated the road zone expansion in 2011, the project only gained momentum after the KVTDC's organisational transformation into the KVDA and the introduction of the *National Land Use Policy* in 2012.

The report on the road-widening project published by the KVDA specifies that it acquired the land for NRs 50,920 million for road widening (Kathmandu Valley Development Authority, 2015a). However, KVDA records show that an amount of NRs 870 million was paid in compensation to the landowners. The total value of the land cleared by the KVDA for the road expansion and the compensation paid by the KVDA for the loss as assessed shows a gap in the payment in terms of the insufficiency of the compensation and time delay (Khanal et al., 2017; Kharel, 2017; Poudel, 2018; Kamat, 2019; Shrestha, 2019). The *Constitution of Nepal 2015* (Government of Nepal, 2015a, Article 25) overrules individual property rights when the implementation of land use regulation is concerned and thus implicitly supports the implementation of land development projects that involve land acquisition without sufficient compensation. These policy provisions became a weakening factor in landowners' financial capability. This case study reflects many of the concerns expressed by the various stakeholders which were documented in the previous chapter.

6.2.6. Summary of Changes in the Land Market Across the Economic Dimension

Based on the documentary evidence and archival records relating to the changes in the land market discussed in previous sections, the following changes were seen in the Nepalese land market across the economic dimension (Table 6-3).

Table 6-3: Changes across the economic dimension shown by records

Impact factors	Changes identified in the land market
Compensation	Compensation was partially paid. Compensation demanded NRs 50,920 million versus paid compensation of from NRs 87 million was not sufficient.
Mortgage availability	Non-performing loans increased NRs 36.1 billion before subdivision restriction 2017 to NRs 38.5 billion after the subdivision restriction.
	Loan-to-value ratio decreased 50% to 40%; fair market value from 60% to 40%.
	Percentage of loans issued to real estate decreased approximately by 15% in the period July 2016-17 to July 2017-18.
	Number of blacklisted borrowers increased from 5552 to 6241 in the year following the subdivision restriction and land classification.
	Number of real estate and residential housing loan borrowers decreased from 35351 to 33708 after the enforcement of land classification and subdivision restriction despite the total number of loan accounts in all sectors having increased.
	Absolute loan amount supplied for the real estate sectors increased but percentage loan year-on-year decreased.
Taxation	Transfer tax to be paid increased with the land value despite no changes in the tax rate.
	Changes in the annual tax was mixed across the Kathmandu Valley. Mostly there was no change in the annual taxes as they were area-based. In some cases, changes in the annual tax were seen based on the use of classes A, B, C, D, E, F and uncategorised.
	Some of the municipalities enforced penalties following the *National Land Use Policy 2012*. However, the rate of penalties set for not using the land was negligible.
	There was a decrease in the relative collection when compared for each consecutive fiscal year. A small increment in the land revenue occurred despite a decrease in the transaction volume.
Transaction Cost	Transaction time increased from five days on average to 22 days for a subdivision-based land transaction. There were no changes for whole-lot transactions.
	Additional cost increased for the land transaction.
Valuation	Land value increased by 31% as calculated from the median land value of the three different sets of 2500 samples of parcels before, at and after the introduction of land use regulation in Kathmandu Valley.
	Demand for residential land increased or shifted from left to right. There was a higher demand for smaller parcels than for larger parcels. Correlation coefficient calculated with the unit lot price (NRs/Ana) and the transacted lot size was -0.34 (calculated for the period from 2015–16 to 2017–18).

6.3. Social Dimension

The documentary evidence collected across the study area showed that the impact of land use restriction on subdivision and the enforcement of land use classification resulted in conflict with various stakeholders and subsequent court cases. Two factors—stakeholders' lack of awareness of new land use restrictions and poor implementation—were key factors in disputes and court cases between land market stakeholders. A third factor, which related to the resettlement of landowners from high-risk to lower-risk areas and thereby moved them further away from their workplaces, caused dissatisfaction among the affected residents. The following sections present the

information and data collected from various government agencies in relation to the social dimension of the impact of land use regulation.

6.3.1. Stakeholders' Lack of Awareness of Land Use Regulation

A key document supporting the social impact of the introduction of land use regulation was a report by the Commission for the Investigation of Abuse of Authority (2020, P. 1). This report recommended that the subdivision restriction be lifted, and a review of the enforced land categorisation be undertaken. The document, in its Statements 2 and 3, specifies that many stakeholders have not correctly understood the provisions of the subdivision restriction and are confused:

> Although the Ministry decided to enforce the subdivision restriction to control the subdivision of agricultural land, people are still not clear of the category of land that can undergo a subdivision. The concerned agencies have also failed to provide correct information to the people that a lot may qualify for a subdivision only once in a given fiscal year.

The above statements indicate that the land market stakeholders did not have a clear understanding of the subdivision restrictions that would be implemented. Due to their lack of awareness, landowners continued to buy and sell land despite these restrictions. In some cases, buyers paid deposits to landowners through land brokers. When the land transaction could not occur due to the subdivision restrictions, buyers would request the return of their deposit. Many buyers who did not receive their refund filed court cases against the landowners.

The distribution of total court cases relating to the exchange of property for the fiscal years 2013–14 to 2018–19 shows a gradual growth trend. However, the court cases relating to the advances paid to landowners increased sharply across the district courts of Kathmandu Valley after the introduction of subdivision restrictions (Figure 6-11).

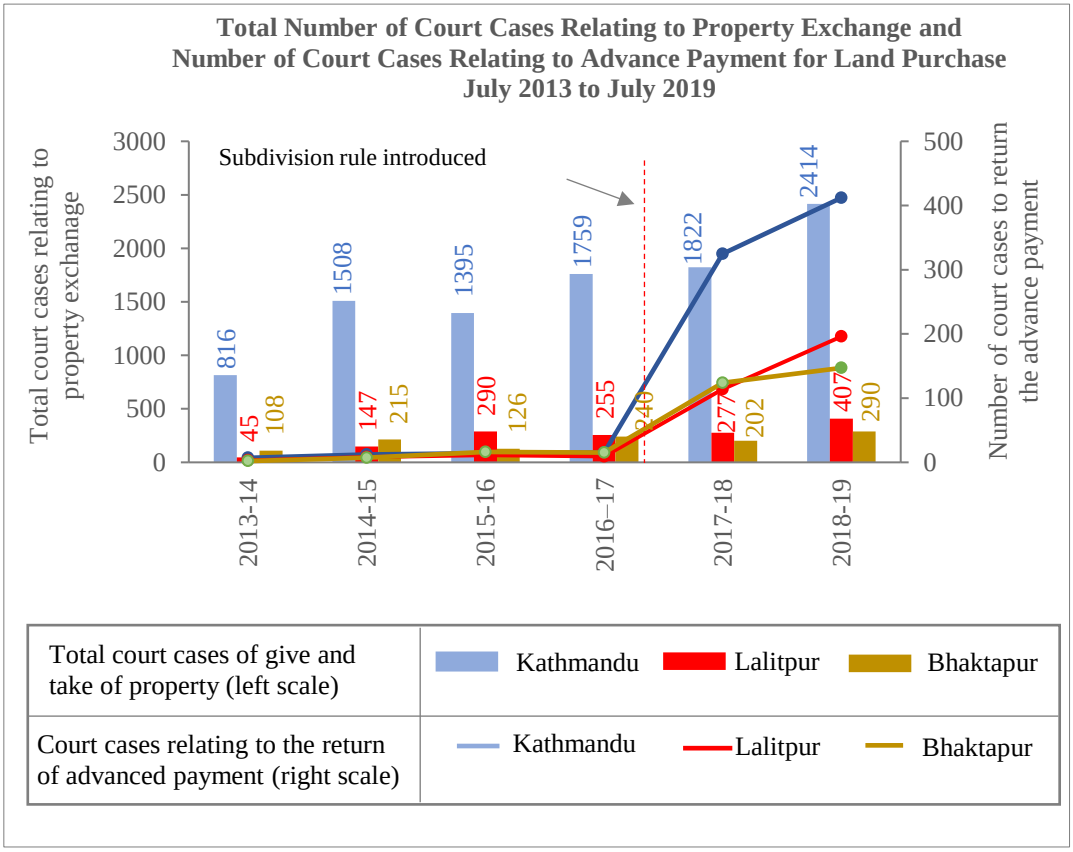


Figure 6-11: Court cases due to lack of awareness of land use regulation

Data source: District Courts of Kathmandu, Lalitpur and Bhaktapur (2014–2019)

The total number of court cases relating to property exchanges, as shown in the bar chart by the left scale, exhibits a gradual upward trend from the 2013–14 to the 2018–19 fiscal year. On the other hand, the trend in court cases relating to the return of the advance payment, as shown by the right scale, exhibits a sharp rise in all three districts of the Kathmandu Valley.

As the subdivision restriction did not allow re-fragmentation of land more than once in a fiscal year, landowners could not sell their land at the time when they needed to do so. They began following different legal pathways to acquire subdivision approval: landowners with joint ownership filed court cases. The distribution of the number of court cases reported by the district courts of Kathmandu, Lalitpur and Bhaktapur shows a slight increase in court cases in the 2017–18 fiscal year but a sharp increase in the 2018–19 fiscal year (Figure 6-12).

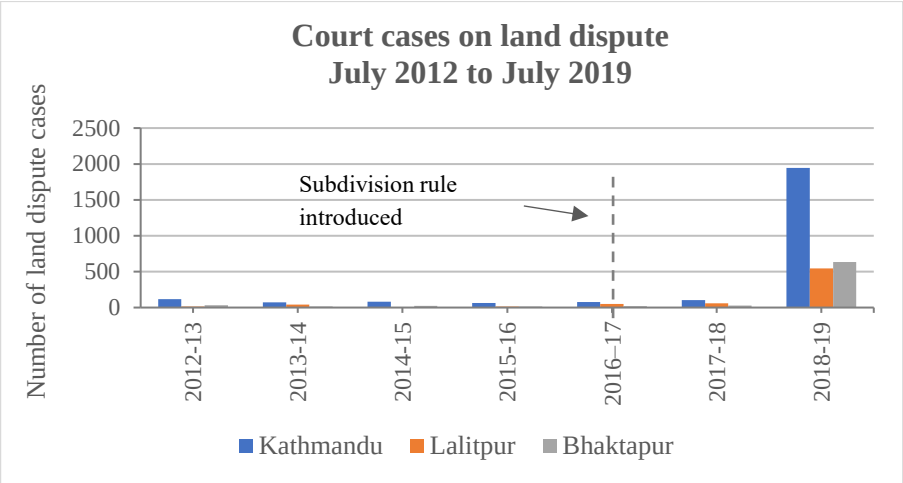


Figure 6-12: Number of court cases on land disputes in Kathmandu Valley

Data source: District Courts of Kathmandu, Lalitpur and Bhaktapur 2019

The increase in court cases was reflected in the recommendation by the Commission for the Investigation of Abuse of Authority (2020, P. 1) to the Ministry of Land Management, Cooperatives and Poverty Alleviation: 'Our courts have been overloaded with excessive land disputes because of the growing tendency of registering false cases to acquire court orders for the subdivision of jointly owned land.'

If stakeholders had been made aware of the land use restriction before its implementation, they would not have invested in land that would be difficult to use or sell afterwards. The court would also not have been inundated by land disputes and false cases.

6.3.2. Unexpected Social Outcomes

The documentary evidence shows that the introduction of land use restriction resulted in several unexpected social outcomes such as increased conflict between family members and divorce cases leading to family disintegration. Section 6.3.2.1 presents the results about the subdivision of inheritable land property. Section 6.3.2.2 discusses subdivisions followed by divorce cases.

6.3.2.1. Parcel Subdivisions Relating to Property Inheritance

The exclusion of the subdivision restriction for inheritance purposes encouraged joint tenants of properties to subdivide their land and bring it onto the land market. The

pressure of repaying loans to financial institutions or other lenders forced them to request their joint property share, which created conflict in families. Statement 6 in the recommendations provided by the Commission for the Investigation of Abuse of Authority (2020) to the Ministry of Land Management, Cooperatives and Poverty Alleviation reads:

> Subdivision restrictions have encouraged fragmentation of inheritable property through court orders, resulting in conflicts across families. There is a rise in break up of members, which has raised the risk of social disintegration across the country.

Figure 6-13 shows the distribution of court cases relating to property inheritance (left scale) and indicates a rise in court cases for family inheritance. The number of land parcels subdivided through inheritance requests (right scale) shows significant growth in the division of joint property owned by families. The sharp rise in parcel subdivisions for inheritance purposes after the introduction of subdivision restrictions indicates that land use regulation created an unnecessary social burden on families in the land market and resulted in conflict among family members.

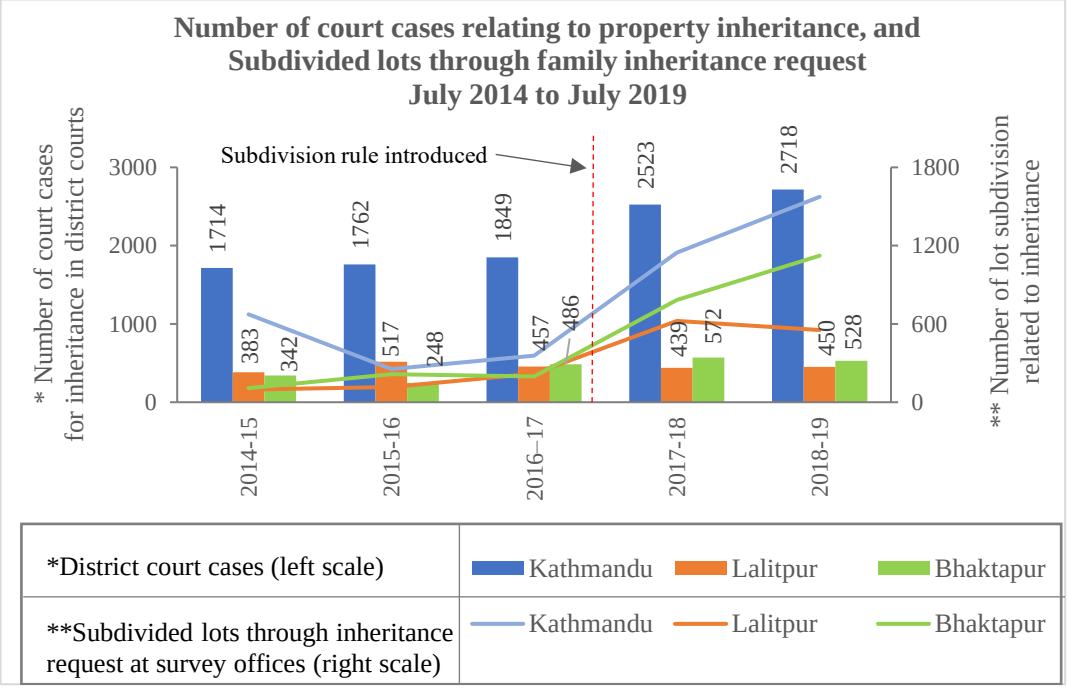


Figure 6-13: Court cases and parcel subdivision related to inheritance

Data sources: * District courts of Kathmandu, Lalitpur and Bhaktapur, 2019

** Survey offices of Kathmandu, Lalitpur and Bhaktapur districts, 2019

6.3.2.2. Subdivision Restriction and Divorce Cases

The distribution of divorce cases registered in the district courts shows relative growth after the subdivision restrictions (Figure 6-14, left scale). The data also shows a deflection in the subdivision trend followed by divorce (Figure 6-14- right scale).

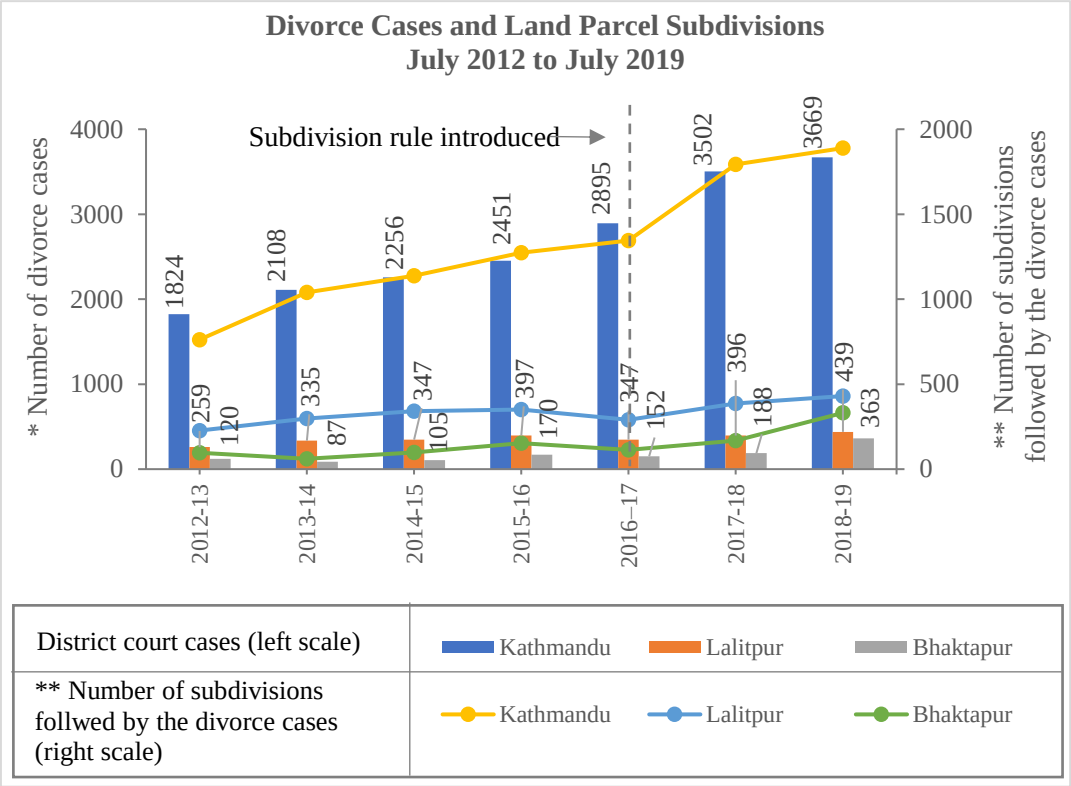


Figure 6-14: Divorce cases and parcel subdivisions followed by divorce cases.
Data sources: * District courts of Kathmandu, Lalitpur and Bhaktapur, 2019
** Survey offices of Kathmandu, Lalitpur and Bhaktapur, 2019

6.3.3. Proximity and Resettlement Areas

After the major earthquake in Nepal in 2015, the Government of Nepal amended the *National Land Use Policy 2012* to address the resettlement of people living in geological hazard areas. With the mandate of the reintroduced version of the *Land Use Policy 2015*, article 6(1), the National Reconstruction Authority (NRA) carried out vulnerability assessments in 31 earthquake-affected districts in Nepal where almost 600,000 houses were damaged. Partly damaged houses were demolished by rescue teams and new houses were built. The assessment team also advised the government that 299 settlements were identified as vulnerable to landslide hazards and that people

living in those areas needed to be relocated. The distribution of households recommended for relocation, the number of households relocated, and the average distance of the relocation areas from their existing dwellings was collected for this study from the National Reconstruction Authority (Figure 6-15).

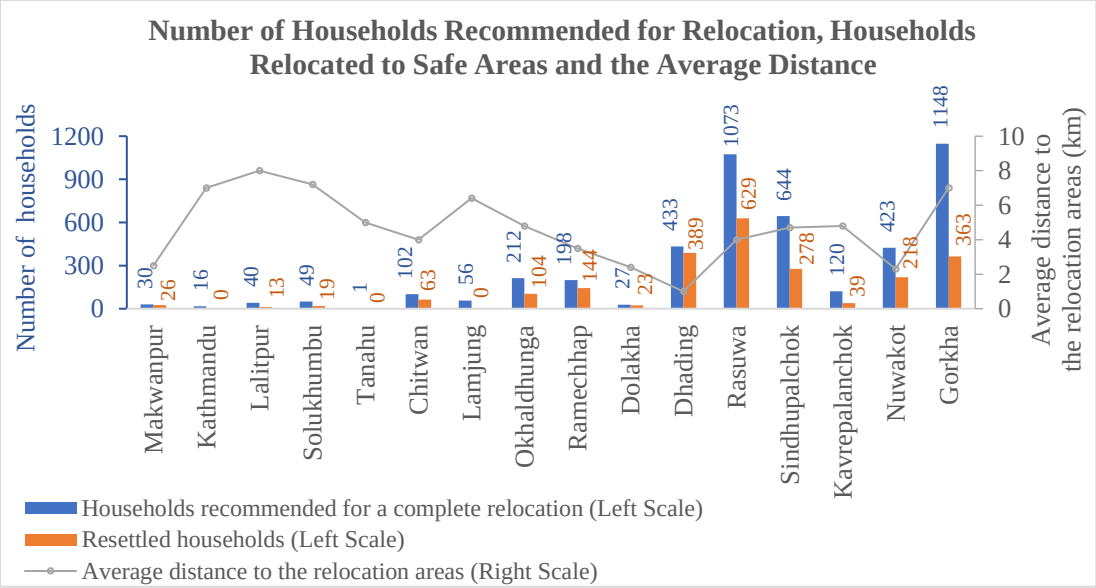


Figure 6-15: Number of households advised of resettlement versus average distance from the existing buildings to the relocated safe areas

Data source: National Reconstruction Authority, Nepal, 2018

The data show a weak correlation of 0.17 between the average distance and the households requiring relocation (Appendix 15). This weak positive correlation suggests that other factors that might have impacted the progress of relocation. The action plan recommended by the Displacement Solutions (2019, P. 10) emphasises alternative means of livelihood through capacity building as a motivating factor for resettlement when it states:

> In recognition of the fact that relocation/resettlement is always far more than mere movement of people from one place to another, emphasis should be placed on developing new capacity building programming in existing 'integrated settlements' created following the earthquake …

The reason for people's reluctance to being relocated to safe places is that the resettlement program only focused on the construction of low-cost houses for shelter without considering alternative means of livelihood. Those households that previously

engaged in agricultural activities at their original location found it difficult to commute to their land as the new site was much further than reasonable walking distance. With the low progress in the relocation process, the NRA advised landowners to select safe land by themselves as revealed through the discussion with an NRA settlement officer. Following the advice of the NRA, landowners relocated to a safer location identified by themselves. The documentary evidence showed that the relocation progress reached 73.3% by July 2021(National Reconstruction Authority, 2021).

Jackson et al. (2016), in their report entitled *Ensuring Equality in Land Rights and Reconstruction in Nepal*, also suggest that it was not only houses that were required but also suitable agricultural land for farming in proximity to the new settlement areas:

> The Government of Nepal and its development partners, including the World Bank, should ensure that resettlement policies and plans are integrated with agricultural land plans, including in the Land Use Bill. Resettlement sites should be co-located with suitable agricultural land. (Jackson et al., 2016, P. 4)

The willingness of people to resettle in new resettlement areas was evident in the flood hazard areas in the city of Kathmandu. In this case, the government constructed low-cost houses to shift approximately 230 households from the centre of Kathmandu Valley to the planned residential areas of Ichangunarayan Municipality, approximately seven kilometres from their existing dwellings.

The reason for the rejection of the newly built resettlement areas by the slum dwellers was that it was too far from the area where they had access to jobs and other social infrastructure. Although the distance to the new location was only seven kilometres from where they had lived, it still created resistance, as specified in the report published by the Asian Development Bank (Faust et al., 2020, P. 41):

> Evicted squatters claim they were consulted only after the buildings were constructed, and raised several reasons for rejecting the resettlement site: the long distance from their work in the city centre and the lack of public transportation, the lack of schools, the additional expenses of apartment living such as utilities …

6.3.4. Summary of Changes in the Land Market Across the Social Dimension

Based on the documentary evidence and archival records relating to the changes in the land market discussed in previous sections, the following changes were seen in the Nepalese land market across the social dimension (Table 6-4).

Table 6-4: Changes across the social dimension shown by records

Impact factors	Changes identified in the land market
Awareness	Conflict erupted over the advance payment for land purchase. The number of court cases over the return of the advance payment increased from 15 to 315 in Kathmandu, 9 to 144 in Lalitpur and 15 to 124 in Bhaktapur districts.
	Land disputes increased, as did in the number of court disputes about joint ownership. In the first year of the introduction of land use regulation, land disputes increased slightly, while in the second year, court cases relating to joint ownership of land increased from 104 to 1947in Kathmandu, 61 to 545 in Lalitpur, and 30 to 632 in Bhaktapur districts.
Expectation	Subdivision of land through family inheritance increased from 357 to 1147 in Kathmandu, 220 to 623 in Lalitpur and 197 to 783 in Bhaktapur district.
	Parcel subdivisions increased through divorce cases from 1345 to1794 in Kathmandu, 290 to 623 Lalitpur, and 114 to 167in Bhaktapur after the introduction of subdivision restrictions. Parcel subdivisions through divorce further increased in the following fiscal year 2018–2019.
Proximity	Around 50% of dwellers living in landslide hazard areas rejected relocation plans. Resettlement units at about 7 km distance offered to the people living in flood hazard areas were rejected by them as the distance from where were currently living to the new location was too far. When government advised them to select safe land by themselves, the relocation progressed to 73%.

6.4. Environmental Dimension

The goal of Nepal's *Land Use Policy 2015* is to achieve sustainable economic, social and environmental development through the optimum use of land in the country (Government of Nepal, 2015b). To explore the implications of the land use regulation for the land market across the environmental dimension, strategies specified in the land use policy were reviewed, and their implementation and corresponding changes in the land market were explored across the existing documents, data and records.

Article 1 of the *Land Use Policy 2015* clarifies the need of delineating risk zones in land use map to aware land users of various hazard including floods and landslide. Article 10(5) of the Policy mandates the adoption of flood risk control. Article 9(5) directs the execution of the Land Development Programme that would utilise unused land. Article 1 of the policy requires the classification of land into different categories to address the need for it to be used for various purposes. These issues and the impact associated with them are discussed below.

6.4.1. Risk Reduction

The Department of Water Induced Disaster Prevention (DWIDP) Nepal conducted a flood simulation study to identity flood risk in the Kathmandu Valley. Following the study, flood control works were undertaken in various parts of the Kathmandu Valley to mitigate this risk.

Performing a GIS overlay analysis of the flood model and a land use map prepared by the KVDA in 2016 revealed areas under various land use categories that could potentially be inundated by a flood of a 50-year return period unless mitigated by the flood control works (Figure 6-16).

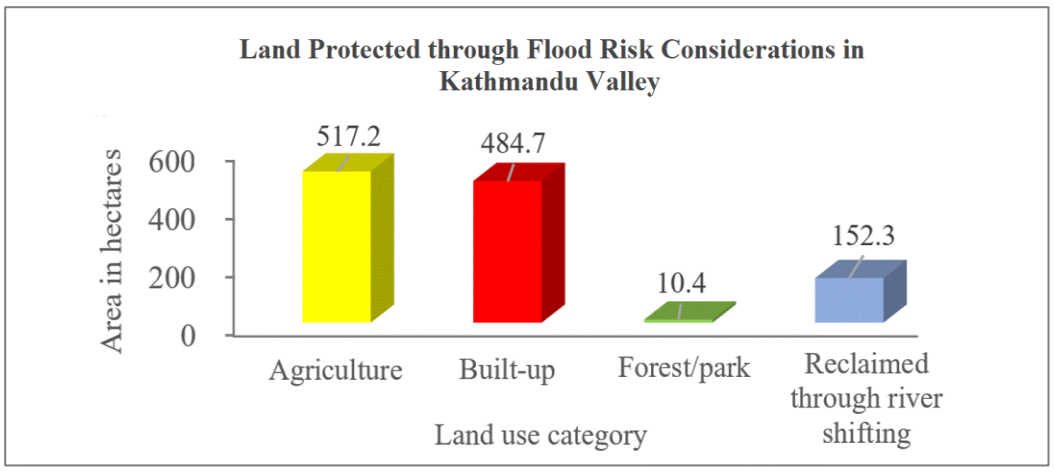


Figure 6-16: Flood-protected and reclaimed areas in Kathmandu Valley

The outcome of the flood risk reduction was the protection of 517.2 hectares of agricultural land and 484.7 hectares of residential land in Kathmandu Valley. While these protection measures were put in place, 152.3 hectares of land were also identified that fell within the river zone as a result of changes in the river's natural course over time.

The overlay analysis of the cadastral boundary of the Kathmandu Metropolitan Area and the flood prediction model also identified that approximately 20,000 cadastral parcels would have been exposed to flood risk if there were no flood mitigation measures in place along the riverbanks in the Kathmandu Valley (Figure 6-17).

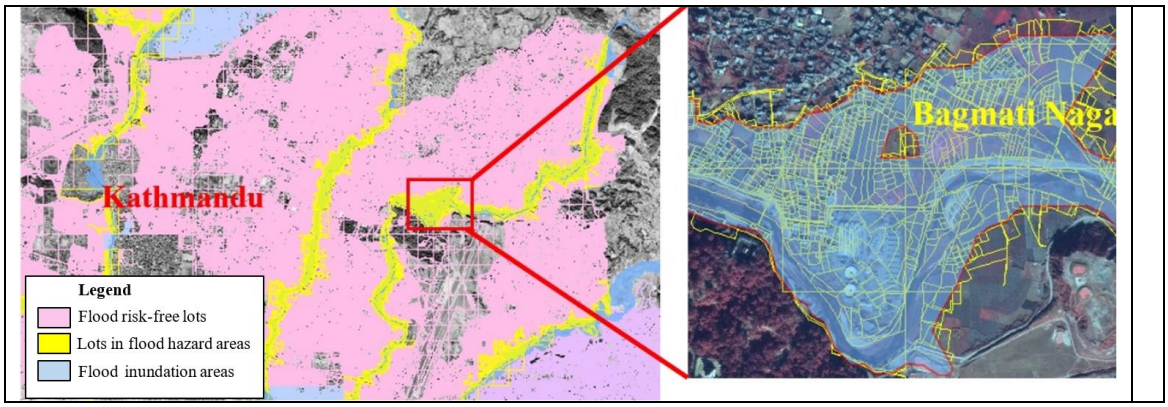


Figure 6-17: Flood-protected parcels (in yellow) in Kathmandu Metropolitan Area

Data Source: Flood Model- Department of Water Induced Disaster and Prevention 2009; Background Image: Google Earth- 2003 (left), 2020 (right)

Following the risk mitigation measures, local town development committees executed land development projects to provide residential land at various locations near the banks of the Bagmati, Manohara and Vishnumati rivers in the Kathmandu Valley. An image of the flood-prone areas near the Manohara River before and after flood protection measures is shown in Figure 6-18 below.

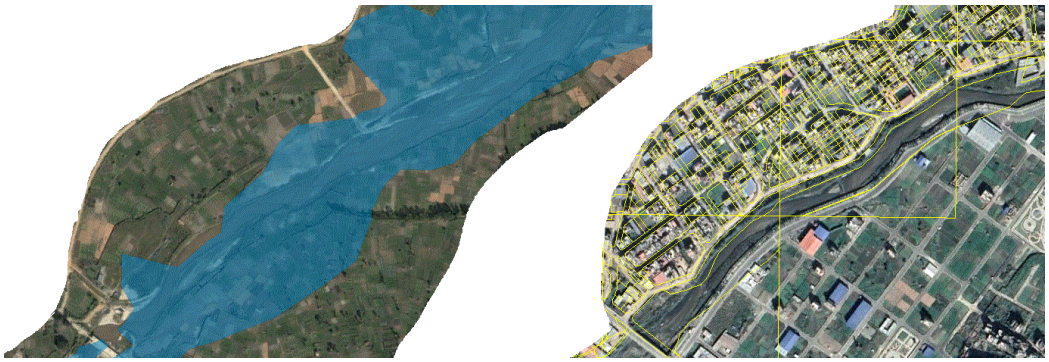


Figure 6-18: Land development area before and after the flood control

To the left of the river is the Sinamangal Land Development Area in Kathmandu and to the right of the river is the Dibyeshwori Land Development Area in Bhaktapur, which were developed after the flood control works.

Data Source: Flood Model- Department of Water Induced Disaster and Prevention (2009); Background Image: Google Earth- 2003 (left), 2020 (right)

River training works carried out in the Kathmandu Valley reduced the flood risk and enhanced the environmental value of the land. Land pooling projects implemented at various locations after the protection works along the riverbanks supplied developed land parcels to the land market (Table 6-5). The value of developed land also increased more than the surrounding unplanned and flood-prone areas.

Table 6-5: Land development projects near the major rivers in Kathmandu Valley

Project	Controlled river	Project area (ha)	Number of developed plots	Institution
Bagmati Phant - I (Corridor)	Bagmati	10.0	560	KVTDC
Naya Bazar	Vishnumati	42.7	2320	KMC
Chabahill Gopikrishna	Dhobikhola	10.2	259	KVTDC
Bagmati Nagar	Bagmati	63.4	2800	KVTDC, KMC
Chamati	Vishnumati	73.3	3170	KMC
Manohara Phant	Manohara	90.3	2100	KMC
Dibyeswori	Manohara	28.1	588	KVDA, KMC
Bagmati Phant-II (Shankhamul)	Bagmati	7.1	NA	KVDA, LMC

Source: DUDBC, 2018

Landslide Risk and Impact on the Land Market

GIS-based slope analysis was performed to explore the landslide risk in the Kathmandu Valley. Slope data was derived using the Open Sourced Digital Terrain Model of 30-metre spatial resolution acquired online provided by Shuttle Radar Topography Mission (SRTM). The Slope Analysis revealed that most of the topographic area of the Kathmandu Valley lies within a slope below 5 degrees. The second-highest geographical coverage was found to be covered by a slope of 5-15 degrees.

The overlay analysis of slope data and the land use map of 2016 shows that most of the built-up and agricultural land of Kathmandu Valley falls on an area with a slope less than 5 degrees (Figure 6-19). Most of the high slope (> 30 degrees) areas are covered by forest. Shrubland were found to cover a tiny portion of the area with the highest share in high slope areas. However, there is a significant percentatge of agricultural land in areas with slopes between 5 and 15 degrees. The Risk Sensitive Land Use Plan of Kathmandu Valley prohibits the use of land for residential purposes in areas with slopes greater than 30 degrees. The enforced classification system of 2017 does not allow commercial developers to use the agricultural land for residential area development purposes. With this rule enforced, approximately 66% of agricultual land with a slope above 5 degrees is excluded and thus contributes to safety from landslide hazards.

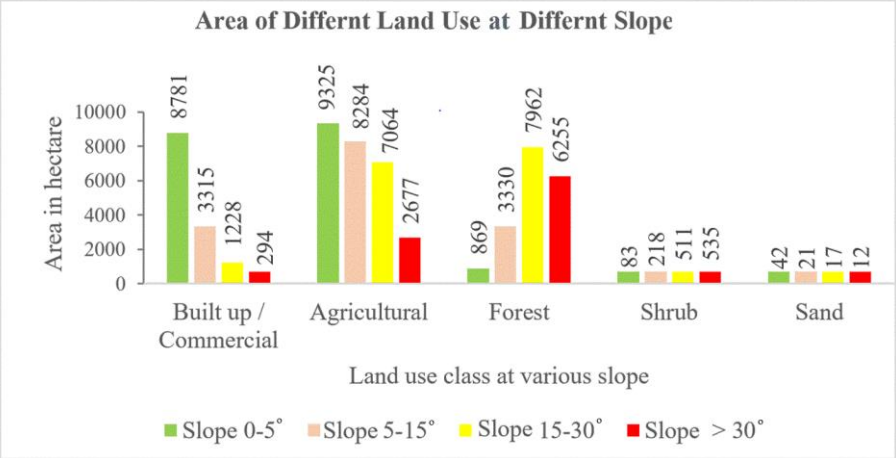


Figure 6-19: Area of different land use categories at different slopes

Data Source: GIID, 2018

6.4.2. Quality of Residential Land

Article 8.3 of the *National Land Use Policy 2012* specifies the execution of land consolidation (land pooling) as an approach to controlling haphazard land fragmentation and town-planning. The policy also endorsed the Land Development Programme directed by the *Town Development Act 1988* and the *National Urban Policy 2007*. Several land development projects were executed under these legal frameworks, which enhanced the quality of the residential land compared to the surrounding unplanned areas in the Kathmandu Valley.

Data collected from the Kathmandu Valley Development Authority identified 71 registered housing projects, 47 apartment projects and 30 private land development projects completed by the private land and housing developers. In the period after the introduction of the land use policy in 2012 to the enforcement of subdivision restrictions in 2017, the private sectors developed 29 registered housing projects, 12 apartment projects and 17 private land development projects. After the enforcement of subdivision restrictions in 2017, there were only six registered housing projects, two apartment projects and three private land development projects established.

Data from the Ministry of Urban Development (MOUD) showed that the average open space available in the Kathmandu Metropolitan City occupied only 0.5% of the total urban area. The value is very low compared to the average 5% covered by open space and 20% covered by road zones in land pooling areas. Regularised plots further

contributed to the open space in land pooling areas compared to surrounding unplanned sites of similar size.

Unplanned urban areas in the Kathmandu Valley are generally characterised by improvised construction, narrow winding roads, poorly designed structures, lack of proper drainage and limited open space. The KVDA developed the Risk Sensitive Land Use Plan (RSLUP) under the guidance of the *National Land Use Policy 2012* to improve the poor land use condition in the Kathmandu Valley (Kathmandu Valley Development Authority, 2015b). The plan requires that the readjustment projects implemented by the KVDA contribute to better residential environments featuring enhanced road accessibility, open space and other essential infrastructure. Therefore, land management tools like land pooling were considered successful in the Kathmandu Valley by enhancing the quality of residential land and increasing land value. The RSLUP prepared by the Kathmandu Valley Development Authority (2015b, P. 22) specifies that '… land pooling has been very successful in the context of Nepal, especially Kathmandu Valley. Large areas of land have been acquired and redistributed in a planned manner …'.

Despite the fact that the *National Land Use Policy 2012* promotes quality land development projects in the valley, the number of the land development projects supplying quality land decreased after the introduction of the land use policy. It was further reduced after the subdivision restriction in the Kathmandu Valley. Data shows that the land pooling project established before the introduction of the *National Land Use Policy 2012* contributed 30 hectares of open space through 24 land pooling projects. Total open space including street space was 179 hectares in a total developed land area of approximately 685 hectares. After the *National Land Use Policy 2012* came into place, only four projects were commenced between 2012 and 2017, and three were initiated between 2017 and 2021. With the number of projects reduced, there was a reduction in the supply of quality land plots and therefore in the volume of open space.

6.4.3. Suitability of Zoning Classification

The previous section discussed KVDA's efforts to supply a better quality of residential land in the Kathmandu Valley. However, improving the land use situation through land

readjustment or consolidation was not sufficient to supply land for residential purposes within the Kathmandu Valley. Not only was the supply of value-added residential plots insufficient for those who could afford to buy the land, but it was also unaffordable for the poor. The market situation provided an opportunity to supply comparatively cheaper and unplanned agricultural land in the land market together with the developed residential land (Upreti et al., 2017). Supply of land for residential purposes through the fragmentation of agricultural land drew the government's attention to the need to initiate the enforcement of subdivision restrictions on agricultural land, which have come into place since 2017. The government-enforced land classification identifies mostly agricultural land and does not match the existing land use pattern, a scheme entirely different from what is specified in the *National Land Use Policy* of 2012 and 2015 (Government of Nepal, 2017b). Article 8(1.1) of the *Land Use Policy 2015* specifies three basic criteria when classifying land into different use categories: (i) to consider the landform, capability and usability of land for a particular use; (ii) to allocate land in the same category in which it is being used as far as practicable; and (iii) to consider the need for land for a particular use. I explored the documentary evidence that would identify whether the land classification system introduced in Nepal applied these criteria appropriately to support the various dimensions of the land market.

I found that the land categorisation implemented in Nepal was almost entirely based on the classification system defined in 1964 (His Majesty's Government of Nepal, 1964). This system categorised most of the vacant land in the Kathmandu Valley as agricultural land. However, there was no consideration given to how the land was being used. Due to the absence of land use regulation and its enforcement, housing construction occurred haphazardly without effective planning of open space or infrastructure.

The enforcement of agriculture-based land classification affected the implementation of KVDA's *Risk Sensitive Land Use Plan 2015*. The plan had identified constraint-free land that could be used for residential development. The constraint-free residential area was outside the designated areas of open space and other protected or constrained areas. The area also excluded land with a slope greater than 30 degrees, flood-prone areas and areas at high risk of earthquakes (Kathmandu Valley Development

Authority, 2015b). However, the new classification system did not recognise the proposed area for residential development, causing a decline in available land for residential development in the Kathmandu Valley. The constraint-free land available for each household (four persons) for residential use in the Kathmandu Valley is shown in Figure 6-20.

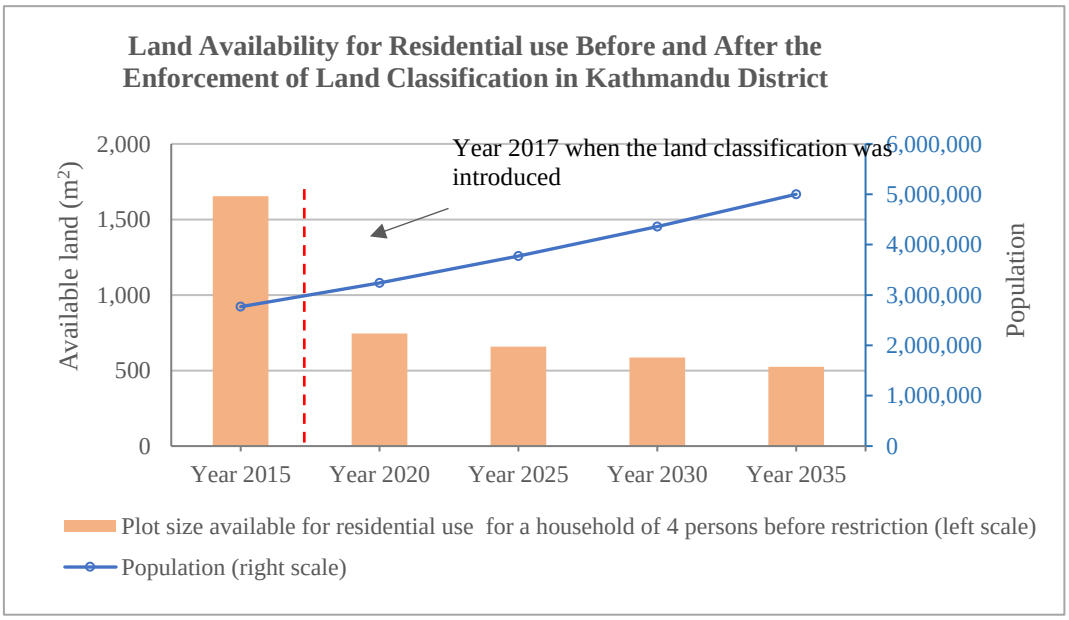


Figure 6-20: Availability of land for residential use per household before and after the enforcement of land classification in the Kathmandu Valley

Data source: KVDA 2015, 2020 (population data beyond 2020 are projected data)

A decline in land transactions in districts across the Kathmandu Valley also indicates a reduction in land supply in the land market.

Enforcement of agriculture-based land classification and subdivision restrictions caused a reduction in land available for residential purposes in the Kathmandu Valley. Land development projects were not sanctioned for commercial land development. Small landholders who had purchased agricultural land for residential purposes were doubtful that the restriction would go beyond affecting subdivisions and would not even allow for housing construction. On the other hand, municipalities were having difficulty addressing the problem of land scarcity for residential housing. With the rising problem of land scarcity, municipalities granted approvals for housing construction. The number of housing constructions for individual use was found to increase sharply despite a reduction in the land transaction volume in Kathmandu Valley (Figure 6-21).

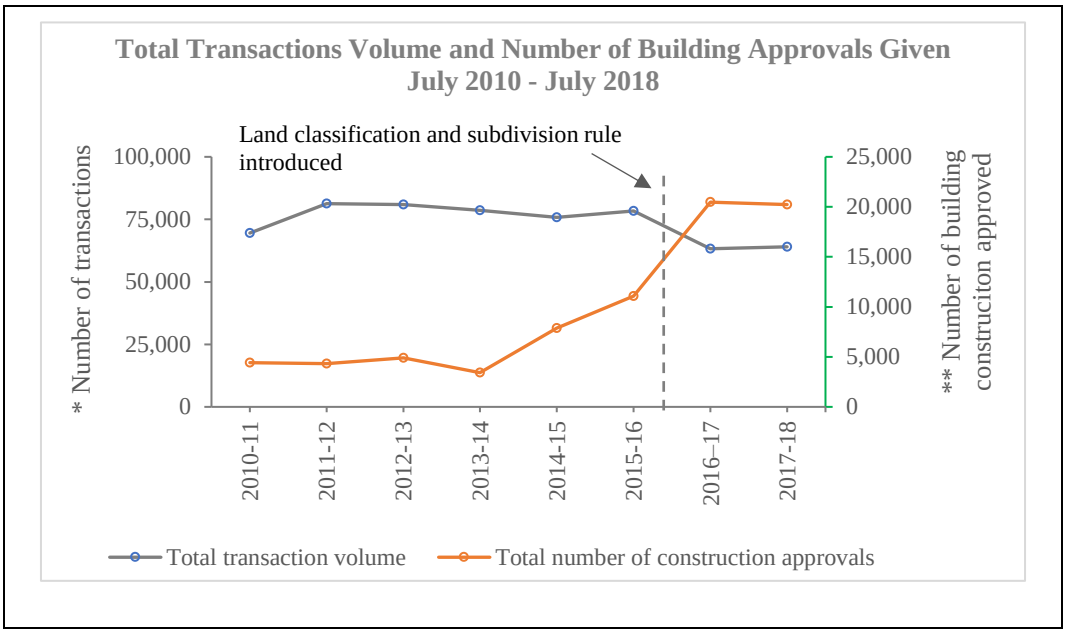


Figure 6-21: Transaction volumes and, the number of building construction approvals

Data sources: *Department of Land Management and Archive 2018.

**Economic Activity reports, Nepal Rastra Bank 2011-2018

The haphazard housing construction triggered by unsuitable land classification has contributed to environmental concerns in the Kathmandu Valley. The subdivisional restriction and land categorisation were intended to control the ad hoc use of land. However, due to the limited supply of new residential land and unsuitable zoning, there was encroachment into the agricultural land. The Commission for the Investigation of Abuse of Authority reflected thus on this situation:

> As the Parcel-based Land Zoning of the most of the area has been almost completed across the country, and the *Land Use Act 2019* has already been introduced to achieve a sustainable development that classifies land to allow its optimum use, it is impracticable and unscientific to enforce subdivision restriction based on the classification system established decades ago ... (Commission for the Investigation of Abuse of Authority, 2020)

6.4.4. Summary of Changes in the Land Market Across the Environmental Dimension

Based on the documentary evidence and archival records relating to the changes in the land market discussed in previous sections, the following changes were seen in the Nepalese land market across the environmental dimension (Table 6-6).

Table 6-6: Changes across the environmental dimension shown by records

Impact factors	Changes identified in the land market across the environmental dimension
Risk Reduction	Flood risk reduction protected 517.2 ha of agricultural land and 484.7 ha of residential land in Kathmandu Valley; 152.3 ha of land was recovered from the river territory.
	20,206 parcels were protected from flood hazards. 11,797 flood-risk-reduced residential plots were supplied to the land market.
	No remarkable contribution was found in the land market through landslide risk reduction.
Quality of Residential Land	Changes in the percentage of open space from the average of 0.5% in the Kathmandu Metropolitan City to the four percent plus average 20% of land for streets in land development areas. After *National Land Use Polic*y 2012, with the number of projects reduced, there was a decrease in the availability of open space.
	Before *National Land Use Policy 2012*, the private sectors developed 71 registered housing projects, 47 apartment projects and 30 private land development projects. After the introduction of *National Land Use Policy 2012* to the enforcement of subdivision restriction in 2017, the private sector developed 29 registered housing projects,12 apartment projects and 17 private land development projects. Government sectors initiated 4 land development projects. After the enforcement of subdivision restriction in 2017, the private sector developed six registered housing projects, two apartment projects and three private land development projects. Government sectors initiated three land development projects.
Suitability of Zoning Classification	An increase in housing approval given by municipalities led to haphazard use of land. Housing approvals increased from 3726 to 8883 in Kathmandu, 3499 to 4878 in Lalitpur, and 3847 to 6709 in Bhaktapur, despite decreased transaction volume in Kathmandu Valley.
	Areas for residential development were not allocated by the enforced land regulation. Availability of residential land for a household decreased from 167 m^2 to 86 m^2, in the Kathmandu Valley, 774 m^2 to 424 m^2 in Lalitpur and 507 m^2 to 235 m^2 in Bhaktapur. In Kathmandu Valley, total reduction was from 1654.8 to 746.0 m^2.

6.5. Institutional Dimension

Secondary data and documentary evidence regarding the impact on the land market across the institutional dimension can be seen in a number of areas and are discussed in the following sections.

6.5.1. Subdivision Restrictions

Impact of subdivision restrictions across the institutional dimensions were reduction in land availability, problems in selling developed land plots, impact on the ease of use of land. They are discussed in the following subsections.

6.5.1.1. Reduction in Land Availability through Subdivision

Subdivision restrictions on agricultural land created a shortage of land suitable for residential purposes. The restrictions were based on the original Land Classification

Scheme, which designated land as largely agricultural through the *Land (Survey and Measurement) Act 1964*.

According to the scheme, two distinct types of land were found in the Kathmandu Valley: areas covering new and updated cadastral maps and areas being administered with old cadastral maps. In areas where the cadastral map had not been updated through resurveying, all vacant private lands were recorded as agricultural. The area covered by the updated cadastral maps was a smaller portion of the Kathmandu Valley that included two land categories: agricultural and residential/commercial. It was found that approximately 75% of the Kathmandu Valley required cadastral updates (as of August 2021) and, therefore, the classification was also in need of update, despite changes which had occurred in the preceding decades (Figure 6-22).

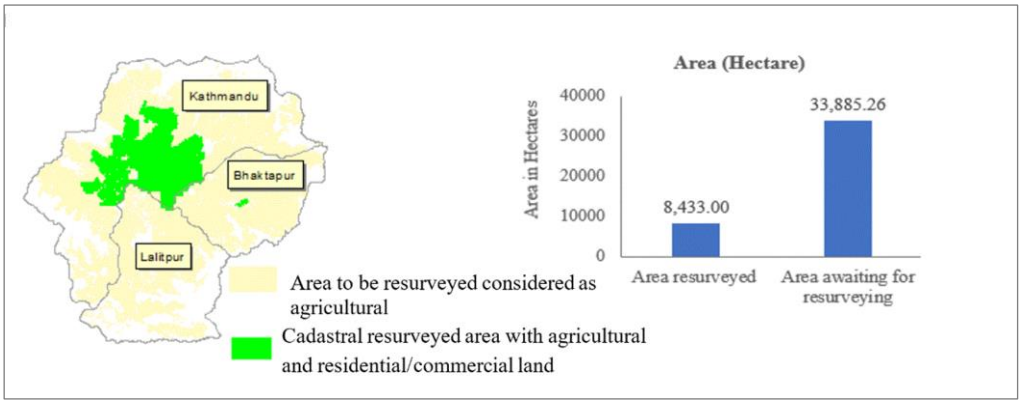


Figure 6-22: Area in Kathmandu Valley having land classification based on *Land (Survey and Measurement) Act 1963*

(Land classified under the old system is marked yellow; land classified under the partially updated land cadastral system is marked green.) Data source: Survey Department, 2019

As specified by the decree issued by the then Ministry of Land Reform and Management in 2017, a lot could not be subdivided more than once in a year. The restriction aimed at reducing the rate of land fragmentation as shown by the reduction in the number of subdivisions that occurred before and after the introduction of land use regulation in the land market (Figure 6-23).

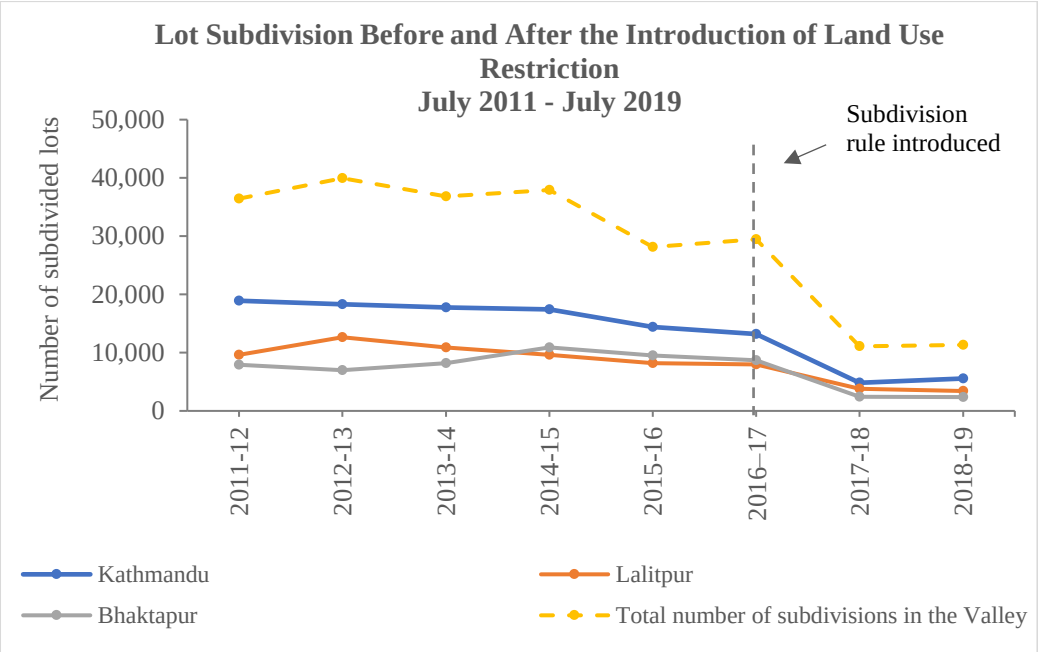


Figure 6-23: Number of lots subdivided before and after the subdivision restriction

*Survey Department, 2019

The land value in Bhaktapur was lower than in Kathmandu and Lalitpur until 2012 (before the completion of the expanded Araniko Highway connecting Bhaktapur and Kathmandu). Demand then increased in Bhaktapur District, resulting in more subdivisions in Bhaktapur until 2014–15. However, the major earthquake in 2015 contributed to reducing the number of transactions in all three districts. The introduction of subdivision restrictions in 2016–17 further limited land supply. The reductions in the number of subdivisions affected the accessibility of land as individual buyers could not buy it due to the enforced restrictions.

6.5.1.2. Problems in Selling Developed Land Plots

Because of the subdivision restrictions introduced in 2017, the KVDA ceased to approve plans submitted by private land developers who had already invested in land specifically for development purposes. Those who had acquired a licence for a development project but had not completed the project could not sell the developed lots as specified in the decree issued by the MOLRM. Land Revenue and Survey Offices were directed not to approve privately subdivided lots on agricultural land (Government of Nepal, 2017b). The impact on the availability of residential land for development was seen through the reduction in the number of formal land

development projects, as shown in Table 6-7. Project approval by the KVDA reached zero after the subdivision restriction (2017–2019).

Table 6-7: Changes in housing and land development projects in Kathmandu Valley

Development type	up to 2017	2017–2019
Registered private housing project	100	16
Private apartment project	59	2
Land pooling (local government)	23	0
Private land development	47	5

Data source: DUDBC, 2018; KVDA 2019

6.5.1.3. Impact on the Ease of Use of Land

The limitation of being allowed to subdivide a land parcel only once in any year affected many landowners willing to purchase adjoining land to enable road access. Landowners therefore had to wait until the next fiscal year to acquire a piece of land through the subdivision, which caused back-logs to accumulate in the survey offices. This restriction created problems for both access to and ease of use of the land (Figure 6-24).

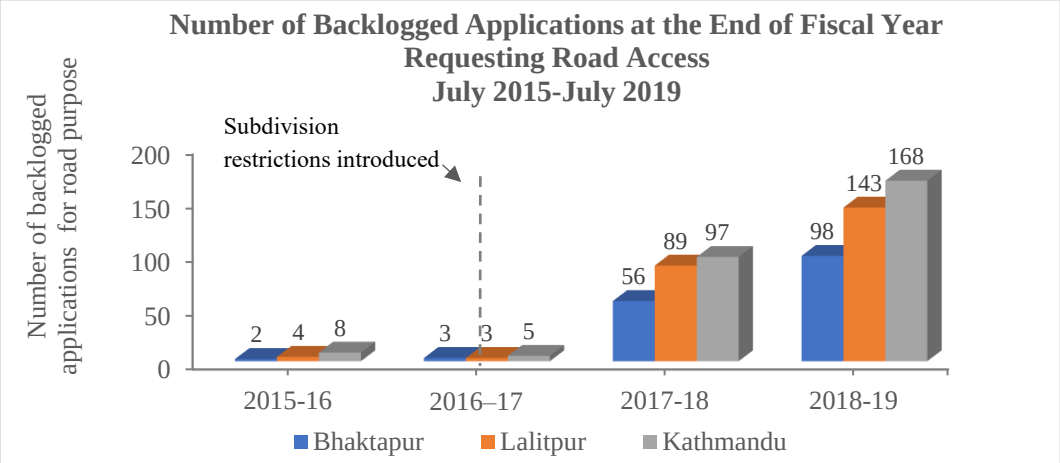


Figure 6-24: Backlogged applications submitted to Survey Office for road access

Data source: Survey Offices of Kathmandu (Dillibazar, Kalanki, Chabahill), Lalitpur and Bhaktapur, 2018

Private land developers considered the restrictions to be a violation of their fundamental rights to property and filed a court case against the land use restrictions. However, the court ruled that the government's decision was in the public interest and upheld the land use regulations.

Nonetheless, the Commission for the Investigation of the Abuse of Authority recommended that the government review the land use restrictions:

> It has been observed that hundreds of millions of dollars invested by licensed individuals, organisations or companies for land development purpose have been forced to remain idle due to the enforced land use restriction, and has caused a negative impact on financial liquidity across the country (Commission for the Investigation of Abuse of Authority, 2020, p. 1).

6.5.2. Lot Size Control

In 2017, the KVDA introduced a threshold lot size of 8 Ana (254.32 m^2) within the New Town Development Area of the Kathmandu Valley. Therefore, a land parcel smaller than one Ropani (508.64 m^2) could not be subdivided because this would result in a parcel smaller than the threshold size. However, approximately 80% of parcels in the project area were found to be less than 508.74 m^2 in size, which implied that 80% of the land parcels in the area could not be subdivided (Figures 6-25 and 6-26); this further limited the supply of land to the land market.

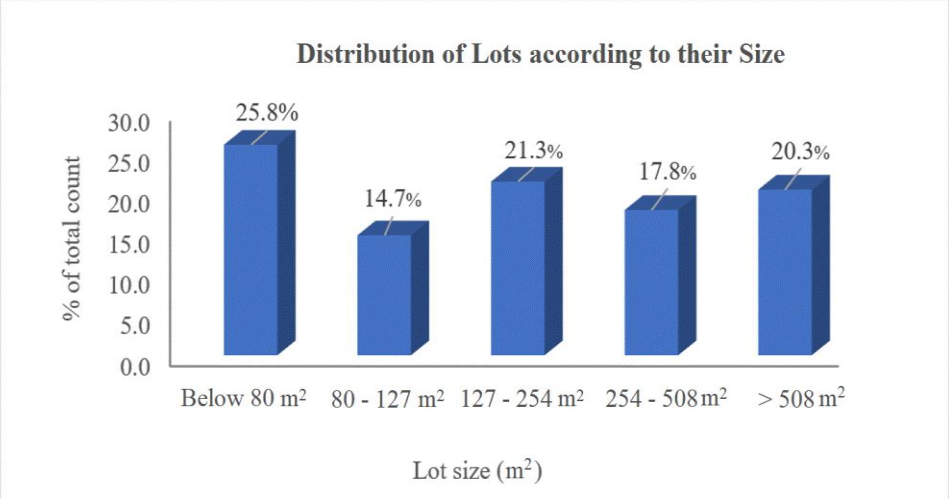


Figure 6-25: Percentage distribution of land parcels in new town development area

Data Source: Survey Department, 2018

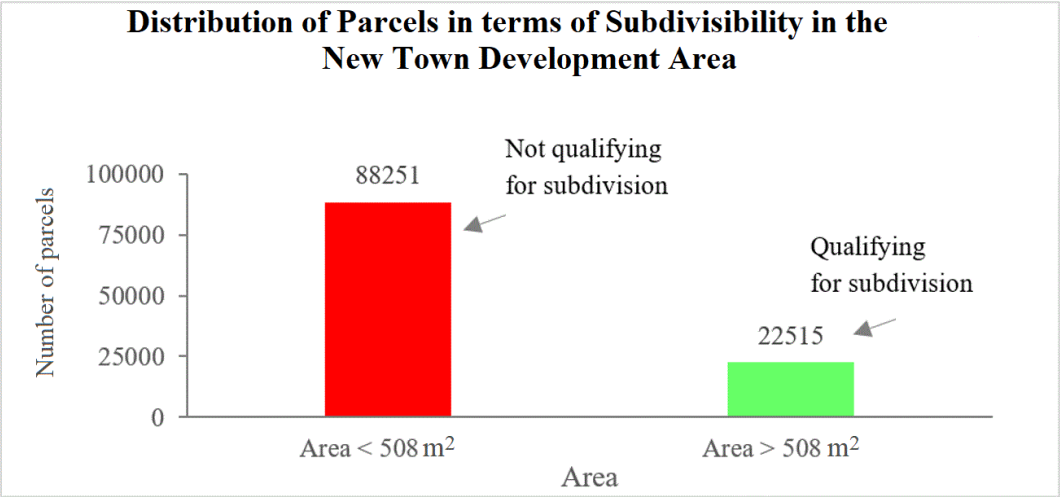


Figure 6-26: Qualifying and non-qualifying parcels for a subdivision

Data Source: Kathmandu Valley Development Authority, 2018

6.5.3. Lack of Coordination

The *National Land Use Policy 2012* identified the need for a coordinated organisational framework to facilitate its implementation. However, there was no coordination mechanism established to ensure a smooth transition and facilitate the sharing of land use information amongst the stakeholders. The lack of coordination resulted in significant delays, poor decision making and potential financial hardship.

A key example of this was that the digital cadastral maps held by the Survey Office and the road zone expansion plan executed by the KVDA were compiled separately and their cadastral boundaries did not match. As there was no coordination, the KVDA did not share the road expansion plan with the Survey Offices of Kathmandu Valley; consequently, Survey Offices and landowners were not aware of the updated road and cadastral boundaries. Landowners were therefore unaware that roads intercepted their property and so they continued using their land as per the cadastral records (Figure 6-27).

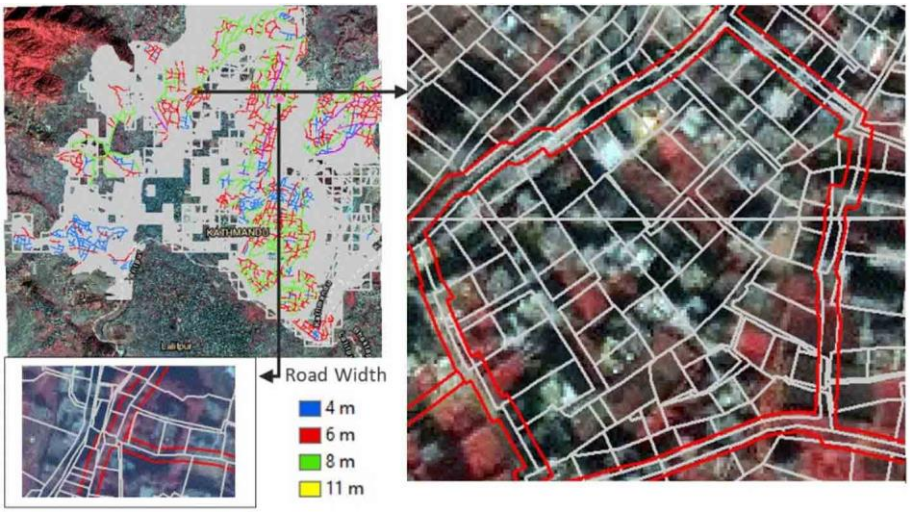


Figure 6-27: Overlay of road expansion plan and cadastral map of KMC (top left).

Zoomed insets (right and bottom left): Enlarged view of parts of the overlay (in red – 6 m Road Plan of the KVDA; in white – cadastral boundary used by the landowners)

Data sources: Cadastral boundary – Survey Department, 2018; Road boundary – KVDA, 2018

Statistics regarding the landowners affected by the road expansion could not be acquired through the KVDA due to the lack of consolidated records at the KVDA central office. However, an overlay analysis of the road plan with the cadastral boundary in a GIS environment showed that many lots were impacted by proposed expanded road corridors of various widths (Figure 6-28).

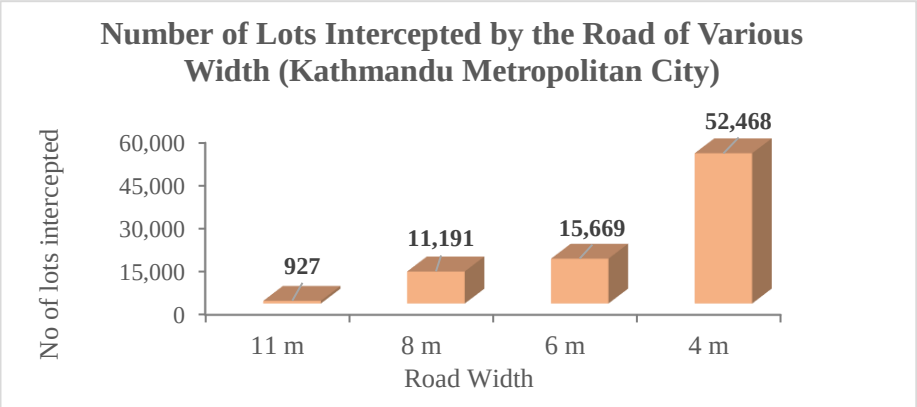


Figure 6-28: Number of lots intercepted by the road expansion in KMC

Data Source: Kathmandu Valley Development Authority, 2018.

Parcel information: SD, 2018

The number of lots affected by a road of 4 metres' width in the Kathmandu Metropolitan City was found to be 52,468. The 11-metre road width impacted 927 lots.

These counts provide an estimate of the number of landowners affected and are significant.

The road expansion program had been initiated by the Kathmandu Valley Town Development Committee (KVTDC) in 2011, a body of politically elected members within the Kathmandu Valley. However, the KVTDC did not proceed with the road expansion following public protest. The government then dissolved the KVTDC and established the KVDA as an independent authority in 2012 (Kathmandu Valley Development Authority, 2015a). The government also introduced the *National Land Use Policy 2012*, which authorised the government via the KVDA to undertake the road expansion. This resulted in numerous court cases regarding the violation of property rights across Kathmandu Valley (Figure 6-29).

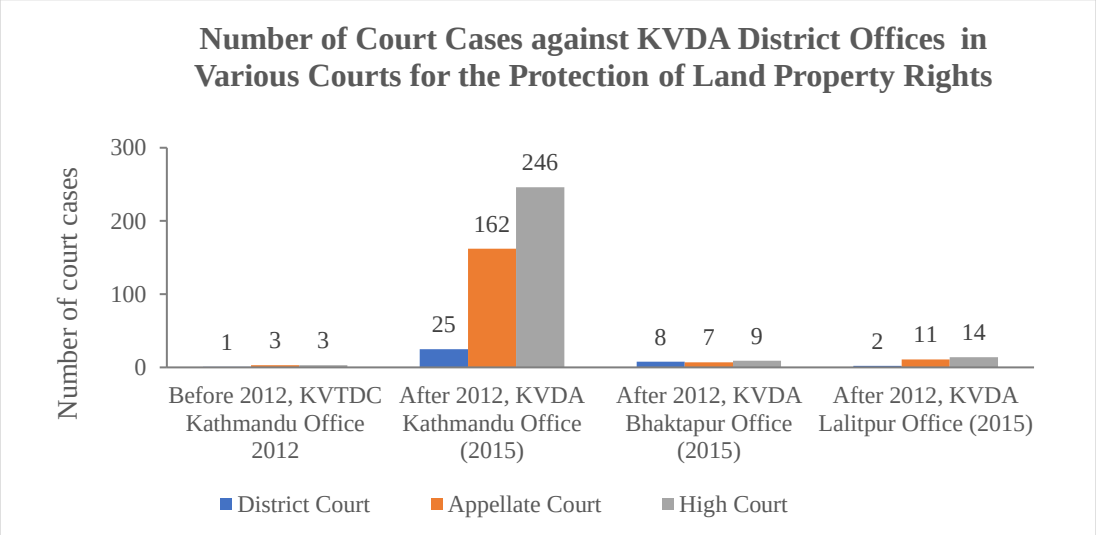


Figure 6-29: Number of court cases against KVDA

Source: KVDA, 2015

Records within the KVDA documented only seven court cases against the road expansion before the introduction of the *National Land Use Policy* in 2012 but significant increases after 2012 with the Kathmandu office receiving the majority of cases. Little progress in road expansion within the other districts resulted in fewer court cases against the KVDA.

Owing to the lack of coordination between the land use mapping body and the Land Revenue Office, the National Land Use Database could not be linked with the land records. As the Land Revenue Office remained unaware of the land use zoning data,

land classification was enforced using cadastral records that were incorrect and outdated.

6.5.4. Summary of Changes in the Land Market Across Institutional Dimension

Based on the documentary evidence and archival records relating to the changes in the land market discussed in previous sections, the following changes were seen in the Nepalese land market across the institutional dimension (Table 6-8).

Table 6-8: Changes across the institutional dimension shown by records

Impact factors	Changes identified in the land market
Subdivision Restrictions	Accessibility to land decreased due to a reduction in land availability, with 75 % of the land that could be used for residential purposes enforced as agricultural land. Total lot subdivision reduced by 0.38 times compared to the subdivision before the introduction of subdivision restrictions. Ease of use of land reduced due to inability to sell or buy the land. The number of backlogged applications for subdivision approval increased nearly 20 times in Bhaktapur, 30 times in Lalitpur and 55 times in Kathmandu.
Coordination	Court cases against property rights violation by the road expansion project increased from 97 to 168 in Kathmandu, 89 to 143 in Lalitpur and 3 to 56 in Bhaktapur from after the introduction of *National Land Use Policy 2012*. Total cases against the road expansion project were seven cases before 2012 but reached to 484 after KVDA accelerated expansion works in Kathmandu Valley.
Lot Size	There was an 80% reduction in the availability of land through subdivision because of a reduction in the availability of land of a standard lot size.

6.6. Chapter Summary

This chapter presented the impact of the introduction of land use regulation on the land market in Nepal based on the examination of the archival records and documentary evidence held by various agencies. Across the economic dimension, there were changes in land valuation and an increasing demand towards the smaller parcels. A negative correlation was observed between the price of the land and parcel size. The market saw reduced mortgage availability as shown by reduction in loan-to-value ratio, increasing non-performing loans, percentage decreases in loans received on a year-on-year basis, and a decrease in real estate landowners. Transfer tax and transaction costs increased. Many landowners could not receive compensation.

Across the social dimension, the study revealed an increase in conflict and court cases that tended to supply land in the Kathmandu Valley, despite the subdivision restriction. Across the environmental dimension, land pooling and residential housing projects

were found to decrease despite their positive contribution to the environment as they supplied land with increased open space and better-quality infrastructure. Flood-risk reductions supplied risk-reduced plots in the valley; however, the land classification was not sufficient, resulting in haphazard housing construction in unplanned areas. Across the institutional dimension, it was found that subdivision restrictions and lot size reduced land availability, resulting in fewer people having access to land, as shown by the reduction in transaction volume and availability of qualifying parcels for subdivision. Property rights violation cases increased due to poor coordination during the implementation of land use regulation.

This chapter partly provided the answer to the fourth research question and achieved the fourth research objective. The next chapter will present the synthesis of results presented in this chapter and the perspective-based impact presented in the chapter adopting the mixed methods.

Chapter 7: Synthesis and Discussion

7.1. Introduction

In Chapter Five, I discussed the results obtained from the survey and interviews on the impact of land use regulation on the land market. In Chapter Six, I presented the results, based on the documentary evidence collected from the study area, on the impact of land use regulation. The purpose of this chapter is to summarise and review the findings from Chapters Five and Six and synthesise them to explore how and why the impact variations occurred in the land market in Nepal across multiple dimensions. This chapter begins with a review of the findings of the previous chapters, Five and Six. The results are then synthesised by connecting and interpreting the findings using an exploratory mixed-methods research design framework, as discussed in Chapter Four. Finally, the overall results are discussed to explain how the findings support the theory of 'non-generalisability' of a land market.

7.2. Review of Findings

7.2.1. Review of Stakeholders' Perspectives: Impact of Land Use Regulation on the Land Market

Chapter Five adopted a new approach of measuring the impact of land use regulation on the land market that was identified through the review of theories addressing the land use-land market relationship, land market measurement practices, and land market impact factors refined through the interviews. The approach incorporated the stakeholders' perspectives that were collected through the survey questionnaire and analysed in AHP.

In the first phase of the perspective-based impact findings, qualitative analysis of the interview data was performed. The interview data was transcribed, codified and analysed for recurrence of codes. Cluster of recurring codes across each dimension were visualised. Impact issues raised in the interview as well as the key message from the interview were identified. The impact factors that were initially identified through the literature review were refined by comparing with the information collected through

the interview with stakeholders. The second phase of the perspective-based study performed the analysis of the survey data. The survey data included the qualitative perception of information into quantitative terms— positive and negative scores and were analysed through AHP to identify the aggregated stakeholders' perceptions of the degree and direction of impact on the land market.

The interview data revealed that the Nepalese land market was impacted through various factors across multiple dimensions. Valuation, mortgage availability, transaction costs, taxation and compensation were identified across the economic dimension; awareness, expectations and proximity were identified across the social dimension; quality of residential land, suitability of zoning classification, and risk reduction were identified across the environmental dimension; and coordination, subdivision restriction, and lot size control were identified across the institutional dimension.

This study revealed that Nepalese stakeholders did not rate the various impact factors at the same level of importance as they assigned differing weights to the impact factors. It was also identified that the impact was not uniform across the different dimensions. The Spearman's correlation coefficient between the weight of impact factors and corresponding impact score was −0.002 (Appendix 9). This indicates that the stakeholders' perceptions of the land market outcome were not affected by the impact factors' importance or weight, but by the way in which the land market outcomes influenced them.

Analysis of the impact results were conducted separately for the private sector, banks and other financial institutions, and implementation authorities revealed that perspectives-based impact outcomes varied according to the stakeholders' role in the land market (Figure 7-1). This variation is reflected in the impact results across all dimensions. The private sector registered the highest negative impact across the economic dimension, whereas the implementing authorities scored the lowest negative impact across the same dimension. This trend was similar across the other dimensions.

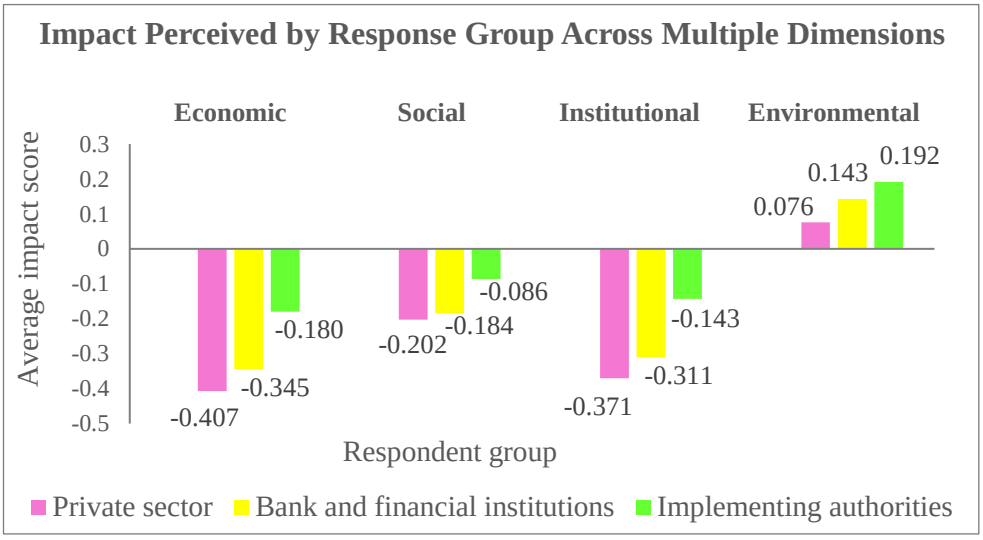


Figure 7-1: Variation in impact results across the respondent group

The stakeholders from the private sector, such as landowners and land developers, were impacted by the restrictive provisions of the land use regulation. They considered the land use regulation to be a challenge to their perceived property rights that would impact them negatively. This perception was registered most strongly in the economic and institutional dimensions. However, there was a slightly positive impact registered across the environmental dimension. On the other hand, the implementing agencies need to ensure environmental, social and economic benefits to society at large. As the private sector generally tends to resist restrictive land use regulation, not surprisingly, the impact here was perceived as more negative. Whereas implementing agencies are often also the regulating body and therefore try to support and justify the implementation, the financial sector operates through government policies and regulation and serves all members of the community. This sector views the impact level somewhere between what is perceived by the implementing authorities and the private sector. Although there was variation in the perception of the level of impact across various groups of stakeholders, the study revealed that the direction and the trend of the impact scored by the different groups was generally consistent across all dimensions.

The average score of the impact across each dimension as perceived by each participant group shows that the Nepalese land market was affected negatively across the economic, social and institutional dimensions, whereas it was affected positively

across the environmental dimension. The following subsections discuss the impact across each dimension.

7.2.1.1. Economic Dimension

Stakeholders perceived that the implementation of land use regulation in Nepal weakened their financial or economic strength in the land market. They perceived that the negative impact was often associated with their inability to subdivide land, and a lack of compensation for their land acquired by Kathmandu Valley Development Authority (KVDA) for road expansion; increased transaction costs, reduced mortgage availability, increased price of residential land, and increased taxation following the land use restriction were also identified.

7.2.1.2. Social Dimension

Across the social dimension, the impact assessment showed that land use regulation did not fulfil the stakeholders' social expectations. The adopted strategies compelled landowners to request court orders for subdivision. Stakeholders expected a simple and efficient procedure for subdivision. Being unaware of the subdivision restrictions, buyers who had made an advanced payment sought court orders to have their deposit returned after they became aware that they could not acquire the land due to the subdivision restriction. There were also disputes between clients and staff of the Land Revenue and Survey Offices as a result of the failed transactions. Due to their lack of awareness, stakeholders continued to invest in reclassified land, which led to further disputes with the KVDA during the execution of the Guided Land Development Program.

7.2.1.3. Environmental Dimension

The positive impact across the environmental dimension is attributed to two factors: reduced risk exposure and the perception of improved quality of residential land. Improved road corridor planning and expansion lessened traffic congestion on many of the roads in the Kathmandu Valley. The identification of flood zones along major rivers of Kathmandu Valley and flood mitigation measures contributed to improved environmental outcomes and the supply of safe residential plots in flood-protected

areas. Similarly, land use planning associated with physical development supplied value-added residential plots in the land pooling project areas of Kathmandu Valley.

7.2.1.4. Institutional Dimension

The negative impact across the institutional dimension is attributed to the poor implementation approach and limited implementation strategies adopted in Nepal, resulting in insecurity of property rights. Poor coordination between the Survey Office and other implementing agencies resulted in the lack of sharing of existing land information held by both parties. Landowners used the land information provided by the Survey Office for housing and other structures. However, the road zone expansion plan prepared by the KVDA did not match the cadastral boundaries. Instead, landowners continued to utilise their land based on the cadastral information of the Survey Office, which was not approved by the KVDA. This resulted in landowners having to go to court to secure their property rights.

The subdivision limitations reduced the transaction volume, which made less land available on the market. Similarly, the control of lot size limited the availability of land; thus, potential buyers could not access the land due to subdivision and lot size control. These strategies did not allow stakeholders to sell or buy land as they needed to and, therefore, this prevented them from exercising their property rights. The subdivision restrictions encouraged buyers to undertake informal transactions outside of the formal land market environment. The overall average impact based on the stakeholders' perspectives is presented in Figure 7-2 below.

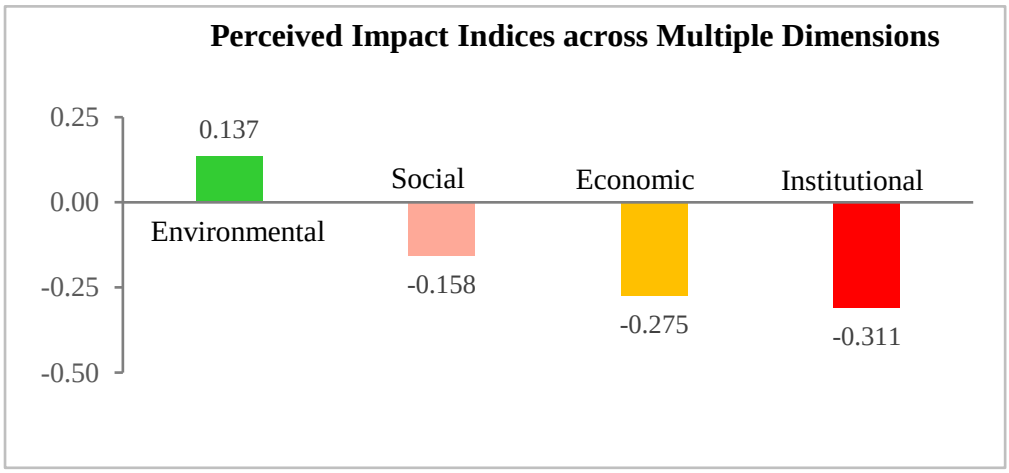


Figure 7-2: Perceived impact indices across multiple dimensions

As illustrated in Figure7-2, the impact index across the environmental dimension is positive, while those across other dimensions are negative. This result agrees with the findings that low-income countries such as Nepal prioritise environmental concerns over any other aspects related to sustainability (Rodríguez-Rosa et al., 2017, P. 560). The author further state:

> The results obtained with respect to the relation between low income countries and environmental concerns (air quality, biodiversity, renewable water resources, consumption, renewable energy and greenhouse gases) are in agreement with results obtained previously by Hosseini and Kaneko (2011), who found that "Africa has the worst standing relative to other regions for institutional, economic and social aspects; the only positive outcome belongs to the environmental aspect".

The national land use policy expects a balanced outcome for sustainable development. However, the stakeholders' perspectives across the environmental dimension on the one hand, and the amendment to the land use policy to mandate risk zones on the other hand, indicate Nepal's greater emphasis on environmental impacts than on social, economic, and institutional impacts. Although the environmental concerns specified by Rodríguez-Rosa et al. (2017) were not found to have addressed the issues considered in this study, risk reduction and implementation of land development projects together with other land use restrictions can be considered, at a broader level, as an effort to gain a positive outcome across the environmental dimension.

7.2.2. Review of Land Use Regulation Impacts on the Land Market based on Archival Records

This section reviews the land use regulation impacts on the land market based on documentary evidence and the data and records collected from various government agencies, as discussed in Chapter Six. The review sought to compare, complement and contrast the impacts measured through the stakeholders' perspectives across the economic, social, environmental and institutional dimensions.

7.2.2.1. Economic Dimension

The documentary evidence and archival data collected from the study area revealed various changes in the Nepalese land market across the economic dimension.

The reduction in the supply of residential land consequent to the subdivision restriction on lot size impacted land value in the Kathmandu Valley. The land price increased by 31% in the year following the enforcement of subdivision restrictions. There was no significant relative increase in population or migrant inflow to the valley during this time, as illustrated in Figure 3-2. The upward deflection of the land price can be attributed to the restrictive regulation enforced in the land market.

The findings also indicate that land use regulation had a 'lot-size effect on value'. The demand curves analysis conducted in Section 6.2.1 (Figure 6-2) for the fiscal years preceding and following the land use regulation shows a higher price shift towards small-sized land parcels in the Kathmandu Valley. These results agree with the 'value differential with size' effect caused by Nepal's subdivision restriction (Banjara, 2019).

In Nepal's high land-value urban areas, such as the Kathmandu Valley, smaller land parcels are usually used for individual housing, whereas larger land parcels are used for urban development, industrial estates or agricultural farming. Most people cannot afford larger land parcels unless they purchased them through joint ownership. However, subdivision was restricted for non-agricultural purposes which resulted in a low supply of residential land. The demand curves analysis (Figure 6-2) shows that the price of small-sized parcels increased in comparison to that of large-sized parcels after the enforcement of subdivision restriction. The large-sized parcels are usually used for agricultural purposes. This suggests that agricultural land value tended to be price stagnant, whereas the residential land value in Kathmandu Valley increased following the land use restriction.

The market also saw a reduction in mortgage availability after the introduction of land use regulation. The subdivision restrictions did not allow landowners to sell their land when they wished. The number of blacklisted borrowers increased 18.8% from July 2017 to July 2018. Non-performing loans (NPLs) considered 'bad loans' among Nepalese BFIs, also increased. Total NPLs of Rs 36.1 billion in 2016 increased to Rs 36.8 billion in 2017 and then Rs 44.2 billion in 2018. BFIs reduced the fair market value ratio from 60% to 40% and loan-to-value ratio from 50% to 40% of the collateral's fair market value in Kathmandu Valley. The number of landowners receiving real estate loans reduced after the introduction of land use regulation by 4.5%

in the one-year period from June 2017 to June 2018, as presented in the Figure 6-4 in the previous chapter.

There was an overall increase in the transaction cost after the enforcement of subdivision restrictions. The average transaction time for a parcel subdivision following the subdivision restrictions was found to be approximately three weeks, compared to five days before the introduction of the land use restrictions due to the additional verification processes required. The World Bank's *Doing Business 2018* report shows an increase in property registration time from five days in 2017 to six in 2018. However, the report does not specify any changes associated with introducing land use regulation in Nepal (World Bank, 2017, 2018, 2019). Furthermore, the Commission for the Investigation of Abuse of Authority (2020) advised the Government of Nepal to review the subdivision restrictions which resulted in paying unnecessary costs during land transactions.

A mixed scenario was found regarding the changes in taxation. The government did not change the rate of the transfer tax that a buyer needs to pay during the land transaction. The transfer tax rates of 5% and 4.5% of the transacted land value in metropolitan and municipal areas, respectively, remained unchanged after the introduction of land use regulation. Despite no change in the transfer tax rate, landowners had to pay more tax than before the restriction was introduced because of the increase in land value.

There was a percentage decrease in the revenue collected because of the reduction in the transaction volume due to the subdivision restrictions. The percentage change in revenue collected in each consecutive year in the government treasury decreased by 8.5 % in Kathmandu Valley (Nepal Rastra Bank, 2016a, 2019b).

A restrictive provision in the land use regulation to control the 'no use' of land was implemented in some of the local governing bodies. Penalties of approximately Rs 3800 and Rs 40,000 per hectare per year were found in two municipalities of the Kathmandu Valley, Godawari and Dakshinkali. The penalty was area-based rather than value-based. Given that the average size of agricultural landholdings is between 0.23 and 0.59 hectares in the Kathmandu Valley (Survey Department, 2003), the penalty turned out to be ineffective in driving landowners' use of the land.

As discussed, the government experienced a relative decline in revenue, whereas a landowner, as an individual stakeholder, had to pay more transfer tax after the implementation of land use regulation. The increase in tax payment did not bring any significant change in terms of supply, value or use of land, nor did it control any speculative investment in the land market.

Few landowners were found to have been paid compensation for the land acquired by KVDA for the road expansion program (Neupane, 2015); only landowners who secured court orders received compensation (Khanal et al., 2017; Shrestha, 2019). The total compensation of NRs 87 million was not adequate when compared to the total land value of NRs 509 billion (Kathmandu Valley Development Authority, 2015a). The lack of compensation for the loss of their property resulted in financial losses to landowners in the Nepalese land market.

7.2.2.2. Social Dimension

Documentary evidence indicates that the impact of land use regulation across the social dimension generated dissatisfaction, as noted by the relative increase in land related conflicts and court cases. Transaction failures caused by the subdivision restrictions led to an increase in lawsuits between buyers and landowners over the advance payment made for purchases. The number of court cases relating to an advance payment increased 23 times in Kathmandu District, 13 times in Lalitpur District, and eight times in Bhaktapur District.

Following the subdivision restrictions, the number of inheritance-based subdivision requests increased threefold in Kathmandu District, and fourfold in Bhaktapur and Lalitpur LROs. Parcel subdivisions relating to divorce cases showed a sharp increase in the Kathmandu District LROs, as illustrated in Figure 6-14. The Commission for the Investigation of Abuse of Authority (CIAA) stated explicitly that the land use regulation caused to increase court orders for subdivision and led to family fragmentation and social disintegration. From a social perspective, the market outcome was entirely unexpected and increased the social burden on landowners (Commission for the Investigation of Abuse of Authority, 2020).

Slum-dwellers, evicted from the flood hazard areas, when offered safe residential units in Kathmandu, showed their dissatisfaction by rejecting the government plan because

the newly built units were too far from their original locations, as illustrated in Section 6.3.3. Similarly, the number of households advised to resettle to the safer areas initially showed their reluctance to do so because the new location was too distant to their existing areas of residence.

7.2.2.3. Environmental Dimension

Structural measures taken to mitigate the flood hazard in the Kathmandu Valley protected approximately 517 hectares of agricultural land and 485 hectares of the built-up area along the edge of major rivers, particularly the Bagmati, Dhobikhola and Vishnumati Rivers. Approximately 20,000 land parcels were protected from flooding of 50-year return period. Residential land development following the river protection works was carried out in seven land-pooling projects, producing approximately 12,000 developed land parcels in the land market (Section 6.4.1, Table 6-5) (Shrestha et al., 2017; Faust et al., 2020).

Implementation of the land development plans produced by the local municipalities supplied quality-enhanced residential plots in the Kathmandu Valley. The developed residential areas featured widened streets and open space. The 20% of total space provided through the expanded road and the average open space of 5% in 13 land pooling projects are environmentally far better than the average 0.5% of open space in the congested surrounding non-planned areas of Kathmandu Metropolitan City (discussed in Section 6.4.2). Therefore, the quality of residential land was improved after the implementation of land pooling, causing the land's value to increase compared to the surrounding unplanned areas. The surrounding land's average price near the Ichangunarayan Land Development Area was around Rs 120,000 per Ana (approximately 32 square metres) in 2006. In contrast, the land sold through an auction within the project areas was priced at Rs 3 million per Ana in 2019 (Kathmandu Valley Development Authority, 2019). The increase in the land price was attributed to the residential land quality which added higher environmental value than that in the surrounding unplanned areas.

However, the land use scenario outside the land pooling or privately developed urban areas is different from the above. The land classification system does not designate residential, commercial, and industrial zoning to around 80% of the Kathmandu Valley

area. Surveyors in charge of cadastral resurveying categorise unused fallow land as agricultural. Fearing that their unused land may be permanently turned over to agricultural use, landowners proceeded to construct individual houses on their vacant land after the subdivision restrictions. While the market was experiencing a reduction in supply, the number of housing approvals increased sharply in the Kathmandu Valley. The failure to allocate land for non-agricultural purposes resulted in haphazard development in Kathmandu Valley. The inappropriate zoning challenged the government's regulation of the subdivision restriction which was designed to preserve agricultural land. However, the result had the opposite effect by accelerating haphazard construction.

7.2.2.4. Institutional Dimension

The enforcement of land use regulation affected landowners' rights to sell their property and limited buyers from accessing the land. The subdivision restrictions also affected landowners who could not buy adjoining sections of land, even for road access. The number of backlogged applications in survey offices for parcel subdivision for the purpose of road construction increased from three to 56 in Bhaktapur, three to 89 in Lalitpur and 11 to 97 in Kathmandu District Survey Offices between 2017 and 2018. Furthermore, a reduction in the transaction volume of 25% following the subdivision restrictions reduced land availability. With the supply decreased and the land price increased, the land became less accessible to many stakeholders in the land market.

The enforcement of the lot size standards in subdivisions also affected the land market. If the new lot size standards were not enforced in the new town development area of Kathmandu Valley, then 52% of the land parcels would qualify for a subdivision. However, with the lot size standard enforced, 80% of the parcels are not eligible for subdivision. As most lots in the Kathmandu Valley range in size between 80 and 127 square metres (two Ana- four Ana) for housing purposes, the new lot size standard became a severely restrictive factor that reduced land accessibility in Kathmandu Valley's new town development area. The rule affected both the buyers and landowners, the former willing to buy a piece of land through the subdivision process and the latter to sell their property on the formal land market.

Due to poor communication by regulatory authorities regarding the implementation plans, affected landowners were unaware of the plans and continued to use the land as they had originally planned. However, they were later affected by several restrictions, such as forced acquisition for road expansion, subdivisional control and land use categorisation. When KVDA acquired approximately 130 hectares of privately owned land for roads (Neupane, 2015), approximately 52,000 lots were impacted by road widening in the Kathmandu Metropolitan area. There were 484 court cases registered in the district, appellate and supreme courts by landowners against KVDA demanding security of property rights in relation to road expansion and compensation (Khadka, 2015; Shrestha, 2019).

7.3. Synthesis: Complementarity and Interpretation

This research follows a deductive, mixed-methods approach to identify the impact of land use regulation on Nepal's land market, as illustrated in the generic Saunders Research Onion design (Saunders et al., 2019). An exploratory mixed-methods design further elucidated by Creswell (2018) allows data analysis in a sequential manner whereby the qualitative findings from the first phase connect to the second phase's quantitative results to allow the researcher to explore the phenomenon more deeply. In this research, a mixed-methods design framework was adopted to synthesise the findings of the qualitative and quantitative study in the first phase and the quantitative findings in the second phase. The synthesis supports complementarity, as illustrated in Figure 7-3.

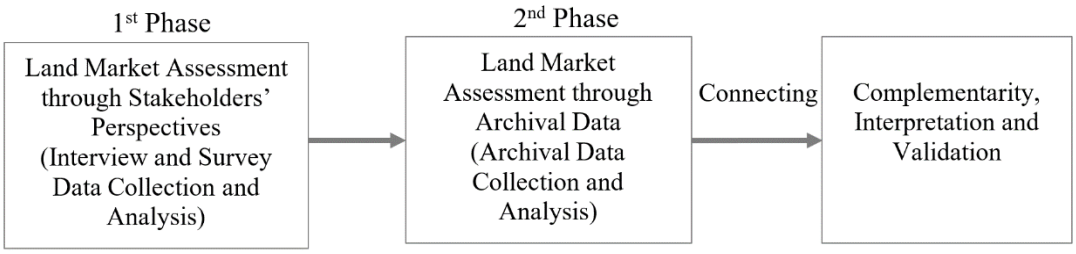


Figure 7-3: The sequential mixed-methods design

7.3.1. Complementarity

This section focuses on answering the mixed-methods research question: How do the perspective-based findings compare, complement and contrast with the findings from documentary evidence and archival records?

A general concern over the outcome of mixed-methods research is whether the qualitative data inform the quantitative data and, conversely, whether the quantitative data inform the qualitative data (Creswell, 2018). The answer, in this case, is generally yes. The direction of the changes across economic, social, environmental, and institutional dimensions identified through the stakeholder's perspective generally support the documentary evidence. Apart from the impact direction, the stakeholder findings complement the documentary evidence by presenting the impact variation across impact factors and dimensions. From the initial findings, both the quantitative and qualitative data helped enhance the researcher's understanding of the impact of land use regulation on Nepal's land market.

Although the perspective-based findings show differences in the impact of land use regulation on the land market across various stakeholder groups, the study also exhibits consistency in the overall trend in the identified impact. The documentary-based research findings eliminate doubt over the measured impact across dimensions by providing grounded evidence. The synthesis of the findings warrants further discussion on how the impact varies and why such variation occurs across each dimension. In the following sections, the complementarity in findings for each dimension is discussed.

7.3.1.1. Economic Dimension

It was found that the maximum negative impact across the economic dimension was associated with the impact factor of compensation (Table 7-1). There were multiple issues of compensation connected with the implementation of land use regulation in Nepal, including compensation for losses resulting from road expansion and for the loss caused by the landowners' inability to sell the developed plots in the land market. There was also the perception that using the land for agriculture should be subsidised and supported by the government.

Stakeholders perceived that the forced acquisition of private land and demolition of their property during the implementation of road expansion impacted them financially because of a lack of compensation. However, the implementing authorities justified their actions by claiming that road expansion implicitly had a 'positive value impact' for the landowners as they received widened road access and increased land values. They further argued that it is the landowner's responsibility to be aware of possible road expansion. The government also claimed that compensation for the demolition of their houses was paid to those landowners who had already received construction approval from the local government or who had received a court order (Shrestha, 2019).

Table 7-1: Synthesis of findings across the economic dimension

Findings from stakeholders' perspectives			Findings from archival study
Perception	**Impact direction**	**Impact Index**	
Impact Factor: Compensation			
Forced acquisition of land for right-of-way extension and demolition of private property without compensation. Compensation for loss due to failure to sell the land product was not provided. Subsidies for agricultural use not provided.	Negative	−0.1161	Compensation partially paid. Compensation paid through court orders. Compensation as per the minimum valuation. Delayed compensation. Subsidies for farmers provided.
Impact Factor: Valuation			
Residential land prices increased. Agriculture land prices decreased/ financial strength reduced due to a reduction in the value of potential residential land already purchased. Land price speculation increased.	Negative	−0.0797	Average land price increased. Value of the residential land parcel increased. Values of the larger agricultural properties remain almost stagnant. Demand for residential land increased. Value of the smaller-sized parcels increased compared to the value of the larger parcels. Market price exceeds the recorded price
Impact Factor: Mortgage Availability			
Timely payment of loan instalments became more difficult Land loan recovery risk increased. Financial strength of banks and financial institutions decreased	Negative	−0.0665	Non-performing bank loans increased. Loan-to-value ratio decreased. Fair Market Value Ratio decreased. Percentage of loans issued to sector (landowners) decreased. The number of blacklisted borrowers increased. Number of landowners receiving the real estate loan decreased despite an increase in total loan account. Mortgage availability decreased.
Impact Factor: Transaction Cost			
Time frame for subdivision-based transactions increased. Transaction cost for land subdivision increased.	Negative	−0.0381	Additional time for the confirmation of road and river boundary required. Additional fees for subdivision reported.
Impact Factor: Taxation			
Transfer tax increased. Penalties for misuse/no use was an additional burden.	Negative	−0.0101	Individually payable tax payment increased but overall revenue collection decreased. Penalties provisioned.

The fact that KVDA paid partial compensation indicates that local governments did not have appropriate road expansion plans formulated at the time when construction approval was granted. Even if there had been a plan, the landowner's building plan was not verified to check whether the building footprint partially overlapped the proposed road boundary. Whatever the reason, the road expansion plan was not communicated to the stakeholders, even after it had been finalised. Landowners had used their land as per their plan, but KVDA later claimed that a part of the land was needed for the road expansion.

Most landowners did not anticipate having to give up part of their land in Kathmandu Valley for a public purpose. The debate between KVDA and landowners continued for an extended time until the parties reached an agreement on an acceptable compensation rate. Over time, the land value changed in the market and landowners disagreed with the amount of compensation based on the minimum land value specified years before. KVDA then commenced legal action, with the moral support of those people who were tired of everyday traffic congestion, which later was questioned by the court (Khadka, 2015; Himalayan News Service, 2019; Shrestha, 2019). KVDA's road expansion program received significant criticism in the media (Shrestha, 2015).

The court-decision which favoured compensation-based acquisition indicates that the implementing agencies needed to be aware of private property rights before enforcing the road expansion. However, landowners could not receive compensation for the land acquired by KVDA and compensation was only paid for building and construction impacts.

The enforcement of subdivision restrictions for agricultural land motivated landowners to use their land for agricultural purposes and compensation was provided in the form of subsidies. Government records show that subsidies on chemical fertilisers and interest discounts on agriculture loans were available to support farmers (Government of Nepal, 2018a).

With Nepal being an agrarian nation, the Government of Nepal prioritises subsidies to boost production, improve food security and reduce poverty (Timalsina, 2019). However, low productivity, coupled with high production costs, diversion of agricultural loans to the non-productive sectors and a lack of storage for agricultural

outputs, forced many farmers to leave agriculture-based livelihoods (Shrestha, 2011). There was already pressure to convert agricultural land to residential land due to an increasing population, rural-to-urban migration plus an existing housing deficit (Upreti et al., 2017).

Many members of farming communities benefited economically from the rising value of land by selling their land at comparatively high prices. The financial gain made by selling the land was far more than could be gained through agricultural production. As such, landowners had an incentive to subdivide their land rather than being engaged in agriculture-based livelihoods. To divert landowners towards a livelihood in sustainable agriculture requires motivating them through providing subsidies, ensuring market distribution of their produce and a return on their investment. However, with the subsidies being less than the benefit gained through land subdivision, the imposition of subdivision restrictions has proven counterproductive.

The stakeholders' perception of the negative impact on the land market associated with valuation changes is attributed to the mixed outcome, as exhibited by the archival research findings. The overall increase in land value was the result of many small-sized parcels being sold at a higher price. The larger-sized parcels were mostly agricultural land and fell under the restriction on subdivision. As these parcels could not be sold readily on the land market, their prices stagnated, and landowners were reluctant to sell their land. This affected the land supply in the Kathmandu Valley, which had already been experiencing a housing deficit. With the fear that land use regulation would further reduce land supply, landowners began to pay higher prices for smaller land parcels.

The subdivision restriction also affected mortgage availability in the Nepalese land market. With the high level of zoning uncertainty in the country, land developers engaged in the planning and developing of private land, which was mostly agricultural, in the hope that they would receive approval (Paudel et al., 2013; Upreti et al., 2017). However, after the emergence of the subdivision restrictions, KVDA could not approve the proposed developments and the Land Revenue Office could not approve the subdivision applications (Government of Nepal, 2017b). Consequently, private developers could not sell these properties despite the demand for developed land in the land market. Additionally, they could not make loan repayments and borrowers were

blacklisted for failing to repay their loans. With the rise in loan defaults, the total amount of non-performing loans increased, and financial institutions reduced the loan size to the real estate sector. The loan-to-value ratio was also reduced from 60% to 40% following the subdivision restriction and therefore, there was a reduction in mortgage availability.

An increase in the transaction cost was experienced by landowners and developers due to repeated visits to the land revenue and survey offices to conduct a transaction, including travel and time expenses, and the reported payment of motivation cost to the staff involved. Landowners expected clarity and transparency in the land transaction process. Prior to the imposition of the restriction, a subdivision-based transaction in Kathmandu Valley would usually be finalised within five days. In contrast, following the subdivision restriction, the transaction took more than three weeks to be completed because of requirements by surveyors to field-check, or for road boundaries to be confirmed through KVDA.

The lowest impact identified was with respect to taxation as the government did not make any change in the tax rate after the changes in land use regulation. The 'no use' penalty system did not have significant impact on the land market and was found to have been only enforced in two municipalities in Kathmandu Valley with a very low penalty fee.

7.3.1.2. Social Dimension

Stakeholders perceived that lack of awareness of the subdivision restriction created a conflict situation and mistrust between buyers and landowners over advanced payments (Table 7-2). Nevertheless, they continued to invest in the land, which was impacted through the demolition of their property, forced acquisition or unapproved subdivision restrictions. Landowners faced the threat of eviction and the fear of being blacklisted, which contributed to their mental stress. To escape this stressful situation, they found other legal ways of gaining approval for subdivision, such as by court orders, receiving a family inherence or by filing for divorce. The subdivision restriction created a social burden, which was an unexpected outcome. While the new regulation made the subdivision process quite difficult, subdivision did not come to a complete halt because of the legal loopholes available. However, the negative impact

it brought across the social dimension created conflicts and the government was advised to lift the restrictions.

Table 7-2: Synthesis of findings across the social dimension

Findings from stakeholders' perspectives			**Findings from documentary study**
Perception	**Impact direction**	**Impact index**	
Impact Factor: Awareness			
Engagement of stakeholders in the land market activities during the restriction. Conflict between landowners and buyers increased; trustworthiness decreased. Arguments occurred between staff and clients. Confusion about subdivision restriction.	Negative	−0.0886	Increase in conflict cases between landowners and buyers over the advanced payment. An increase in land-related disputes in the courts.
Impact Factor: Expectation			
Mental stress in stakeholders – fear of being blacklisted, informal housing construction, threat of eviction. Court orders sought for subdivision of jointly owned land. Inheritance-based subdivision increased. Rising incidence of family disintegration/divorce.	Negative	−0.0656	Protest against the subdivision restriction and denial of right-of-way. Increase in parcel subdivision through family inheritance. Increase in parcel subdivision through divorce cases. Recommended to lift the subdivision restriction and land classification system
Impact Factor: Proximity			
Designated safe relocation area was far from the existing dwellings. The distance of the resettlement area from the original dwelling location increased.	Negative	-0.0034	The distance of the relocation area from the original dwelling location increased. Livelihood and employment opportunities issues to be considered.

The factor of proximity produced the lowest level of impact in the land market. It applied to only a limited area of that market—resettlement of the people living in hazardous areas, which did not significantly impact the overall land market in Kathmandu Valley.

7.3.1.3. Environmental Dimension

Stakeholders' perspectives of the risk reduction factor as having the highest importance (as shown by composite weights in Table 5-14) underscores the severity of natural disasters and that its impact on the land development process produced a positive effect on Nepal's real estate market (Table 7-3). The *Land Use Policy 2015* mandates that a risk zone be specified on land use maps to identify the risk areas associated with flooding and landslides. Although the risk boundary delineation tends to reduce the land value within the risk zone (Shultz and Fridgen, 2001; Jung and Yoon, 2018), the pressure of population growth and the demand for residential land pushed the implementing agencies to take steps towards risk reduction, which added value to the land. Road expansion was a part of the risk reduction process and provided a wider corridor for vehicle movement. Similarly, the delineation of flood risk boundaries followed by flood mitigation measures protected the land and helped to supply developed residential lots in many floodplain areas of the Kathmandu Valley. However, the protection measures were focused on the Bagmati River and its tributaries, the Dhobikhola and Vishnumati rivers in Kathmandu District. As such, the overall contribution of risk reduction in the impact assessment was considered slightly positive.

The impact factor 'Quality of Residential Land Use' was also associated with a positive impact on the land market. This factor compares the contribution of the urban development project towards the environmental benefit of residential areas to the unplanned areas in the Kathmandu Valley. However, the residential land development of approximately 3.6 square kilometres contributed by the land-pooling project (Faust et al., 2020) seems to have produced a minimal positive environmental contribution compared to the 136 square kilometres covered by the unplanned built-up area in Kathmandu Valley (Rimal et al., 2017). Similarly, the supply of approximately 30,000 quality residential housing plots (as discussed in Section 6.4.2) was not sufficient when compared to the estimated additional need of 440,000 dwelling units in the Kathmandu Valley by 2021 (Shrestha, 2010).

Table 7-3: Synthesis of findings across the environmental dimension

Findings from stakeholders' perspectives			Findings from documentary study
Perception	**Impact direction**	**Impact index**	
Impact Factor: Quality of residential land			
Open space considered; wider space provided. Physical infrastructure developed.	Positive	0.0919	Total open space including the space in the street was approximately 30% of the total area of 13 government-run land development projects. Physical development-associated land use planning undertaken. Land value in the urban development area increased. Number of quality-enhanced plots released in the land market.
Impact factor: Risk reduction			
Flood hazard control performed. Width of the road corridor increased.	Positive	0.0662	Embankment constructed; flood risk reduced; number of safe plots supplied. Road width expanded. Number of developed plots in flood-protected area released
Impact factor: Suitability of zoning classification			
Insufficiency of land use categories, haphazard use of land No recognition of mixed land use, a dilemma in the use of land	Negative	−0.0211	The relative number of housing approvals increased at the time when land was under restriction. Area for residential development not allocated.

The impact of the inappropriate zoning reflects the negative outcome across the environmental dimension. Until 2017, inadequate and ineffective land use planning and the weakness of the government in the face of the real estate sector lobby were the overarching factors that put direct commercial pressure on land in Kathmandu Valley. However, the government did not introduce a comprehensive land classification system as defined in the land use policy and relied on the land classification based on the cadastral records of 1964. Therefore, haphazard land use for housing purposes continued and challenged the aim of the subdivision restrictions. From the environmental perspective, the outcome continued to be negative in the Kathmandu Valley.

7.3.1.4. Institutional Dimension

Stakeholders perceived that the success of the implementation of land use regulation lay in an effective coordination mechanism which could connect all stakeholders to share land use information in a participatory and collaborative environment (Table 7-4). Due to the lack of coordination, stakeholders were unaware of what others were doing. The failure to update the cadastral map with the KVDA's expanded road boundary plan is an example of the lack of coordination that affected the property rights of many landowners. While there were already prepared land use maps within the then National Land Use Mapping Project under the umbrella of the then Ministry of Land Reform and Management, the enforcement of land categorisation by the same Ministry was based on the old maps of 1964, which highlights the poor coordination.

The perspective of the landowners on the subdivision restriction in terms of property rights differed from that of the implementing authority. The implementing authority's view was that the land use restriction controlled further fragmentation of agricultural land, which in turn was a step towards ensuring food security for all of society. However, the regulation did not produce the desired result due to high demand for residential land. Although there was a decrease in transaction volume, the non-agricultural use of land accelerated in the Kathmandu Valley.

Adoption of lot size control was a crucial factor in the land development process as viewed by the implementation authority in Nepal. The uncontrolled land fragmentation to the smallest lot size (80 square metres) poses a problem in the land development process. There is the potential for smallholders to be displaced in the redistribution process, which would further bring land rights issues to the fore and hamper the whole new town development plan proposed by KVDA. To avoid these institutional issues, the KVDA enforced lot size control at the outset of the new town development program in the Kathmandu Valley.

However, these controls reduced the availability of land to the land market. Owners expecting to buy an additional piece of land from an adjoining parcel could not do so because of this restriction. Overall, the impact of land use restriction was negative across the institutional dimension.

Table 7-4: Synthesis of findings across the institutional dimension

Findings from stakeholders' perspectives			Findings from documentary study
Perception	**Impact direction**	**Impact index**	
Coordination			
Landowners unaware of the road and river boundaries; cases where part of the private land overlapped the road or river zone. Insecure property rights. Uncertainty of land zoning.	Negative	−0.1876	Property rights violation cases increased. Limited accessibility to land use information. No updated land records. Conflicting land zoning by various agencies. Court complaints demanding to secure property rights.
Subdivision Restriction			
Right to sell or buy the property obstructed. Availability of / accessibility to land decreased. Ease of use of land reduced. Informal transaction promoted.	Negative	−0.0585	Total transaction volume decreased, Subdivision based land transaction reduced. Land availability for housing purposes reduced; number of land development projects reduced.
Lot Size			
Right to sell or buy property. Availability of land decreased/ Accessibility to land decreased	Negative	−0.0288	Availability of selective land parcel size for subdivision.

7.3.2. Interpretation

The discussion in the previous sections focused on how the findings from two different approaches complement and contrast each other at the impact factor level in each dimension. I now interpret the synthesised results at a higher level by discussing why such variation occurred in the land market at the dimension level.

7.3.2.1. Variation of impact - How?

Across the four dimensions, I identified a differential impact only across the environmental dimension: two impact factors contributed positively, and one impact factor negatively. The change brought by inappropriate zoning in a negative direction

was found to be relatively smaller than the positive changes contributed by risk reduction and changes in the quality of residential land. It is suggested that this is because the Kathmandu Valley was already affected by a haphazard land use pattern and, therefore, the restriction did not contribute to a further negative outcome in the land market across the environmental dimension.

However, the other two factors—risk reduction and quality of residential land—contributed to the land market by supplying environmentally improved and value-added residential plots and, therefore, were considered positive. However, the land regulation itself reduced the supply of such land because there were insufficient areas of non-agricultural land that could be used for residential purposes. The impression that the land pooling project supplied quality plots was true to the extent that the plots were better in quality than the surrounding unplanned areas. Furthermore, the 5% open space target in the land pooling project was based on the 2011 population that yielded 2.55 m^2 per person, which is an improvement over the overall open space currently available in Kathmandu Metropolitan City but is negligible in comparison to the 9 m^2 per person recommended by the World Health Organisation (Faust et al., 2020). With these findings, the total impact turned out to be slightly positive in the land market across the environmental dimension.

The findings suggest that the Nepalese land market experienced an overall negative impact across the economic, social and institutional dimensions. The economic or financial strength of landowners and their satisfaction are linked to the provision of property rights (Dincer, 2007; Selinske et al., 2014; Subedi, 2016). Ensuring land or property rights is a precondition for land-related investment (Deininger, 2003). Property rights are often the most contentious issues in the land use–land market relationship (Williamson et al., 2010). Inadequate attention to property rights during the implementation of land use restrictions not only leads to complaints, court cases and conflicts (Godschalk, 2004; Jacobs, 2010) but also deprives landowners of their ability to participate in the economic development process. The land market structure rests on the foundation of the institutional framework defined by the laws and policies that ensure the landowners' property rights (Dale and Baldwin, 2000). In the Nepalese case, two of the impact factors across the institutional dimension—the subdivision restriction and lot size standard—limited landowners' ability to participate in the land

market activities as they did not allow them to sell their property when they needed to or limited their access to the land. Although these restrictions reduced land consumption, which appears positive from an environmental perspective, they negatively impacted the market across the economic dimension. Given that the role of property rights in a land market is fundamentally essential, any policy decision that reduces property rights is considered more negative than the impact across other dimensions.

When comparing the impact result across the economic and social dimensions, I found landowners circumventing land use restrictions through court orders, divorce and family fragmentation. These complicated pathways indicate that the economic impacts were more severe than the social consequences in the Nepalese context.

7.3.2.2. Variation of impact - Why?

The initial motive behind the introduction of a land use policy in Nepal was to control land fragmentation and conversion of agricultural land into residential land to ensure food security (Government of Nepal, 2012). The amended version of the 2015 policy further specifies risk reductions and the resettlement of those living in hazardous areas (Government of Nepal, 2015b). Nepal's government adopted a strategy of land pooling, subdivision restrictions and lot size standards to control land fragmentation as specified in these policies. The policy also set strategies in relation to land zoning, establishing an organisational framework, coordination mechanisms, data sharing and distribution, participation, and awareness-raising to implement the land use policy. However, this study reveals that limited effort was applied to utilising these strategies during the implementation of land use regulation, which led to a negative impact across three dimensions. A brief discussion of major factors contributing to the negative outcome in the Nepalese land market is presented below.

Coordination mechanism

There is a need for improved coordination at all levels of government in order to implement land use regulation in Nepal effectively. A dedicated organisation is required to bring all stakeholders together, share information, discuss their concerns, and identify the potential hurdles in land regulation processes in the land market. The Nepalese government's mandate for implementing land use regulation was

contradictory between the *Land Use Policy 2015* (Government of Nepal, 2015b) and the *Land Use Act 2019* (Government of Nepal, 2019). The former assumes a land use department at the federal level as the primary implementation body, whereas the latter devolves power to the local governments. This ambiguity needs to be resolved.

Zoning uncertainty

The *National Land Use Policy 2012* defined six different land use zones. The *Land Use Policy 2015* assumes eleven different land use zones. The *Land Use Act 2019* defines ten different land use zones. KVDA defines 13 different land use zones (Kathmandu Valley Development Authority, 2015b). The *Land (Survey and Measurement) Act 1963* of Nepal simply defines two different systems of classification in two different areas: (i) agricultural subcategories of land (Acharya, 2008) in non-resurveyed areas and (ii) two land use categories—Agricultural and Residential/Commercial—in the resurveyed cadastral areas. While all these classifications have been specified through legal mechanisms (except that defined by KVDA), the government adopted the classification scheme defined under the *Land (Survey and Measurement) Act 1963*, which is not appropriate for addressing the need for land for non-agricultural purposes in the country. This inappropriate zoning has led to haphazard use of the land, thus posing a threat to sustainable development. The classification schemes defined in the *Land Use Policy 2015* and the *Land Use Act 2019* are simply an elaborated form of what was specified in the *National Land Use Policy 2012*. It would be more effective if the implementing agency adopted the latest classification scheme developed under the state's statutory law rather than following one defined half a century ago. This would align with what has been advised by the Commission for the Investigation of Abuse of Authority (2020).

Data sharing mechanism

The *Land Use Policy 2015* of Nepal mandates the establishment of an information system to improve the accessibility of land use information in the country. However, the federal directives for distributing digital map data strictly prohibit the distribution of land zoning data in Nepal (Ministry of Land Reform and Management, 2012b). With this legal ambiguity in place, the land zoning data was not made available to the public, keeping stakeholders uninformed of what land zones exists and where. While

the government has established a National Geographic Information Infrastructure in Nepal, the program suffers from a lack of participation, collaboration and data sharing. (Subedi et al., 2009).

Awareness-raising

The *Land Use Policy 2015* explicitly specifies the need for awareness-raising for an effective implementation of land use regulation in Nepal. The implementing authority needs to ensure that stakeholders are aware of land use planning provisions and associated rights, restrictions and responsibilities. An effective plan requires the implementation process to be clear and the authority to inform the public about its limits, and for stakeholders to recognise their responsibilities regarding their future land use decisions. Stakeholders need to be appropriately informed of regulatory changes relating to land use change to allow them enough time to adjust their decisions. A clear implementation date of the subdivision restriction would provide adequate time for making decisions on the impact of the policy's introduction.

Compensation

The findings also suggest that compensation should be available for a property loss incurred due to the implementation of land use regulation in Nepal. However, the greatest institutional challenge in respect of compensation is the recent constitutional provision that rules out any possibility of receiving compensation, which therefore contradicts the fundamental right to property in Nepal (Article 25-4) (The Constituent Assembly of Nepal, 2015). This legal hurdle needs to be addressed. However, there are other issues that also need to be addressed.

Kathmandu Valley has undergone a rapid process of urbanisation since the restoration of democracy in 1990. Motivated by the spiralling price of land, due to increased capital flows and remittances from emigrant workers as well as credit made available by domestic financial institutions, landowners have considered real estate a fast route to riches and a safe haven for their savings. Along with the commercial pressure exerted by rural-to-urban migration and a surge in land prices, Kathmandu Valley's fertile agricultural land underwent rapid fragmentation throughout its urban areas. As potential investment opportunities elsewhere in the country, or in other economic

sectors in the cities, are limited, landowners, investors and developers were all focused on the land supply at the cost of agricultural land depletion.

In such a situation, the most challenging task for the implementing authorities is to change the landowners' minds from their preoccupation with real estate to other productive sectors such as agriculture. A lack of adequate irrigation facilities, access to a commercial market and a reasonable price for the value of their products, as well as transportation problems, have been significant factors driving landowners away from agriculture-based activities to easy and fast-tracked earnings through real estate. In this situation, the only way to attract investors away from the unproductive and speculative real estate market to the more productive agriculture sector is to provide subsidies for farming activities. These may include ensuring delivery to the market and safe storage of the produce for a reasonable period, offering insurance for their products, and providing value for their products. This would be an alternative approach to compensation for those landowners rather than enforcing the restrictive subdivision regulation in Nepal, which is entirely unproductive with the multi-dimensional repercussions discussed in this study.

7.3.2.3. Land Market Imperfection

A market cannot run without institutional control, and therefore, by nature, it cannot ever be perfect (Phang, 2013). However, besides this theoretical base, I found that the implementation of land use regulation further compromised the land market because of inefficient allocation of resources. This resulted in an increase in transaction costs, conflict between stakeholders, limited land supply and informal land transactions, and reduced credit supply. The next sections discuss the Nepalese land market imperfections together with the reasons associated with the imperfection.

Availability of land use information and transaction cost

A land market operates on the availability of information. The Nepalese land market has been operating based on a partially digitalised cadastral information system. Most of the land records do not contain land use information except for the agricultural subcategories. The road zone boundaries enforced by the local bodies do not match the spatial cadastral boundaries, and none of the stakeholders are aware of zones overlapping each other. As there is no land use information infrastructure, survey

offices have depended on information from external agencies. This creates procedural delays in the transaction process and increased transaction costs.

Subdivision approval and conflict between landowners

Stakeholders, unaware of the subdivision restrictions, continued to engage in land market activities. However, the failure of land transaction resulted in deteriorated relations between landowners and buyers (as shown in figure 6-11). Applying for a court order or getting into an inheritable land subdivision was the only legal mechanism to subdivide a parcel if it had undergone a previous subdivision within the fiscal year. In the pursuit of subdivision approval, stakeholders were involved in unnecessary court cases, which posed a social burden.

Restriction, low supply, and informal transactions

Lot size control allowed selected land transactions in the Nepalese land market, while subdivision control reduced transaction volume. Most of the land transactions were associated with smaller parcels that did not require any subdivision. With the supply reduced, a potential buyer did not have access to the land. This reduced accessibility caused potential buyers to consider informal transactions that not only supported the landowners to pay their loan instalments but maintained the land supply as well.

Poor land classification and supply of the majority of demerit goods

The adoption of an inadequate land zoning and classification system for land use regulation did not support land which was suitable for residential or commercial use in Nepal. The classification simply defined the land in terms of agricultural suitability and could not allocate suitable land for non-agricultural purposes. The classification designates sloping and rocky land as the lowest grade of land for agricultural use. However, these lands are not considered as suitable goods in the land market as they do not qualify for residential or commercial purpose. There was scarcity of land for residential purpose. The demand for residential land increased to the extent that the municipalities started to grant individual housing construction on unplanned land.

Lack of market price information and price speculation

Nepalese land markets were affected by the participants' expectations regarding future price movements. Unregistered land brokers operating at the local level are a major set of actors in the Nepalese land market who often advertise in the newspapers, and they normally include a commission in their price. The increase in the relative demand for residential land with a corresponding reduction in the supply, generated a 'hope value' of land to landowners and land brokers. As there was no information available to the public about the prices paid for similar parcels in the vicinity, the potential buyer remained unaware of the land's prevailing market value. This gave rise to price speculation in the market.

Credit supply and land accessibility

Banks and financial institutions are key stakeholders in the land market and provide financial support to those investing in the land market. However, the reduction in the supply of credit made it difficult for potential landowners to acquire sufficient funds to invest in land.

7.4. Validation of Research Outcomes

Depending upon the research type, qualitative or quantitative, and the methods applied to derive the result, the findings' validation differs across research studies. Fusch et al. (2018) argue that no single method, theory or observer can capture relevant or essential information. This statement particularly agrees with a mixed-method design that applies different data types and methods. The classical approach uses the classic concepts of validity and reliability, whereas the second approach employs several subjective approaches such as doctrinal relevance; philosophical and methodological validity; or convincing, trustworthiness, transferability, coherence, usefulness (Healy and Perry, 2000). Based on the analysis of 212 qualitative research articles on management studies, Kihn and Ihantola (2015) concluded that the classical approach to validation is given more emphasis than other subjective approaches. They further elaborate the classical validity into content validity, construct validity, internal validity, reliability and external validity/generalisability. The validation sequence, the contents of validation, approach and corresponding strategies have been summarised in Table 7-5.

Table 7-5: Validation strategy adopted in this study

Sequence	Validation Requirement	Validated Through	Validation Strategy
Interview	Contents and structure of the interview questions	Preliminary impact factors identified through desktop review. Interview contents discussed with local land experts	Content & Construct Validity
Questionnaire Survey	Contents and structure of the questionnaire	Impact factors refined with the information collected from the interview Outcomes of pre-survey discussed with local land experts	Content & Construct Validity
AHP	Calculated impact	Ensuring the consistency ratio of the identified weights is below 0.1. Impact checked across different group of Stakeholders	Reliability
Mixed-Methods	Identified impact	The convergence of the impact result from AHP and that derived through the secondary data analysis	Internal Validity
		Evidence from other studies	External validity

This research followed the mixed–methods exploratory approach, which consists of two distinct phases: a survey followed by archival study as detailed in Creswell (2018). In the first phase, qualitative data was collected through an interview, followed by the collection of quantitative rankings of impact factor in relative importance scale (Table 5-10), and scores on the perceived impact rating scale (Table 5-6) through the questionnaire survey. The purpose of the interview was to identify the land market impact factors relevant to the Nepalese land market. The appropriateness of the interview data firstly depends on the contents and the structure of the interview questions. Interview questions and their structure were discussed during the pre-meeting with the survey department executives and local experts before being finalised. After the interview, the questionnaire's contents and structure were reviewed and discussed during a second round of meetings held with the survey department's

executives and the local land experts to finalise the questionnaire. These reviews ensured the content and construct validity of the data collection instrument.

The questionnaire data were processed and analysed in AHP to derive the perceived impact measure. AHP performs analysis based on the weights of the alternatives. AHP results are only reliable if there is consistency in the judgements provided by the participants. AHP results are acceptable if the Consistency Ratio (CR) lies below 0.1 (Saaty, 1983). The consistency measure of the perception-based data in this study was below 0.1 across all dimensions, and therefore supports the claim that the impact results are reliable (Appendix 7). However, the stakeholders' perceived impacts require further validity to determine if they align with the existing land market conditions. In the second phase, the archival data and documentary evidence were collected and analysed, which helped explain and corroborate the survey results.

In this study, the emphasis has been on ensuring a high level of internal validity through the design process. Both the survey and archival data support and corroborate the findings. The internal validity of the combined results allowed the researcher to confirm the internal validity of results regarding the impact of land use regulation on the land market. The summary of results presented in Tables 7-1 to 7-4 shows 14 identified impact factors and the impact results associated with them. It was found that the results of the individual phases confirmed the findings of each stage. The remaining issues were also supported by the body of knowledge, which has been discussed in Chapter Two.

The findings' external validity is complemented by evidence from other theoretical and empirical studies relating to the land market, its assessment, and its relationship with land use (Dale and Baldwin, 2000; Williamson et al., 2010; Needham et al., 2011; Paudel et al., 2013; Upreti et al., 2017; Chand, 2019; Commission for the Investigation of Abuse of Authority, 2020; Faust et al., 2020).

7.5. Theoretical Discussion

This mixed-methods exploratory design framework aimed to identify the impact of land use regulation on the land market. Therefore, it is essential to discuss the findings with respect to the general premise of mixed-methods exploratory research design, mainly the availability of a guiding theory and the availability of variables and

methodological tools to be utilised in the process of identifying the impacts (Creswell and Plano, 2007).

The composite characteristics of a land market pose a dilemma in adopting a specific theory for its assessment (Needham et al., 2011). As such, a land market cannot be described through a single theoretical lens. The land market structure realised through the three-pillar model further justifies this claim because it offers a multiplicity of components, either in terms of three different pillars or participants who are involved in providing or receiving various services within a land market (Dale and Baldwin, 2000). A holistic assessment, the type undertaken here, requires a pragmatic approach to address the diversity of components and warrants theoretical exploration across multiple dimensions.

The primary function of the land market is to facilitate the transfer of rights in land. This process is affected by changes occurring in any component of the land market model. Land valuation and mortgage availability directly refer to the two pillars of the land market model, and any changes that occur in them can be directly perceived as the impact borne by the land market across the economic dimension (Dale et al., 2006; Ihlanfeldt, 2007; Lees, 2017). However, the impact of the introduction of land use regulation in Nepal went beyond these two pillars. The restrictive regulation impacted the economic/financial strength of participants through an increase in the transaction cost (Dale et al., 2006) and the transfer tax driven by the valuation (Muller, 2002). The Nepalese land market participants were further affected by losing their financial capacity when the restrictions were imposed on landowners without any compensation for their losses (Khanal et al., 2017), which is an essential factor discussed by many authors (Dale et al., 2006; Mangioni, 2014). A correlation coefficient of −0.81 between the median land price and transaction volume in the data (Appendix 14) supports the economic principle of supply and demand and indicates that increase in land price may have the effect of the reduction in transaction volume. This indicates that the increase in land price may have also negatively impact stakeholders' access to land (Deininger, 2003). A similar result was found with credit supply, which showed a positive correlation of 0.79 with transaction volume (Appendix 16). This indicates that the reduction in the Nepalese land market's credit supply may also have affected access

to land. The finding suggests that land use regulation does not only have implications across the economic dimension but also across the social dimension.

The land market supports economic growth and the welfare of society as a whole (Cheshire and Sheppard, 2002; Williamson et al., 2010a). In this sense, the land market should not be seen only through an economic lens. It should also be viewed through a societal lens that views whether land use regulation produces a socially desirable outcome (Deininger, 2003). Prior to the first phase of the study, I was unsure what social aspects meet the criteria of sufficiency to determine the impact of land use regulation on the Nepalese land market. The first findings indicated that the subdivision restriction resulted in an increased social gap between land market stakeholders and posed the risk of social disintegration, giving rise to conflicts and court cases. The second finding confirmed this situation with secondary data and external evidence (Commission for the Investigation of Abuse of Authority, 2020). The social findings also included that the stakeholders engaged in the land market at a social cost, as shown by the increase in parcel subdivision through court orders, family inheritance and divorce proceedings. The broader social and economic consequences could be subjects of further study.

At the theoretical level, environmental considerations in land use planning have produced value and supply effects on the Nepalese land market. The *Land Use Policy 2015* specifies 'land pooling' as an alternative subdivision control tool that supplies safer, value-added residential service plots. The risk-based land use planning provided an opportunity to move beyond planning for a natural hazard (Saunders and Kilvington, 2016). Land supplied by the land-pooling projects in Nepal, which are characterised by larger areas of open space and improved utility services, exhibited better quality residential land and higher environmental value that has been implicitly added to the land's value. The value of such land was observed to be approximately 50% higher than unplanned land in Kathmandu Valley (Faust et al., 2020). On the other hand, poor land zoning had a negative impact on supply and resulted in stagnant land values. Inappropriate zoning of the majority of the land as agricultural in Kathmandu Valley and restrictions led to a reduction of supply, which promoted haphazard development due to the lack of land available for housing.

The constructive approach adopted in Nepal's land pooling process was found to have a positive impact on supply and added value rather than the restrictive subdivision approach. At the outset of land pooling, a draft plan of the area is produced. The information is then shared, discussed, revised and agreed upon. The process takes into account physical development such as the construction of roads, utilities, open space, regularised plots, etc. It employs an interactive, coordinated and participatory approach and has been seen to be a success in the Nepalese context (Karki, 2004; Shrestha et al., 2017; Neupane, 2020). These features were lacking in the restrictive approach of subdivision control and land classification. The lack of available land use information to implement, monitor and control the subdivisional process only added to the problems caused by restrictions.

Effective land use management and efficient land markets form the basis of sustainable development (Enemark, 2004). However, 'land use' and the 'land market' have a reciprocal relationship: the former tends to control land use rights whereas the latter promotes freedom over land use (Jacobs, 2010; Williamson et al., 2010). In general, there are two overarching institutional issues concerning rights: the right to live in a safe environment without being affected by others' actions and the right of disposal of their property at their discretion (Koirala, 2015; Himalayan News Service, 2017). Amid these two rights, implementation authorities decide which one is important for sustainability (UNECE, 2005). In the Nepalese case, the motive behind the land use restrictions was to ensure food security which was being threatened by rapid fragmentation of land (Government of Nepal, 2017b; Upreti et al., 2017). While the chosen objective was supportive of the welfare of society, the approach adopted for the implementation suffered technical and institutional shortcomings such as lack of coordination, data quality issues, and the paucity of available land use information. The consequence of this was a reduction in supply of land, which in turn reduced the accessibility to land in the land market.

This study identified that the multidirectional and differential impact of land use regulation on the land market could be assessed by adopting a mixed-methods research design. The complexity of the multiplicity of land market components, multiple areas of the impact assessment and multiple perspectives of the land market stakeholders were managed through the analytic hierarchy process (AHP). The findings were

synthesised with archival records. The land market phenomenon was studied through practical and pluralistic approaches. The integrated approaches revealed stakeholders' perspectives on the impact of land use regulation on the land market. The consequences were viewed across the social, economic, environmental and institutional dimensions with different impact levels. The findings allowed me to confirm the deductive premise (Chapter Four) that the introduction of land use regulation in Nepal impacts the land market across multiple dimensions. The findings further allowed me to confirm that it is possible to assess a land market across the economic, social, environmental and institutional dimensions and that a land market should be assessed from multiple perspectives to understand its broad reaching impact on society. This standpoint resembles perfectly the claim that "There cannot be a general theory of land market.."(Needham et al., 2011, P. 161).

The methods adopted also identified 14 land market impact factors across the economic, social, environmental and institutional dimensions, as discussed in section 5.2.3 and 7.3, and summarised in Tables 7-1 to 7-4.

7.6. Chapter Summary

This chapter discussed and presented a summary of findings from the survey and archival research. The results of the two studies were integrated to confirm the land use regulation's impact on the Nepalese land market. The chapter reviewed the 14 impact factors and discussed how and why they were associated with an impact on the land market across the economic, social, environmental and institutional dimensions. The chapter also confirmed that perceived impact of land use regulation was negative across the economic, social and institutional dimensions and positive across the environmental dimension. The chapter asserted that land use regulation further increased imperfection of the land market and identified five key areas that should be addressed in the land market reform. This chapter addressed the fourth research questions and the fifth research objective.

The chapter also included a discussion on how this research led to testing the 'non-generalisable' theory of the land market. The final chapter will conclude this research by firstly reviewing the initial research questions and stated objectives. The

contribution to the original body of knowledge will then be presented, and recommendations for further research will be outlined.

Chapter 8: Conclusions and Future Research

8.1. Introduction

Effective land use management and efficient land markets form the basis of sustainable development. Governments implement land use regulations to make the best use of land and natural resources for the socio-economic benefit of the people, and to ensure the country's environmental sustainability. While land use regulation aims to improve outcomes in the community, it often has significant impacts on the land market across multiple dimensions.

This research investigated the impact of the land use regulation on the land market in Nepal, adopting a holistic approach. The results of this study re-affirm several factors across economic, social, environmental, and institutional dimensions to be considered in reviewing the impact of land use regulation on the land market. It also confirms the importance of stakeholders' perspectives in identifying the degree and depth of the impact across dimensions and is complemented by documentary evidence and archival records.

This chapter reviews the results achieved during this research, highlights the significance of the research work to theory and practice, reflects on the original research problem, and suggests future research efforts.

8.2. Achievement of Research Aim and Objectives

The central aim of this thesis was:

To identify the impact of land use regulation on the land market in Nepal across the economic, social, environmental and institutional dimensions utilising an integrated approach.

In order to achieve the research aim, a review of the literature was undertaken in Chapter Two. The review explored theoretical foundations of the land use-land market relationship and land market impact assessment practices. A preliminary set of

fourteen land market impact factors were identified through the literature review. Chapter Three presented the review of the existing situation regarding land use regulation and the land market in Nepal. Chapter Four outlined the exploratory mixed-method research design framework for measuring the impact of land use regulation on the land market in Nepal. The framework was then successfully utilised in Chapters Five, Six and Seven. Chapter Five presented the results of the interviews and survey. The stakeholder interviews confirmed the land market impact factors associated with the introduction of land use regulation in Nepal. The survey identified the impact of the regulation on the land market across the economic, social, environmental, and institutional dimensions based on stakeholders' perspectives. Chapter Six examined the impact of land use regulation through documentary evidence and archival records. Chapter Seven presented the synthesis of the findings in Chapters Five and Six and discussed the impact of the findings on the land market in Nepal. The aim of measuring the impact of land use regulation on the land market in Nepal across the economic, social, environmental and institutional dimensions was achieved and key areas for the reform of the land market were identified.

The achievements of the objectives are summarised in the following subsections.

8.2.1. Objective 1: To review the theoretical foundations of the land use-land market relationship, land market assessment practices, and identify the land market impact factors

Chapter Two of this thesis first presented the review of theoretical foundations of land use-land market relationship. The chapter then presented the review of possible impacts of land use regulation on the land market. The review also re-visited the Three Pillar Land Market Model, together with the inter-relationship of land use, land value, and land ownership addressed by the land administration theory. The review found that the complex relationship between diverse land market components and the land market participants requires the assessment of impacts to extend beyond the boundary of land administration theory. The study then explored multiple theoretical underpinnings that could be applied to assess the impact of land use regulation on the land market.

However, none of the theories reviewed were found to address the holistic assessment of the land market as they were limited to specific segments of the land market. So,

no single theory can entirely address the multiple criteria required for the holistic impact assessment. The literature review also found that measuring the impact on the land market of land use regulation could be addressed through a range of methods, but the analytical hierarchy process (AHP) was found to be the most suitable. A review of land market impacts factors identified 14 land market impact factors across the economic, social, environmental, and institutional dimensions through the literature review.

8.2.2. Objective 2: To review the implementation of land use regulation, and prevalent land market structure in Nepal

The achievement of the objective 1 provided the theoretical background for the holistic measurement of the impact of land use regulation on the land market. However, it was essential to understand the particular context of land use regulation and the land market in Nepal to ensure that the selected study area fulfils the basic theoretical and physical requirement for the research by having the land use regulation and operational land market in place. A review of existing practices for implementing land use regulation and the prevalent land market practices in Nepal was carried out in the Chapter Three of this thesis.

It was found that the 'land use – land market' situation in Nepal satisfied the basic necessary conditions required for this research. The presence of the *National Land Use Policy 2012* (amended in 2015), enforcement of land classification, subdivision restrictions and lot size control in 2017, and the *Land Use Act 2019* fulfilled the basic requirement regarding the existence of land use regulation. Implementation of urban development through town planning or land pooling, and flood risk reduction based on the environmental policy, were also found to have been endorsed by the *Land Use Policy 2012/2015* although they were initiated before the introduction of the policy.

The land market in Nepal was observed through the three-pillar model of the land market namely, land valuation system, financial services, and land registration and cadastre. Market participants such as landowners and buyers, financial institutions, land developers, notaries and their professional organisations, and land administration authorities were found to interact at different levels to achieve the market outcome. In Nepal, these actors were participants in the formal land transaction processes through

the Land Revenue and Survey Offices located at each district level throughout the country.

Twenty-five million land parcels recorded in the District Land Revenue Offices across the country were the fundamental land market goods found in Nepal. Financial institutions in Nepal provide mortgage services by taking the land property right as fixed assets collateral. The land market operation was found to be within the legal framework mandated by the *Land Act 1964*, *Land Revenue Act 1978*, and *Land (Survey and Measurement) Act 1963* in Nepal. The *Constitution of Nepal 2015* was found to protect the fundamental rights of the landowners. However, the implementation of the land use policy and enforcement of land use restrictions could have consequences across multiple dimensions and impact the land markets in different directions.

8.2.3. Objective 3: To assess the impact of land use regulation on Nepal's land market through the stakeholders' perspectives

Chapter Five of this thesis presented the impact of land use regulation from a range of different stakeholders' perspectives. This impact assessment was initiated by firstly refining the 14 preliminary impact factors and indicators found in the literature review through stakeholder interviews. A questionnaire survey was then undertaken to collect the ranking of impact factors across the four identified dimensions. The survey collected impact scores to reflect both the depth and direction of impact for each impact indicator. The rank and raw impact scores were processed in AHP to derive a weights-based impact result. The overall results showed that the Nepalese land market stakeholders perceived a positive impact across the environmental dimension and a negative impact across the economic, social, and institutional dimensions.

The overall positive impact across the environmental dimension was due to the perceived environmental improvements associated with flood risk and improved residential land quality in urban land development and land pooling areas. The perceived negative impact across the institutional dimension was due to reduced accessibility to the residential land and a reduction in property rights due to the subdivision restrictions and forced road expansions. Across the economic dimension, inadequate compensation, increased transaction costs, reduced mortgage availability, increased land transfer tax, and increased land price resulted in the negative perception of the impact. Across the social dimension, stakeholders were dissatisfied due to

conflicts caused by the lack of awareness of the land use restrictions and unmet expectations.

8.2.4. Objective 4: Identify the changes in the Nepalese land market as exhibited by documentary evidence and archival records

Chapter Six of this thesis presented the changes in the land market based on documentary evidence and archival records across the economic, social, environmental and institutional dimensions. Those data were collected through government agencies in the form of tables, reports, maps and spatial data, photographs and images. Across the economic dimension, the land values across the sample in the study area experienced an increase of approximately 31% after the introduction of subdivision restrictions in July 2017. The data showed an overall increase in the number of smaller sizes lots (less than 120 Sq. m) but a decrease in the number of subdivisions due to subdivision restrictions. The market also experienced a reduction in mortgage availability. There was a decrease in the fair market value ratio, a decrease in loan-to-value (LTV) ratio, an increase in non-performing loans and the number of blacklisted borrowers. A rise in transaction cost was observed for a transaction requiring subdivisions as the verification requirements for the road and river boundaries and the land use category took two weeks longer on average after the introduction of land use regulation. The market did not experience any change in the rate of transfer tax, however, buyers had to pay more transfer tax due to the increased land value. Inadequate and delayed compensation resulted in the reduction of the financial capacity of landowners who had lost part of their land for road widening.

Across the social dimension, an increase in conflicts and court cases indicated stakeholders' dissatisfaction with the land use regulation. Conflict over the pre-payment for land purchase increased by 14-fold in the study area. The court cases for subdivision of jointly owned parcels cases increased by 36% in the Kathmandu Valley in a one-year period following the introduction of the subdivision restrictions. There was also an increase of 50% in subdivision requests related to divorce cases and property inheritance. Similarly, landowners who were advised to relocate away from hazard areas were found to be dissatisfied with the lack of proximity to their workplace with 50% of dwellers reluctant to relocate.

Across the environmental dimension, results showed a mixed impact on the land market. Private and government-run land development projects supplied environmentally improved residentials plots to the land market. These areas featured greater open space with added road and utility infrastructure compared to the surrounding unplanned areas. Flood mitigation protected approximately 20,000 privately owned parcels from flood risk in unplanned areas. Although the private and government sector contributed by supply of quality plots for residential use, the subdivision restrictions and land classification caused a decline in private land development projects.

Across the institutional dimension, the market was affected by the reduction in the availability of land in the market. The market experienced a reduction in the total transaction volume by 25% and subdivision-based transactions by 62%. The lot size control also reduced the availability of land for subdivision by 80% in the new town development areas of Kathmandu Valley. Landowners were also affected by the road zone expansion and inadequate compensation resulted in an increase in road expansion court cases from seven cases before the land use policy in 2012, to 484 in 2015.

8.2.5. Objective 5: To compare, complement and contrast the perspectives-based impact assessment with the findings of the documentary evidence and archival records.

The synthesis of the stakeholders' perspectives on the impact of land use regulation and the documentary evidence enabled a comparison of the perceived and actual outcomes of land use regulation. Across the economic dimension, perspective-based findings suggested that there was a reduction in the price of the agricultural land because of the implementation of land use regulation. However, the demand curve analysis of transaction price data suggests that there was a 'lot-size effect' on the price of land, indicating an increase in price of small sized parcels, whereas the price was almost stagnant for large parcels. Similarly, the transaction cost was found to increase only in the transactions that required lot subdivision, but not for all types of transactions.

The perspective-based findings suggest the market experienced a reduction in mortgage availability. Documentary evidence identified a high correlation between blacklisted and non-performing loans and the decrease in the mortgage availability

year-on-year. The result complements the stakeholder's perspective that subdivision restrictions did not allow private land developers to sell their developed land, which made them unable to repay their loans. Financial institutions considered this as a risk in investing in the real estate sector which led to a decrease in mortgage availability in the Nepalese real estate and residential housing sectors.

Across the social dimension, an increase in the conflict and court cases due to the lack of awareness of the land classification and subdivision restrictions and landowners' seeking alternative pathways for subdivision approval were unexpected consequences of land use regulation. These results complement with perspective-based negative impact findings across the social dimension.

Across the environmental dimension, the perspective-based findings that the land use regulation improved the environmental situation by supplying quality residential plots is in contrast with the declining number of land development projects in the Kathmandu Valley following the introduction of land use policy and subdivision restrictions. The land pooling projects supplied quality plots in comparison to the surrounding unplanned areas. However, the land use regulation itself reduced the supply of such land because there were insufficient areas of non-agricultural land that could be used for residential purposes.

8.3. Significance of Findings to Other Research

This study reinforced the understanding that a land market can be significantly influenced by changes in the policies and institutional arrangements that support it. Simultaneous observation of the land use, value and ownership model of land administration and the Three Pillar Land Market Model of Dale and McLaughlin (1999) reveals the relationship of land use regulation and land market. Land use regulation in this study is part of the broader policy framework, and changes pertaining to the valuation, mortgage availability, and land supply were some of the land market segments addressed in this study.

Methodologically, this study utilised a mixed methods research approach where the quantitative and qualitative findings were combined for a holistic measurement of impact that went beyond the usual approach of land market assessment based on value or demand and supply aspects of land market (Ihlanfeldt, 2007; Lees, 2018a), or a

descriptive approach followed to identify the customer satisfaction (Tuladhar and van der Molen, 2003). The first phase of this research applied multiple-criteria multi-stakeholders decision-making in identifying the impact factors and then using AHP to produce impact based on stakeholders' perspectives. The first phase applied initially qualitative technique and then quantitative techniques ultimately deriving the impact indices. In the second phase, the quantitative phase, findings were derived through the analysis of documentary evidence. The synthesis of these two phases complemented each other and offers a new approach to land market impact assessment.

Theoretically, this research confirms the non-generalisability characteristics of the land market and implies that the impact of the land use regulation on a land market extends beyond the scope of economic theory to the social, institutional, and environmental dimensions.

Philosophically, this study accepts multiple realities and perceptions which can often lead to contradictions or disagreements depending on the perspective adopted. Improved residential planning was found to bring a positive impact across the environmental dimension but it often increased the land price making it harder to access for the poor. Subdivision restrictions reduced the supply of land, increased the social burden and court cases, but it also reduced the rate of land fragmentation. Property rights violations were raised due to road expansions and the lack of compensation, but this also contributed to improved traffic mobility and contributed to increase land values. Understanding the stakeholders' perspectives was crucial to exploring the realities of the 'land use-land market phenomena' but the perspectives were not consistent across the range of stakeholders' and required documentary evidence to understand the perceived land market outcome. This tendency of 'measurement' entirely is the focus of subjective ontology. Such a phenomenon needs to be studied through practical and pluralistic standpoints and the use of a mixed-methods approach helps to understand the phenomena under study.

This study found that a holistic assessment of the land market needs to address both aspects – the stakeholders' perspective and its grounded relevance. This research introduces a new holistic approach to land market assessment that identifies the degree and direction of impact and confirms the grounded reality. It attempts to add novelty

conceptually, methodologically, philosophically, supporting multiple theoretical underpinnings.

8.4. Policy Implications and Recommendations

The National Land Use Policy 2015 of Nepal sets the goal of achieving sustainable development through its implementation. In this context, the policy implementation was expected to impact the land market across the economic, social, environmental and institutional dimensions by providing a more transparent and orderly process of land use planning and utilisation in the longer term. The research found an overall negative outcome across the economic, social and institutional dimensions and a negligible positive impact across the environmental dimension.

The findings suggest that there is a need for improved coordination at all levels of the government to effectively implement land use regulation in Nepal. The government mandates for the implementation of land use regulation were found to be contradictory between the Land Use Policy 2015 and the Land Use Act 2019. The former assumes the establishment of a land use department at the national level as the main implementation body, whereas the latter devolves power to the local government. This ambiguity needs to be resolved. The implementation authority also needs to ensure the sharing of consistent and uniform land use information among stakeholders to provide certainty of land use zoning.

The findings also suggest that appropriate levels of compensation should be available for the loss caused by the implementation of land use regulation. However, the biggest institutional challenge in respect to compensation in Nepal is the recent constitutional provision (The Constitution of Nepal, Article 25-4,) that rules out the possibility of the compensation in the context of land use implementation and therefore contradicts the fundamental rights of property ownership in Nepal (Government of Nepal, 2015a, Article 25-4). This legal hurdle needs to be addressed. Similarly, the implementing authority needs to ensure stakeholders are aware of the provisions of the new land use planning, associated restrictions and responsibilities. This requires clarity on the implementation process, informing the public about the land use restrictions and to also ensure stakeholders recognise their responsibilities in respect to their future land use and planning decisions.

There is a need to review the conversion of land classified as agricultural land to residential land. While the residential land is essential for settlement purposes, agricultural land needs to be preserved to ensure food security and sustainability for the nation. Consideration should be given to a policy that proactively encourages the landowners to retain agricultural land through the provision of support by reduced taxes, subsidies for fertilisers, enhancing irrigation infrastructure or support to market and distribute agricultural products. The implementing authorities may consider the larger issue of supply and demand of the land resulting from the land use regulation as indicated by significant changes in land value. This may also help to control the land speculation.

In general, the impact of a land use policy implementation on a land market are complex and should be continuously and closely monitored. Addressing the changes and making timely adjustments safeguards the land market from significant negative outcomes across multiple dimensions and supports the achievement of sustainable development.

8.5. Areas for Further Research

The outcomes of this research identified potential for further research that could be directed in the following areas.

8.5.1 Case-specific nature of the land market and the variation of assessment criteria

A land market outcome is a function of socio-cultural settings, institutional arrangements, and the participants across the jurisdiction. The requirements for the realisation of a land market, such as land valuation, land registration and cadastre, financial services, and goods and services are common to many markets at a generic level. However, each market possesses specific characteristics and therefore can be a specific case. The taxonomy adopted in this land market assessment study in terms of impact factors and dimensions may not coincide with other jurisdictions. Therefore, it suggested that further research is warranted in modifying the impact factors and assessment criteria in measuring the impact of use regulation across multiple jurisdictions.

8.5.2. Development of a land market assessment model to compare multiple jurisdictions

This study adopted a new approach for the land market assessment that employed qualitative and quantitative approaches to identify the impact of land use regulation in a specific land market. A land market assessment model that comprises generic impact factors could be developed to compare the impacts on land markets operating in two or more similar jurisdictions.

8.5.3. Holistic versus specific land market assessment

This study identified fourteen impact factors associated with the Nepalese land market and measured the impact holistically across the economic, social, environmental and institutional dimensions. However, the implicit inter-relationship among impact factors may have also impacted the land market outcome. For example, changes in the valuation may affect the mortgage availability or vice versa; changes in taxation may affect transaction volume. Further research may be warranted on the specific impact assessment and their inter-relationship.

8.5.4. Impact on the land market and sustainable development

This study identified changes in the Nepalese land market associated with transaction cost, valuation, taxation, mortgage availability, property rights, accessibility and availability, and stakeholder satisfaction. It also attempted to address changes in the land market associated with the environmental dimension which often conflicted with the other dimensions. The depth and direction of impact is often mixed and, therefore difficult to represent an overall impact on sustainable development through an index. Zevenbergen et al. (2016a) discussed the possibility of 'measuring the change' with respect to the achievement of the Millennium Development Goals (MDGs) in the context of a Responsible Land Administration System (RLAS). Similarly, Zevenbergen et al. (2018) discussed the possibility of measuring the changes with respect to achieving the Sustainable Development Goals (SDGs). Further research could contribute to improved measurement of change through modifying and adopting the impact factors and indicators to address achieving the SDGs.

8.6. Final Remarks

This study has demonstrated that the impact of land use regulation on the land market can be assessed holistically across the economic, social, environmental and institutional dimensions. The combination of quantitative and qualitative findings ensured complementarity and enhanced the understanding of the impact of land use regulation on the land market. The research provided insights to improve the effective operation of the land market and hence improved economic, social, environmental, and institutional outcomes.

Land use regulation is critical to improving the quality and sustainability of our urban environments. Understanding the impact of this regulation on land markets and their stakeholders enables land policy decisions to be better targeted and supports good land governance.

REFERENCES

Acharya, B., 2008, '*Land Tenure and Land Registration in Nepal*', Integrating Generations FIG Working Week 2008 Stockholm, Sweden FIG, pp. 1-13.

Adams, D., 1994, *Urban Planning and the Development Process*, UCL Press, London.

Alexander, E. R., 1992, 'A Transaction Cost Theory of Planning', *Journal of the American Planning Association*, 58 (2), pp. 190-200. https://doi.org/10.1080/01944369208975793.

Alexander, E. R., 2014, 'Land-property Markets and Planning: A Special Case', *Land Use Policy*, 41, pp. 533-540. https://doi.org/10.1016/j.landusepol.2014.04.009.

Alexander, L., Gündüz, C. & Subedi, D. B., 2009, What Role for Business in "Post-Conflict" Economic Recovery? Perspectives from Nepal, International Alert, Kathmandu, Nepal.

Alghamdi, A. H. & Li, Li, 2013, 'Adapting Design-based Research as a Research Methodology in Educational Settings', *International Journal of Education and Research*, 1 (10), pp. 1-12.

Alonso, W., 1960, 'A Theory of the Urban Land Market', *Paper and Proceedings of Regional Science Association*, 6, pp. 149-157. https://doi.org/10.1111/j.1435-5597.1960.tb01710.x

Archer, R. W., 1978, 'Land Pooling for Planned Urban Development in Perth, Western Australia', *Regional Studies*, 12 (4), pp. 397-408. https://doi.org/10.1080/09595237800185351.

Archer, R. W., 1988, 'Land Pooling for Resubdivision and New Subdivision in Western Australia', *The American Journal of Economics and Sociology*, 47 (2), pp. 207-221.

Awasthi, M. K., 2009, 'Dynamics and Resource Use Efficiency of Agricultural Land Sales and Rental Market in India', *Land Use Policy*, 26 (3), pp. 736-743. https://doi.org/10.1016/j.landusepol.2008.10.001.

Bakrania, S., 2015a, *Urban Poverty in Nepal*, GSDRC Helpdesk Research Report 1322 University of Birmingham, UK Retrieved from. http://gsdrc.org/wp-content/uploads/2016/01/HDQ1322.pdf (Accessed 21/08/2021).

Bakrania, S., 2015b, *Urbanisation and Urban Growth in Nepal*, GSDRC Helpdesk Research Report 1322 University of Birmingham, UK Retrieved from. http://www.gsdrc.org/wp-content/uploads/2015/11/HDQ1294.pdf (Accessed 21/07/2021).

Ball, M., 1998, 'Institutions in British Property Research: A Review', *Urban Studies*, 35 (9), pp. 1501-1517. https://org/10.1080/0042098984259.

Banerjee, P., Ghose, M.K. & Pradhan, R., 2018, 'AHP-based Spatial Analysis of Water Quality Impact Assessment due to Change in Vehicular Traffic Caused by Highway Broadening in Sikkim Himalaya', *Applied Water Science*, 8 (2), pp. 72. https://doi.org/10.1007/s13201-018-0699-5.

Banjara, B., 2019, 'Degrading Real Estate Business', *Annapurna Post*, 20/10/2019, p.1, https://epaper.amn.media/annapurnapost-detail/911#gallery-1.

Bennett, R., 2007, 'Property Rights, Restrictions, and Responsibilities: Their Nature, Design, and Management', PhD Thesis, The University of Melbourne.

Bernasconi, M., Choirat, C. & Seri, R., 2010, 'The Analytic Hierarchy Process and the Theory of Measurement', *Management Science*, 56 (4), pp. 699-711. https://doi.org/10.1287/mnsc.1090.1123.

Bertaud, A. & Malpezzi, S., 2001, 'Measuring the Costs and Benefits of Urban Land Use Regulation: A Simple Model with an Application to Malaysia', *Journal of Housing Economics*, 10, pp. 393–418. https://doi.org/10.1006/jhec.2001.0293.

Bhagwat, 2017, Earth's Exploitation, Geeta Press, Gorakhpur, Utaar Pradesh, India, (Accessed 22/08/2021).

Boamah, N. A., Nelson, J. K. B. & Gyimah, C., 2012, 'The Impact of Land Use Regulations on Residential Land Values in the Wa Municipality, Ghana', *Journal of Housing and the Built Environment*, 27 (3), pp. 349-358.

Bolger, F. & Wright, G., 2017, 'Use of Expert Knowledge to Anticipate the Future: Issues, Analysis and Directions', *International Journal of Forecasting*, 33 (1), pp. 230-243. https://doi.org/10.1016/j.ijforecast.2016.11.001.

Boyatzis, R. E., 1998, Transforming Qualitative Information: Thematic Analysis and Code Development,[Online], SAGE Publications, Thousand Oaks, California, https://books.google.com.au/books?id=_rfClWRhIKAC&printsec=frontcover#v=onepage&q&f=false).

Braun, V. & Clarke, V., 2006, 'Using Thematic Analysis in Psychology', *Qualitative Research in Psychology*, 3 (2), pp. 77-101. https://doi.org/10.1191/1478088706qp063oa.

Bryman, A., 2003, *Research Methods and Organisation Studies*, Routledge, Taylor & Francis London.

Burby, R. J. & Dalton, L. C., 1994, 'Plans Can Matter! The Role of Land Use Plans and State Planning Mandates in Limiting the Development of Hazardous Areas', *Public Administration Review*, 54 (3), pp. 229-238. https://doi.org/10.2307/976725.

Burdge, R. J., 1999, *A Conceptual Approach to Social Impact Assessment (Revised Edition) Collection of Writings by Rabel J. Burdge and Colleagues*, Social Ecology Press, Wisconsin.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D. & Walker, K., 2020, 'Purposive Sampling: Complex or Simple? Research Case Examples', *Journal of Research in Nursing*, 25 (8), pp. 652-661. https://doi.org/10.1177/1744987120927206.

Castro, D. M. & Parreiras, F. S., 2018, 'A Review on Multi-Criteria Decision-Making for Energy Efficiency in Automotive Engineering', *Applied Computing and Informatics*, pp. 53-78. https://doi.org/10.1016/j.aci.2018.04.004.

CBS, 2012, National Population and Housing Census 2011: National Report, Kathmandu, Nepal.

CBS, 2017, Statistical Year Book, Central Bureau of Statistics, Kathmandu, Nepal.

CBS, 2018, Statistical Year Book 2018, Central Bureau of Statistics, Kathmandu, Nepal.

CBS, 2021, Today's Population of Nepal [Online]. Central Bureau of Statistics, Kathmandu, Nepal, Published by Government of Nepal. www.cbs.gov.np (Accessed 05/05/2021).

Chand, B. J. K., 2019, 'Land Management Problems in Nepal: Repercussions of Land Use Policy and Implementation Gaps in Regional and Urban Planning', *ISPRS Annals of Photogrammetry, Remote Sensing and Spatial Information Sciences*, IV-5/W2, pp. 17-24. 10.5194/isprs-annals-IV-5-W2-17-2019.

Chapagain, D., 2018, 'Present Situation of Urbanisation in Nepal', *International Journal of Humanities Social Sciences and Education (IJHSSE)*, 5 (12), pp. 170-175. http://dx.doi.org/10.20431/2349-0381.0512017.

Cheshire, P., 2018, 'Broken Market or Broken Policy? The Unintended Consequences of Restrictive Planning. ', *National Institute Economic Review*, 245 (1), pp. 1-20. https://doi.org/10.1177/002795011824500111.

Cheshire, P. & Hilber, C., 2011, 'Land Use Planning: The Damaging Impact on Retail Productivity', *London School of Economics and Political Science, CenterPiece Article*, pp. 25-28.

Cheshire, P. & Sheppard, S., 2002, 'The Welfare Economics of Land Use Planning', *Journal of Urban Economics*, 52 (2), pp. 242-269. https://doi.org/10.1016/S0094-1190(02)00003-7.

Cheshire, P. & Vermeulen, W., 2009, 'Land Markets and Their Regulation: The Welfare Economics of Planning' in Geyer, H. (ed.), *International Handbook of Urban Policy*, pp. 151-193, Edward Elgar Publishing, Cheltenham, UK.

Chirkov, V. & Anderson, J., 2018, 'Statistical Positivism Versus Critical Scientific Realism. A Comparison of Two Paradigms for Motivation Research: Part 2. A Philosophical and Empirical Analysis of Critical Scientific Realism', *Theory & Psychology*, 28 (6), pp. 737-756. https://doi.org/10.1177/0959354318816829.

Ciaian, P., Kancs, d'A., Swinnen, J., Van Herck, K. & Vranken, L., 2012, *Institutional Factors Affecting Agricultural Land Markets, Factor Markets, Working Paper*, Centre for European Policy Studies (CEPS) (16). https://www.ceps.eu/ceps-publications/institutional-factors-affecting-agricultural-land-markets/ (Accessed c22/08/2021).

Commission for the Investigation of Abuse of Authority, 2020, Directives Regarding the Restriction on the Subdivision of Agricultural Land, [Online], p. 2, http://www.ciaa.gov.np/pressrelease/1725 (Accessed 22/08/2021).

Copenheaver, C. A., Kidd, K. R., Shockey, D. M. & Stephens, B. A. , 2014, 'Environmental and Social Factors Influencing the Price of Land in Southwestern Virginia, USA, 1786–1830', *Mountain Research and Development*, 34 (4), pp. 386-395.

Courant, P.N., 1976, 'On the Effect of Fiscal Zoning on Land and Housing Values', *Journal of Urban Economics*, 3, pp. 88-94.

Crane, A. & Ruebottom, T., 2011, 'Stakeholder Theory and Social Identity: Rethinking Stakeholder Identification', *Journal of Business Ethics*, 102 (1), pp. 77-87. https://doi.org/10.1007/s10551-011-1191-4.

Creswell, J. W., 2012, *Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, Smith, P. A., Fourth Edition, Pearson, University of Nebraska Daulat Purnama.

Creswell, J. W., 2014, *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, Fourth Edition, SAGE Publications, Thousand Oaks, California.

Creswell, J. W., 2018, *Designing and Conducting Mixed Methods Research*, Third Edition, SAGE Publications, Thousand Oaks, California.

Creswell, J. W. & Plano, C. V. L., 2007, 'Choosing a Mixed Methods Design' in (ed.), *Designing and Conducting Miixed Methods Research*, First Edition, pp. 53 - 107, SAGE, Thousand Oaks, California.

Creswell, J. W. & Plano, C. V. L., 2011, 'Choosing a Mixed Methods Design' in (ed.), *Designing and Conducting Mixed Methods Research*, Second Edition, pp. 53-106, SAGE Publications, Thousand Oaks, California.

Crotty, M., 1998, *The Foundations of Social Research: Meaning and Perspective in the Research Process*, SAGE Publications, Thousand Oaks, California.

Dahal, M. K., 2011, 'Taxation in Nepal: Structure, Issues and Reforms', *Economic Journal of Nepal*, 32 (1), pp. 1-13.

Dahal, P., 2014, 'The Impact of Remittances on Economic Growth in Nepal: an Analysis of a Significant Basis of Development', *Asia Pacific Journal of Public Administration*, 36 (4), pp. 261-282. https://doi.org/10.1080/23276665.2014.975908.

Dahal, R. K., Hasegawa, S., Nonomura, A., Yamanaka, M., Dhakal, S. & Paudyal, P., 2008, 'Predictive Modelling of Rainfall-Induced Landslide Hazard in the Lesser Himalaya of Nepal based on Weights-of-Evidence', *Geomorphology*, 102 (3), pp. 496-510. https://doi.org/10.1016/j.geomorph.2008.05.041.

Dakshinkali Municipality, 2018, *Financial Act of Dakshinkali Municipality*, Local Government, Dakshinkali Municipality, Kathmandu, Nepal.

Dale, P. & Baldwin, R., 2000, '*Lessons from the Emerging Land Markets in Central and Eastern Europe*', Quo Vadis: International Conference Proceedings, FIG Working Week, 21-26 May, 2000, Prague, Chez Republic, FIG, pp. 1-36.

Dale, P. F. & McLaughlin, J. D., 1999, *Land Administration*, Oxford University Press.

Dale, P., Mahoney, R. & McLaren, R., 2006, Land Markets and the Modern Economy, RICS.

Dawadi, U., 2018, 'Assessment of Potential Impact on Land Market due to Implementation of Land Use Planning', MSc Thesis, Kathmandu University, Dhulikhel.

de Sherbinin, A., Carr, D., Cassels, S. & Jiang, L., 2007, 'Population and Environment', *Annual Review of Environment and Resources*, 32, pp. 345-373. https://doi.org/10.1146/annurev.energy.32.041306.100243.

de Soto, H, 2000, *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere*, Black Swan Edition, Black Swan, London, 2001.

de Vries, W. T., 2021, '*Testing and Improving the 8R Framework of Responsible Land Management to Assess Major Land Interventions*', FIG e-Working Week 2021 Smart Surveyors for Land and Water Management-Challenges in a New Reality, pp. 13p.

de Vries, W. T. & Chigbu, U. E., 2017, 'Responsible Land Management-Concept and Application in a Territorial Rural Context', *Fub –Flächenmanagement und Bodenordnung*, 79 (2), pp. 65-73.

Deininger, K., 2003, Land Policies for Growth and Poverty Reduction, World Bank, Washington DC.

Deininger, K., Augustinus, C., Enemark, S. & Munro-Faure, P., 2010, Innovations in Land Rights Recognition, Administration, and Governance. , World Bank Study, World Bank.

Delgado, A., Reyes, H., Romero, I. & Mancilla, C., 2019, *Social Impact Assessment Using the Grey Clustering Method: A Case Study on a Mining Project*, 2019 IEEE Colombian Conference on Applications in Computational Intelligence 5-7 June, 2019, Barranquilla, Colombia, pp. 1-5. https://doi.org/10.1109/ColCACI.2019.8781983 (Accessed 22/08/2021).

Denzin, N. K. & Lincoln, Y. S., 2011, *The Sage Handbook of Qualitative Research*, Third Edition, SAGE Publications, Thousand Oaks, California.

Department of Foreign Employment, 2020, Nepal Labour Migration Report 2020, Ministry of Labour, Employment and Social Security, Nepal.

Department of Water Induced Disaster Prevention, 2009, The Preparation of Flood Risk and Vulnerability Map of the Kathmandu Valley, Department of Water Induced Disaster and Prevention, Kathmandu Nepal.

Dey, P. K., 2002, 'Application of Analytic Hierarchy Process to Benchmarking of Project Management Performance: An Application in the Caribbean Public

Sector', *Vikalpa*, 27 (2), pp. 29-48. https://doi.org/10.1177/0256090920020204.
Dincer, O., 2007, 'The Effects of Property Rights on Economic Performance', *Applied Economics*, 39 (7), pp. 825-837. https://doi.org/10.1080/00036840500461964.
Dirgasova, K., Bandlerova, A. & Lazikova, J., 2017, 'Factors Affecting the Price of Agricultural Land in Slovakia', *Journal of Central European Agriculture*, 18 (2), pp. 291-304. https://doi.org/10.5513/JCEA01/18.2.1901
Displacement Solutions, 2019, Lessons Learned From Post-Earthquake Policy in Nepal, United Kingdom.
Dowall, D. E., 1995, *The Land Market Assessment: A New Tool for Urban Management*, Urban Management Programme Discussion Paper UMPP no. 4 Washington, D.C., World Bank Group, pp. 68. http://documents.worldbank.org/curated/en/296941468764366469/The-land-market-assessment-a-new-tool-for-urban-management (Accessed 22/07/2021).
Dowall, E. D., 1992, 'Benefits of Minimal Land-Use Regulations in Developing Countries', *Carto Journal*, 12 (2), pp. 413-423.
Ekanayake, Athula, 2015, 'Validity and Reliability in Case Study Research in Accounting: A Review and Experience', *Modern Sri Lanka Studies*, V, pp. 161-185.
El-Barmelgy, M. M., Shalaby, A. M., Nassar, U. A. & Ali, S. M., 2014, 'Economic Land Use Theory and Land Value in Value Model', *International Journal of Economics and Statistics*, 2 (1), pp. 91-98.
Enemark, S., 2004, '*Building Land Information Policies* ', Inter-regional Special Forum on The Building of Land Information Policies in the Americas 26–27 October, Aguascalientes, Mexico, pp. 1-20.
Enemark, S., 2005, '*The Land Management Paradigm for Institutional Development* ', In Expert Group Meeting on Incorporating Sustainable Development Objectives into ICT Enabled Land Administration Systems, 9–11 November, Centre for Spatial Data Infrastructures and Land Administration, University of Melbourne, Australia, pp. 1-14.
Enemark, S., 2009, *Sustainable Land Administration Infrastructures to Support Natural Disaster Prevention and Management*, 9th United Nations Regional Cartographic Conference for the Americas, 10-14 August, New York, pp. 1-16. https://unstats.un.org/unsd/geoinfo/RCC/docs/rcca9/ip/9th_UNRCCA_econf.99_IP6.pdf (Accessed 17/05/2021).
Enemark, S., 2009a, '*Land Administration Systems - Managing Rights, Restrictions and Responsibilities in Land*', Map World Forum, 10-13 February, Hyedrabad, India, pp. 1-18.
Enemark, S., Bell, K. C., Lemmen, C. & McLaren, R., 2014, *Fit-for-Purpose Land Administration*, International Federation of Surveyors.
Etikan, I., Musa, S. A. & Alkassim, R. S., 2015, 'Comparison of Convenience Sampling and Purposive Sampling', *American Journal of Theoretical and Applied Statistics*, 5 (1), pp. 1-4.
Etikan, I., Musa, S. A. & Alkassim, R. S., 2016, 'Comparison of Convenience Sampling and Purposive Sampling', *American Journal of Theoretical and Applied Statistics*, 5, pp. 1-4. https://doi.org/10.11648/j.ajtas.20160501.11.
FAO, 1993, Guidelines for Land-use Planning,[Online], Food and Agriculture Organisation of the United Nations, Rome, Italy,

http://www.fao.org/3/T0715E/t0715e00.htm#Contents (Accessed 03/01/2021).

Faust, A., Castro-Wooldridge, V., Chitrakar, B. & Pradhan, P., 2020, *Land Pooling in Nepal*, Asian Development Bank 72 (72). https://www.adb.org/publications/land-pooling-nepal (Accessed 08/08/2021).

Ferreira, L. D. & Merchant, K. A., 1992, 'Field Research in Management Accounting and Control: a Review and Evaluation', *Accounting, Auditing & Accountability Journal*, 5 (4), pp. 1-32.

Food and Agriculture Organisation of the United Nations (FAO), 2012, *Voluntary Guidelines on the Responsible Governance of Tenure of Land Security in the Context of National Food Security*. http://www.fao.org/3/i2801e/i2801e.pdf (Accessed 14/08/2021).

Freedman, B., 2018, *Environmental Science: A Canadian Perspective*, Dalhousie University Libraries Digital Editions, Halifax, NS, Canada.

Freeman, R. E., 2010, *Strategic Management: A Stakeholder Approach*, Cambridge University Press.

Fusch, P., Fusch, G. E. & Ness, L. R., 2018, 'Denzin's Paradigm Shift: Revisiting Triangulation in Qualitative Research', *Journal of Social Change*, 10 (1), pp. 19-32. https://doi.org/10.5590/JOSC.2018.10.1.02.

Fusong, Z. & Zhaofeng, D., 2010, '*Research on Grey Cluster Evaluation Model and its Application of University Core Competence*', Proceedings of the 7th International Conference on Innovation & Management, Wuhan, Hubei, China, pp. 1828-1832.

Ghimire, G., 2015, 'Assessing the Impact of Labour Migration on Land use Change: A Case of Nepal', MSc Research, Kathmandu University, Dhulikhel.

Ghimire, S., Tuladhar, A. & Sharma, S. R. , 2015, '*Land Valuation and Management Issues in Nepal*', FIG – ISPRS workshop, 2015: International Workshop on Strengthening Opportunity for Professional Development & Spatial Data Infrastructure Development, 25-27 November, 2015, Kathmandu, Nepal, FIG, pp. 1-10.

Gilgun, J. F., 2013, 'Grounded Theory, Deductive Qualitiative Analysis and Social Work Resesarch and Practie' in Fortune, A. E., Reid, W. J. & Miller Jr, R. L. (ed.), *Qualitative Research in Social Work*, Second Edition, pp. 107-135, Columbia University Press, New York.

Given, L. M., 2008, *The Sage Encyclopedia of Qalitative Research Methods*, SAGE Publications, Thousands Oak, California.

Glaeser, E. L. & Ward, B. A., 2009, 'The Cause and Consequences of Land Use Regulation: Evidence from Greater Boston', *Journal of Urban Economics*, 65 (2), pp. 265-278. https://doi.org/10.1016/j.jue.2008.06.003.

Godawari Municipality, 2018, *Financial Act of Godawari Municipality*, Local Government, Godawari Municipality, Lalitpur, Nepal.

Godschalk, D. R., 2004, 'Land Use Planning Challenges: Coping with Conflicts in Visions of Sustainable Development and Livable Communities', *Journal of the American Planning Association*, 70 (1), pp. 5-13. https://doi.org/10.1080/01944360408976334.

Goel, A., Ganesh, L. S. & Kaur, A., 2019, 'Deductive Content Analysis of Research on Sustainable Construction in India: Current Progress and Future Directions', *Journal of Cleaner Production*, 226, pp. 142-158. https://doi.org/10.1016/j.jclepro.2019.03.314.

Government of Nepal, 2007, *National Urban Policy 2007*, Government of Nepal.

Government of Nepal, 2008, *Good Governance (Management and Operation) Act, 2064 (2008)* Government of Nepal.
Government of Nepal, 2012, *National Land Use Policy 2012*, Ministry of Land Reform and Management, Government of Nepal.
Government of Nepal, 2015a, *Constitution of Nepal 2016*, Government of Nepal.
Government of Nepal, 2015b, *Land Use Policy 2015*, Government of Nepal.
Government of Nepal, 2017a, *Historical Overview of Nepal*, Ministry of Foreign Affaris, Government of Nepal.
Government of Nepal, 2017b, *Ministerial Decree on the Subdivision of Agricultural Land*, Ministry of Land Reform and Management, Government of Nepal.
Government of Nepal, 2018a, Improved Seeds for Farmers Programme (ISFP), Ministry of Agriculture and Livestock Development Nepal, Kathmandu.
Government of Nepal, 2018b, *An Introduction to Nepal*, 6th Edition, Department of Information and Publication- Ministry of Communication and Information Technology, Tilganga, Kathmandu, Nepal.
Government of Nepal, 2019, *Land Use Act 2019*, Government of Nepal.
Government of Nepal. 2020, Administrative Map of Nepal, 1:1000000. Survey Department, Kathmandu, Nepal.
Grover, R., Törhönen, M.-P., Palmer, D. & Munro-Faure, P., 2007, *Good Governance in Land Tenure and Administration*, Food & Agriculture Organisation, Rome, Italy.
Grover, V. & Malhotra, M.K., 2001, 'Transaction Cost Framework in Operations and Supply Chain Management Research: Theory and Measurement', *Journal of Operation Management*, 21, pp. 457-473.
Gunatilake, H., Wijayatunga, P. & Roland-Holst, D., 2020, *Hydropower Development and Economic Growth in Nepal*. https://www.adb.org/sites/default/files/publication/612641/hydropower-development-economic-growth-nepal.pdf (Accessed 02/05/2021).
Gysin, F., 2004, 'From Modernism to Postmodernism: Black Literature at the Crossroads' in Graham, M. (ed.), *The Cambridge Companion to the African American Novel*, 1st Edition, pp. 139-155, Cambridge University Press, Cambridge, UK.
Healy, M. J. & Perry, C., 2000, 'Comprehensive Criteria to Judge Validity and Reliability of Qualitative Research Within the Realism Paradigm', *Qualitative Market Research: An International Journal*, 3 (3), pp. 118-126.
Himalayan News Service, 2016, 'Agriculture Loans Under Interest Rate Subsidy Programme Increase', *The Himalayan Times, Himalayn News Service*, 27/07/2016, p.11, https://thehimalayantimes.com/business/agriculture-loans-interest-rate-subsidy-programme-increase.
Himalayan News Service, 2017, 'Decision to Restrict Plotting of Arable Land Rescinded by SC', *The Himalayan Times, Himalayn News Service*, 25/08/2017, p.11, https://thehimalayantimes.com/business/decision-to-restrict-plotting-of-arable-land-rescinded-by-supreme-court/.
Himalayan News Service, 2019, 'Supreme Court Verdict to Escalate Cost of Road Expansion Projects', *The Himalayan Times*, 23/03/2019, p.1, http://origin.misc.pagesuite.com/pdfdownload/685f6048-117e-4e80-bef0-6c3b4b14860c.pdf.
His Majesty's Government of Nepal, 1963, *Land (Survey and Measurement) Act 1963*, His Majesty's Government of Nepal.

His Majesty's Government of Nepal, 1964, *Land Act 1964*, His Majesty's Government of Nepal.
His Majesty's Government of Nepal, 1978, *Land Revenue Act 1978*, His Majesty's Government of Nepal.
His Majesty's Government of Nepal, 1987, *Land Acquisition Act 1987*, His Majesty's Government of Nepal.
Honkala, S., Hämäläinen, M. & Salonen, M., 2007, '*Comparison of Four Existing Concept Selection Methods*', In Bocquet, J. C., ed. Proceedings of ICED 2007, the 16th International Conference on Engineering Design, July 28-31, 2007, Paris, France, The Design Scoiety, pp. 11.
Howard, J. A. & Sheth, N. J., 1969, 'The Theory of Buyer Behavior', *Journal of the American Statistical Association*, pp. 467-487. https://doi.org/10.2307/2284311.
Hubacek, K., 2002, *The Economics of Land Use Change*, International Institute for Applied Systems Analysis, Laxenburg, Austria. http://pure.iiasa.ac.at/id/eprint/6748/1/IR-02-037.pdf (Accessed 08/12/2020).
Ihlanfeldt, K. R., 2007, 'The Effect of Land Use Regulation on Housing and Land Prices', *Journal of Urban Economics*, 61 (3), pp. 420-435. http://dx.doi.org/10.1016/j.jue.2006.09.003.
Jackson, R., Fitzpatrick, D. & Singh, P. M., 2016, *Ensuring Equality in Land Rights and Reconstruction in Nepal* Oxfam 1 (1). https://oi-files-d8-prod.s3.eu-west-2.amazonaws.com/s3fs-public/file_attachments/bp-building-back-right-nepal-210416-en.pdf (Accessed 19/07/2021).
Jacobs, A. & Appleyard, D., 1987, 'Toward an Urban Design Manifesto', *Journal of the American Planning Association*, 53 (1), pp. 112-120. https://doi.org/10.1080/01944368708976642.
Jacobs, H. M., 2010, 'Social Conflict Over Property Rights: The End, a New Beginning, or a Continuing Debate?', *Housing Policy Debate*, 20 (3), pp. 329-349. https://doi.org/10.1080/10511481003788760.
Jaeger, W. K., 2006, 'The Effects of Land-Use Regulations on Property Values', *Environmental Law*, 36 (1), pp. 105-130.
Joshi, B., 2012, 'Nepalese Squatters Evicted from Illegal Houses in Kathmandu – in Pictures', *The Gurdian*, https://www.theguardian.com/world/gallery/2012/may/08/nepal-squatters-evicted-kathmandu.
Joshi, P. S., 2015, 'Settling the Issue of Informal Settlements on a Win-Win Framework' in (ed.), *Sankalpa*, pp. 163-170, Kathmandu Valley Development Authority, Kathmandu
Jung , E. & Yoon, H., 2018, 'Is Flood Risk Capitalized into Real Estate Market Value? A Mahalanobis-Metric Matching Approach to the Housing Market in Gyeonggi, South Korea', *Sustainability*, 10 (4008), pp. 1-17. https://doi.org/10.3390/su10114008.
Kamat, R. K., 2019, 'Govt Can't Acquire Private Land Without Compensation: SC ', *The Himalayan Times*, 27/09/2019, p.2, http://origin.misc.pagesuite.com/pdfdownload/e1147023-e168-41e5-8381-c69bc886e5ad.pdf.
Karki, T. K., 2004, 'Implementation Experiences of Land Pooling Projects in Kathmandu Valley', *Habitat International*, 28 (1), pp. 67-88. https://doi.org/10.1016/S0197-3975(02)00085-1.

Kasanga, R. Kasim, Cochrane, Jeffrey A., King, Rudith & Roth, Michael J., 1996, Land Markets and Legal Contradictions in the Peri-Urban Area of Accra Ghana: Informants Interview and Secondary Data Investigations https://doi.org.10.22004/ag.econ.12747

Kathmandu Valley Development Authority, 2015a, *Commitment: Reflections and Revelations*, Ministry of Urban Development, Kathmandu, Nepal.

Kathmandu Valley Development Authority, 2015b, Support to Develop Risk Sensitive Land Use Plan (RSLUP) and Building Bye-Laws of Kathmandu Valley, Kathmandu, Nepal. UNDP/RFP/013/2014

Kathmandu Valley Development Authority, 2017, *A Notice on Changes on Land Subdivison and Physical Condition of Land*, Independent Government Authority.

Kathmandu Valley Development Authority, 2019, Prices of Land Pooling Area in Kathmandu Valley, Kathmandu Valley Development Authority,, Kathmandu, Nepal.

KC, B., Wang, T. & Gentle, P., 2017, 'Internal Migration and Land Use and Land Cover Changes in the Middle Mountains of Nepal', *Mountain Research and Development*, 37 (4), pp. 446-455. https://doi.org/10.1659/MRD-JOURNAL-D-17-00027.1.

Keith, S., McAuslan, Patrick, Knight, Rachael, Lindsay, Jonathon, Munro-Faure, Paul, Palmer, David & Spannenberg, L, 2008, 'Compulsory acquisition of land and compensation', *FAO Land Tenure Studies*, 10, pp.

Khadka, S., 2015, 'Public Accountability in Urban Development' in Shrestha, U. S., Sharma, R. P. & Shrestha, J. (ed.), *Commitment: Reflections and Revelations*, pp. 23-26, Ministry of Urban Development, Kathmandu, Nepal.

Khanal, P., Gurung, A. & Chand, P. B., 2017, 'Road Expansion and Urban Highways: Consequences Outweigh Benefits in Kathmandu', *Himalaya, The Journal of Association for Nepal and Himalayan Studies*, 37 (1), pp. 107-116.

Kharel, S., 2017, 'House Owners Decry Delay in Compensation Distribution', *The Kathmandu Post*, 16/04/2019, https://kathmandupost.com/valley/2014/03/12/house-owners-decry-delay-in-compensation-distribution.

Khatakho, R., Gautam, D., Aryal, K. R., Pandey, V. P., Rupakhety, R., Lamichhane, S., Liu, Yi-C., Abdouli, K., Talchabhadel, R., Thapa, B. R., et al., 2021, 'Multi-Hazard Risk Assessment of Kathmandu Valley, Nepal', *Sustainability*, 13 (10), pp. 1-27. https://doi.org/10.3390/su13105369.

Kihn, Lili-Anne & Ihantola, Eeva-Mari, 2015, 'Approaches to validation and evaluation in qualitative studies of management accounting', *Qualitative Research in Accounting & Management*, 12 (3), pp. 230-255. https://doi.org/10.1108/QRAM-03-2013-0012.

Kirby, A., 2006, 'The Death of Postmodernism and Beyond', *Philosophy Now*, 58, pp. 34-37.

Kivunja, C. & Kuyini, A. B., 2017, 'Understanding and Applying Research Paradigms in Educational Contexts', *International Journal of Higher Education*, 6 (5), pp. 26-41.

Knapik, Mirjam, 2006, 'The Qualitative Research Interview: Participants' Responsive Participation in Knowledge Making', *International Journal of Qualitative Methods*, 5 (3), pp. 77-93. https://doi.org/10.1177/160940690600500308.

Koirala, P. K., 2015, 'Urbanisation in Kathmandu Valley, Legal situation and Way Forward' in Shrestha, U. S., Sharma, R. P. & Shrestha, J. (ed.), *Commitment:*

Reflections and Revelations, pp. 88-94, Ministy of Urban Development, Kathmandu, Nepal.

Koroso., N. H., 2011, 'Assessment of Urban Land Market from Good Governance Perspective -Thesis', International Institute for Geo-Information Science and Earth Observation (ITC), The Netherlands, Enschede, The Netherlands.

Lees, K., 2017, Quantifying the Impact of Land Use Regulation: Evidence from New Zealand, Superu.

Lees, K., 2018a, 'Quantifying the Costs of Land Use Regulation: Evidence from New Zealand', *New Zealand Economic Papers*, pp. 1-25. https://doi.org/10.1080/00779954.2018.1473470.

Lees, K., 2018b, 'Quantifying the impact of land use regulation: Evidence from New Zealand', *New Zealand Economic Papers*, pp. 1-25. https://doi.org/10.1080/00779954.2018.1473470.

Leventon, J., Fleskens, L., Claringbould, H., Schwilch, G. & Hessel, R., 2016, 'An Applied Methodology for Stakeholder Identification in Transdisciplinary Research', *Sustainability Science*, 11 (5), pp. 763-775. https://doi.org/10.1007/s11625-016-0385-1.

Lillis, A. M., 1999, 'A Framework for the Analysis of Interview Data from Multiple Field Research Sites', *Accounting & Finance*, 39 (1), pp. 79-105. https://doi.org/10.1111/1467-629X.00018.

Lima, R. C. de A. & Silveira Neto, R. da M., 2019, 'Zoning Ordinances and the Housing Market in Developing Countries: Evidence from Brazilian Municipalities', *Journal of Housing Economics*, 46, pp. 1-15. https://doi.org/10.1016/j.jhe.2019.101653.

Lindblom, C. E. , 2001, *The Market System: What It Is, How It Works, and What to Make of It*, Yale University Press, New Haven, United States of America.

Lodin, M., Sonila, J. & Onsrud, H., 2015, *Key Factors for Success in Land Administration Projects – Lessons Learned from Projects in South-East Europe*, Linking Land Tenure and Use for Shared Prosperity, 23-27, March 2015, The World Bank, Washington DC, pp. 1-8. https://www.kartverket.no/globalassets/om-kartverket/centre-for-property-rights/wb-2015-paper-684-onsrud.pdf (Accessed 06/07/2021).

Loxton, E. A., Schirmer, J. & Kanowski, P., 2013, 'Exploring the Social Dimensions and Complexity of Cumulative Impacts: A Case Study of Forest Policy Changes in Western Australia', *Impact Assessment and Project Appraisal*, 31 (1), pp. 52-63. https://doi.org/10.1080/14615517.2012.755353.

Luca, L., 2014a, 'Romanian Land Market Regulatory Framework: the Legislative Correction in 2014', *Agricultural Economics and Rural Development*, XI (2), pp. 203-212.

Luca, L., 2014b, 'Romanian Land Market Regulatory Framework: The Legislative Corrections in 2014', *Agricultural Economics and Rural Development*, 11 (2), pp. 203-212.

Macharis, C. & Crompvoets, J., 2014, 'A Stakeholder-based Assessment Framework Applied to Evaluate Development Scenarios for the Spatial Data Infrastructure for Flanders', *Computers, Environment and Urban Systems*, 46, pp. 45-56. https://doi.org/10.1016/j.compenvurbsys.2014.04.001.

Manandhar, K. & Subedi, N. R., 2019, '*Assessment of Land Use Planning from Disaster Management Perspective: A Case of Bara, Nepal*', International Conference on Earthquake Engineering and Post Disaster Reconstruction

Planning, 25 – 27 April, 2019, Bhaktapur, Nepal, Khwopa Engineering College & Khwopa College of Engineering, pp. 396-405.

Mangioni, V., 2014, *Modernising Compensation Principles for the Regeneration of Land Uses in Highly Urbanised Locations*, FIG Congress 2014. https://www.fig.net/resources/proceedings/fig_proceedings/fig2014/papers/ts01f/TS01F_mangioni_6844.pdf (Accessed 18/05/2019).

Mathema, A. S., 1999, *Housing and Land Markets in Kathmandu, Nepal*, Mathema, AS. https://www.semanticscholar.org/paper/HOUSING-AND-LAND-MARKETS-IN-KATHMANDU-%2C-NEPAL-Mathema/5e513d569f186700ed002184b7571cce0d7ccd54 (Accessed 22/08/2021).

Mayer, C. J. & Somerville, C. T., 2000, 'Land Use Regulation and New Construction', *Regional Science and Urban Economics*, 30 (6), pp. 639-662. https://doi.org/10.1016/S0166-0462(00)00055-7.

McCann, L., 2013, 'Transaction Costs and Environmental Policy Design', *Ecological Economics*, 88, pp. 253-262.

McDougall, K., Rajabifard, A. & Williamson, I., 2007, 'A Mixed-Method Approach for Evaluating Spatial Data Sharing Partnerships for Spatial Data Infrastructure Development' in Onsrud, H. (ed.), *Research and Theory in Advancing Spatial Data Infrastructure Concepts*, pp. 55-73, ESRI Press, Redlands, California. .

McKinnon, J., 1988, 'Reliability and Validity in Field Research: Some Strategies and Tactics', *Accounting, Auditing & Accountability Journal*, 1 (1), pp. 34-54. https://doi.org/10.1108/EUM0000000004619.

Melnikovas, A., 2018, 'Towards an Explicit Research Methodology: Adapting Research Onion Model for Futures Studies', *Journal of Futures Studies*, 23, pp. 29-44. https://doi.org/10.6531/JFS.201812_23(2).0003.

Metternicht, G., 2017, Land Use Planning,[Online], United Nations Convention to Combat Desertification (UNCCD), https://knowledge.unccd.int/sites/default/files/2018-06/6.%20Land%2BUse%2BPlanning%2B__G_Metternicht.pdf (Accessed 03/08/2021).

Miles, M. B. & Huberman, A. M., 1994, *Qualitative Data Analysis*, SAGE Publications, Thousands Oak, California.

Miljkovic, J. Z. & Vesna, P., 2014, 'Land use regulation and property rights regime over land in Serbia', *Spatium*, 32, pp. 22-27. https://doi.org/10.2298/SPAT1432022Z.

Mills, A. & Mills, J., 2018. Archival Research. The SAGE Handbook of Qualitative Business and Management Research Methods: Methods and Challenges. London: SAGE Publications.

Ministry of Finance, 2020, Economic Survey, Government of Nepal, Kathmandu, Nepal.

Ministry of Home Affairs, 2017, Nepal Disaster Report 2017, Government of Nepal, Kathmandu.

Ministry of Home Affairs, 2019, Nepal Disaster Report 2019, Government of Nepal, Kathmandu.

Ministry of Land Management Cooperatives and Poverty Alleviation, 2019, A Brief Introduction to the Ministry of Land Managment, Cooperatives and Poverty Alleviation, and its Umbrella Organisations: Annual Report, Fiscal Year 2018/2019, Ministry of Land Management Cooperatives and Poverty Alleviation, Kathmandu, Nepal.

Ministry of Land Reform and Management, 2012a, *A Brief Introduction to the Ministry of Land Reform and Management and its Umbrella Organisations: Annual Report*, Fiscal Year 2011/2012, Ministry of Land Management, C. a. P. A., Kathmandu, Nepal.

Ministry of Land Reform and Management, 2012b, *Directives for the Distribution, Use and Regulation of Digital Data* Government of Nepal.

Ministry of Land Reform and Management, 2013, *Land Use Program Implementation Directive (Bhu-Upayog Nirdeshika)*, National Land Use Project, Government of Nepal.

Mitchell, D., Sait, S., Du Plessis, J. & Mwasumbi, A., 2019, *Core Values and Principles of Responsible Land Administration A Structured Knowledge Base*, FIG Working Week 2020 Smart Surveyors for Land and Water Management, Amsterdam, the Netherlands, 10–14 May 2020, pp. 1-65. (Accessed 07/06/2021).

Mitchell, D., Sait, S., Du Plessis, J. & Todorovski, D., 2017, *Towards a Responsible Land Administration Curriculum*, FIG Working Week 2017: Surveying the World of Tomorrow-From Digitalisation to Augmented Reality, May 29–June 2, 2017, Helsinki, Finland, pp. 1-18. (Accessed 21/08/2021).

Mitchell, R. K. & Lee, J. H., 2019, 'Stakeholder Identification and its Importance in the Value Creating System of Stakeholder Work' in Harrison, J. S., Barney, J. B., Freeman, R. E. & Phillips, R. A. (ed.), *The Cambridge Handbook of Stakeholder Theory*, pp. 53-74, Cambridge University Press, Cambridge, UK.

Monkkonen, P. & Ronconi, L., 2013, 'Land Use Regulations, Compliance and Land Markets in Argentina', *Urban Studies*, 50 (10), pp. 1951-1969. https://doi.org/10.1177/0042098012471982.

Monkkonen, P., Zhang, Y. & Comandon, A. R. L., 2020, *Urban Land and Housing Market Assessment: A Toolkit (English)*, World Bank Group. http://documents.worldbank.org/curated/en/922921600345178886/Urban-Land-and-Housing-Market-Assessment-A-Toolkit (Accessed 11/08/2021).

Muller, A., 2002, *Valuation of Land and Building for the Recurrent Property Tax and for Other Taxes*. http://www1.worldbank.org/publicsector/tax/valuation.htm (Accessed 17/08/2021).

Muzzini, E. & Aparicio, G., 2013, *Urban Growth and Spatial Transition in Nepal: An Initial Assessment*, The World Bank.

Myers, M. D., 2013, *Qualitative Research in Business and Management*, SAGE publications, London, Thousand Oaks, New Delhi and Singapore.

National Land Use Project, 2015, National Level Specification for the Preparation of VDC Level Land Resource Maps, Database and Reports, Kathmandu, Nepal.

National Legislative Bodies/ National Authorities Nepal, 2006, *Comprehensive Peace Accord Signed between Nepal Government and the Communist Party of Nepal (Maoist)*. https://www.refworld.org/docid/5b3f7a104.html (Accessed 23/08/2021).

National Planning Commission, 2015, A Study Report for the Feasability of Integrated Settlement Planning in Bajura District, National Planning Commission, Kathmandu.

National Reconstruction Authority, 2017, Frequently Ask Questions about the Reconstruction Process in Nepal, National Reconstruction Authority Nepal, Kathmandu.

National Reconstruction Authority, 2019, Five Years of Reconstruction: 2015-2020, National Reconstruction Authority, Kathmandu, Nepal.

National Reconstruction Authority, 2021, Six Years of Reconstruction: 2015-2021, National Reconstruction Authority, Kathmandu, Nepal.
Needham, B, Segeren, A & Buitelaar, E, 2011, 'Institutions in Theories of Land Markets: Illustrated by the Dutch Market for Agricultural Land', *Urban Studies Journal*, 48 (1), pp. 161–176. https://doi.org/10.1177/0042098009360682.
Nepal, H. & Marasini, A., 2018, 'Status of Land Tenure Security in Nepal', *Nepalese Journal on Geoinformatics*, 17 (1), pp. 22-29.
Nepal, P., Khanal, N. R., Zhang, Y., Paudel, B. & Liu, L., 2020, 'Land Use Policies in Nepal: An Overview', *Land Degradation & Development*, 31 (16), pp. 2203-2212. https://doi.org/10.1002/ldr.3621.
Nepal Rastra Bank, 2011, A Report on Real Estate Financing in Nepal: A Case Study of Kathmandu Valley, Nepal Rastra Bank, Economic Analysis Division, Research Department, Nepal.
Nepal Rastra Bank, 2012, The Share of Kathmandu Valley in the National Economy, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2016a, Current Economic and Financial Situation of Country, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2016b, Current Economic and Financial Situation of Country (Table), Kathmandu, Nepal.
Nepal Rastra Bank, 2016c, Tendency of Remittance Recipient Household for Savings and Investment, Nepal Rastra Bank, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2017, Financial Stability Report, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2019a, Annual Report, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2019b, Current Economic and Financial Situation of Country, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2019c, Current Economic and Financial Situation of Country Kathmandu, Nepal.
Nepal Rastra Bank, 2019d, Monetary Policy for the Fiscal Year July 2019- July 2020, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2019e, Quarterly Bulletin, Nepal Rastra Bank, Kathmandu Nepal.
Nepal Rastra Bank, 2019f, A Survey Report on Foreign Direct Investment in Nepal, Nepal Rastra Bank, Kathmandu, Nepal.
Nepal Rastra Bank, 2020a, Annual Report, Kathmandu, Nepal.
Nepal Rastra Bank, 2020b, Monetary Policy for the Fiscal Year July 2020- July 2021, Nepal Rastra Bank, Kathmandu, Nepal.
Neupane, K. P., 2015, 'Public Assest Creation from Land Development Program' in Shrestha, U. S., Sharma, R. P. & Shrestha, J. (ed.), *Commitment: Reflections and Revelations*, pp. 104-107, Ministy of Urban Development, Kathmandu, Nepal.
Neupane, P., 2020, 'Public Private Partnership in Land Readjustment Project: A Case Study of Nepal', pp.
Noble, H. & Heale, R., 2019, 'Triangulation in Research, with Examples', *Evidence Based Nursing*, 22 (3), pp. ebnurs-2019-103145. http://dx.doi.org/10.1136/ebnurs-2019-103145.
Ohls, J.C., Weibserg, R.C. & White, M.J., 1974, 'The Effect of Zoning on Land Value', *Journal of Urban Economics* 1 (4), pp. 428-444. https://doi.org/10.1016/0094-1190(74)90005-9.
Ojha, A., 2019, 'Traffic Police Division Announces Plan to Intensify 'no horn' Campaign', *The Himalayan Times*, 30/05/2019, p.1,

https://kathmandupost.com/valley/2019/05/30/traffic-police-division-announces-plan-to-intensify-no-horn-campaign.
Okoli, Chitu & Pawlowski, Suzanne D., 2004, 'The Delphi Method as a Research Tool: an Example, Design Considerations and Applications', *Information & Management*, 42 (1), pp. 15-29. https://doi.org/10.1016/j.im.2003.11.002.
Olabanji, O.M. & Mpofu, K., 2014, 'Comparison of Weighted Decision Matrix, and Analytical Hierarchy Process for CAD Design of Reconfigurable Assembly Fixture', *Procedia CIRP*, 23, pp. 264-269. https://doi.org/10.1016/j.procir.2014.10.088.
Oli, P. P., 2010, *Land Pooling / Readjustment Programmes in Nepal*, FIG Congress 2010, Facing the Challenges – Building the Capacity, 11-16 April, Sydney, Australia, pp. 1-11. https://www.fig.net/resources/proceedings/fig_proceedings/fig2010/papers/ts09h/ts09h_oli_4553.pdf (Accessed 11/08/2021).
Ozdemir, M. S., 2005, 'Validity and Inconsistency in the Analytic Hierarchy Process', *Applied Mathematics and Computation*, 161 (3), pp. 707-720. https://doi.org/10.1016/j.amc.2003.12.099.
Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N. & Hoagwood, K., 2015, 'Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research', *Administration and Policy in Mental Health*, 42 (5), pp. 533-544. https://doi.org/10.1007/s10488-013-0528-y.
Palmer, D., Fricska, S., Wehrmann, B. & Augustinus, C., 2009, '*Towards Improved Land Governance*', Land Tenure Working Paper 11, FAO, Rome, pp. 1-60.
Palys, T., 2008. Purposive Sampling. In: Given, L. M. (ed.) The SAGE Encyclopedia of Qualitative Research Methods. Thousand Oaks, California: SAGE Publications.
Panta, Bishop, 2018, 'Non-Performing Loans & Bank Profitability: Study of Joint Venture Banks in Nepal', *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 42, pp. 151-165.
Paudel, B., Pandit, J. & Reed, B., 2013, *Fragmentation and Conversion of Agriculture Land in Nepal and Land Use Policy 2012*, Munich Personal RePEc Archive MPRA Paper No.58880 https://mpra.ub.uni-muenchen.de/id/eprint/58880 (Accessed 17/08/2021).
Paudyal, D. R., 2012, 'Spatial Information Sharing for Catchment Management in Australia', PhD Thesis, University of Southern Queensland, Australia.
Phang, S. Y., 2013, 'Market Failures' in Phang, S.-Y. (ed.), *Housing Finance Systems: Market Failures and Government Failures*, pp. 24-39, Palgrave Macmillan, London.
Phellas, C. N., Bloch, A. & Seale, C., 2011, *Structured Methods: Interviews, Questionnaires and Observation*.
Pivasevic, J. & Hafner, P., 2013, 'Institutional Dimension of Sustainable Development', *School of Business*, 3 (4), pp. 119-128. https://doi.org/10.5937/skolbiz1304119P.
Potsiou, C. A., 2006, '*Land Markets and e-Society, International Trends and the Situation in Greece*', Presented at the FIG Workshop on eGovernance, Knowledge Management and eLearning, Budapest, Hungary, pp. 1-18.
Poudel, U., 2018, 'Government to Review Petition against Land Compensation Verdict', *The Himalayan Times*, 06/08/2018, p.12,

https://thehimalayantimes.com/business/govt-to-file-review-petition-against-land-compensation-verdict.
Pradhan, B., Sharma, P. & K Pradhan, P., 2020, 'Urban Growth and Environment and Health Hazards in Kathmandu Valley, Nepal' in Singh R., Srinagesh B. & S., A. (ed.), *Urban Health Risk and Resilience in Asian Cities. Advances in Geographical and Environmental Sciences*, pp. 293-324, Springer, Singapore.
Ramanathan, R., 2001, 'A Note on the Use of the Analytic Hierarchy Process for Environmental Impact Assessment', *Journal of Environmental Management*, 63 (1), pp. 27-35. https://doi.org/10.1006/jema.2001.0455.
Rasheed, S. & Parambath, G. S., 2014, 'Urban Land Management and Planning - Indian Context', *International Journal of Scientific & Engineering*, 5 (7), pp. 58-62.
Ravindran, V., 2019, 'Data Analysis in Qualitative Research', *Indian Journal of Continuing Nursing Education*, 20 (1), pp. 40-45. https://doi.org/10.4103/ijcn.ijcn_1_19.
Reps, J. W & Smith, J. L., 1962, *Control of Urban Land Subdivision*, 14.).
Ricardo, D., 1821, On the Principles of Political Economy and Taxation,[Online] Library of Economics and Liberty, 3rd edn, John Murray, London, http://www.econlib.org/library/Ricardo/ricP6.html#Ch.24, Adam Smith concerning the Rent of Land (Accessed 05/03/2017).
RICS, 2002, 'Property in Business: a Waste of Space?', Royal Institute of Chartered Surveyors (RICS), London.
Rimal, B., Zhang, L., Fu, D., Kunwar, R. & Zhai, Y., 2017, 'Monitoring Urban Growth and the Nepal Earthquake 2015 for Sustainability of Kathmandu Valley, Nepal', *Land*, 6 (2), pp. 42. doi:10.3390/land6020042.
Rimal, P., 2018, 'Apex Court Upholds MoLRM's Decision, Says Prevention of Disintegration of Arable Land in Conformity With Law', *The Himalayan Times*, 18/05/2018, p.2, https://thehimalayantimes.com/kathmandu/apex-court-upholds-molrms-decision/.
Rindfleisch, A., 2019, 'Transaction Cost Theory: Past, Present and Future', *AMS Review*, 10, pp. https://doi.org/10.1007/s13162-019-00151-x.
Rindfleisch, A. & Heide, J. B., 1997, 'Transaction Cost Analysis: Past, Present, and Future Applications', *Journal of Marketing*, 61 (4), pp. 30-54. https://doi.org/10.1177/002224299706100403.
Rodríguez-Rosa, M., Gallego-Álvarez, I., Vicente-Galindo, M. P. & Galindo-Villardón, M. P., 2017, 'Are Social, Economic and Environmental Well-Being Equally Important in all Countries Around the World? A Study by Income Levels', *Social Indicators Research*, 131 (2), pp. 543-565. https://doi.org/10.1007/s11205-016-1257-x.
Saaty, T. L., 1983, 'Priority Setting in Complex Problems', *IEEE Transactions on Engineering Management*, EM-30 (3), pp. 140-155. https://doi.org/10.1109/TEM.1983.6448606.
Sahari, S. N., Samsudin, S., Bujang, A. A., Suratman, R., Abd Rahman, M. S. & Jiram, W. R. A., 2020, 'General Review on Malaysia Land Taxation', *International Journal of Academic Research in Business and Social Sciences*, 10 (3), pp. https://doi.org/10.6007/IJARBSS/v10-i3/7071.
Sahoo, S., Dhar, A. & Kar, A., 2016, 'Environmental Vulnerability Assessment Using Grey Analytic Hierarchy Process Based Model', *Environmental Impact Assessment Review*, 56, pp. 145-154. https://doi.org/10.1016/j.eiar.2015.10.002.

Sairinen, R., 2004, 'Assessing Social Impacts of Urban Land-use Plans: From Theory to Practice', *Boreal Environment Research*, 9, pp. 509-517.
Saldaña, J., 2013, *The Coding Manual for Qualitative Researchers*, Third Edition, SAGE Publications, Thousand Oaks, California.
Sapkota, C., 2013, 'Remittances in Nepal: Boon or Bane?', *The Journal of Development Studies*, 49 (10), pp. 1316-1331. 10.1080/00220388.2013.812196.
Sapkota, N., Khatri, S. & Aryal, R., 2008, 'Financial Institutions and Economic Growth: The Case of Nepal', MSc Thesis, University of Skövde, Sweden.
Saunders, M., Lewis, P. & Thornhill, A., 2009, *Research Methods for Business Students*, Fifth Edition, Pearson Education, Harlow, England;.
Saunders, M., Lewis, P. & Thornhill, A., 2015, 'Understanding Research Philosophies and Approaches' in Lewis, P. & Thornhill, A. (ed.), *Research Methods for Business Students*, Sixth Edition, pp. 122-161, Pearson Education Ltd., Harlow, UK.
Saunders, M., Lewis, P. & Thornhill, A., 2019, 'Understanding Research Philosophies and Approaches' in Lewis, P. & Thornhill, A. (ed.), *Research Methods for Business Students*, Eighth Edition, pp. 122-161, Pearson Education Ltd., Harlow, UK.
Saunders, W. S. A. & Kilvington, M., 2016, 'Innovative Land Use Planning for Natural Hazard Risk Reduction: A consequence-driven Approach from New Zealand', *International Journal of Disaster Risk Reduction*, 18, pp. 244-255. https://doi.org/10.1016/j.ijdrr.2016.07.002.
Saxena, A. & Jat, M. K., 2020, 'Land Suitability and Urban Growth Modelling: Development of SLEUTH-Suitability', *Computers, Environment and Urban Systems*, 81, pp. 101475. https://doi.org/10.1016/j.compenvurbsys.2020.101475.
Schirmer, J., 2014, *Socio-Economic Impacts of Land Use Change to Plantation Forestry: A Review of Current Knowledge and Case Studies of Australian Experience*. https://www.researchgate.net/publication/242294421_SocioEconomic_Impacts_of_Land_Use_Change_to_Plantation_Forestry_A_Review_of_Current_Knowledge_and_Case_Studies_of_Australian_Experience (Accessed 02/09/2021).
Schnidman, F., 1988, 'Land Readjustment:' *Urban Land*, pp. 1-6.
Schou, L., Høstrup, H., Lyngsø, E., Larsen, S. & Poulsen, I., 2011, 'Validation of a New Assessment Tool for Qualitative Research Articles', *Journal of Advanced Nursing*, 68, pp. 2086-94. https://doi.org/10.1111/j.1365-2648.2011.05898.x.
Selinske, M., Coetzee, J., Purnell, K. & Knight, A., 2014, 'Understanding the Motivations, Satisfaction, and Retention of Landowners in Private Land Conservation Programs', *Conservation Letters*, 8, pp. https://doi.org/10.1111/conl.12154.
Sharma, B. R., 2003, *A Short Notice on the National Population Census of Nepal*, Central Bureau of Statistics. www.cbs.gov.np (Accessed 23/08/2021).
Shrestha, B., 2011, The Land Development Boom in Kathmandu Valley International Land Coalition.
Shrestha, B. K., 2010, 'Housing Provision in the Kathmandu Valley: Public Agency and Private Sector Initiation', *Urbani Izziv*, 21 (2), pp. 85-95.
Shrestha, P.M., 2019, 'Verdict on Nagdhunga-Kalanki Road Expansion Has Knock-on Effect on Other Projects, Locals Who Were Ready to Give up Land for Road

Expansion Are Now Seeking Compensation in Line with the Supreme Court's Order', *The Kathmandu Post*, 16/04/2019, p.1, https://epaper.ekantipur.com/kathmandupost/2019-04-16.

Shrestha, R., 2015, 'Nepalese Print Media Coverage on the Issue of Urban Development and Function of the KVDA in the Kathmandu Valley ' in Shrestha, U. S., Sharma, R. P. & Shrestha, J. (ed.), *Commitment: Reflections and Revelations*, pp. 227-231, Ministry of Urban Development, Kathmandu, Nepal.

Shrestha, S., Amatya, I. M., Bajracharya, A., Joshi, K., Bajracharya, L. & Shrestha, N. R, 2017, Land Pooling Projects in Nepal: A Consolidated Documentation, Tribhuvan University, Kathmandu, Nepal.

Shultz, M. M. & Groy, J. B., 1988, 'The Failure of Subdivision Control in the Western United States: A Blueprint for Local Government Action', *Utah Law Review*, 569 (1988), pp. 571-674.

Shultz, Steven & Fridgen, Pat, 2001, 'Floodplains and Housing Values: Implications for Flood Mitigation Projects', *JAWRA Journal of the American Water Resources Association*, 37, pp. 595-603. https://doi.org/10.1111/j.1752-1688.2001.tb05496.x.

Singh, P., 2015, 'Integrated Plan Ready for Bajura Development', *The Himalayan Times*, 05/08/2015, https://thehimalayantimes.com/nepal/integrated-plan-ready-for-bajura-development/.

Spangenberg, J., 2002, 'The Institutional Dimension of Sustainable Development', *Sustainability Indicators: A Scientific Assessment*, pp. 107-124.

Srivastava, A. & Thomson, S. B., 2009, 'Framework Analysis: A Qualitative Methodology for Applied Policy Research', *Journal of Administration & Governance (JOAAG)*, 4 (2), pp. 72-79.

Stein, D. & Suykens, B., 2014, *Land Disputes and Settlements Mechanism in Nepal's Terai*, Justice and Security Research Programme (JSRP), The Asia Foundation (12a). http://eprints.lse.ac.uk/56348/1/JSRP_Paper12a_Land_disputes_and_settlement_mechanisms_Suykens_and_Stein_2014.pdf (Accessed 18/07/2021).

Stirling, A., 2008, "'Opening Up" and "Closing Down"', *Science Technology & Human Values*, 33 (2), pp. 262-294. https://doi.org/10.1177/0162243907311265.

Subedi, G. P., 2016, 'Land Administration and Its Impact on Economic Development', PhD Thesis, University of Reading, England, https://doi.org/10.13140/RG.2.1.4139.9281.

Subedi, N. R., Navarra, D. & H. J. Lemmen, C., 2009, 'Evaluation of Success of National Geographic Information Infrastructure (NGII): User Satisfaction Perspective (A case in Nepal) ', MSc Thesis, International Institute for Geo-Information Science and Earth Observation (ITC), The Netherlands, Enschede, The Netherlands.

Survey Department. 2003, Average Agricultural Holding Size. Kathmandu Nepal: Central Bureau of Statistics.

Tashakkori, A & Teddlie, C., 2008, *Foundations of Mixed Methods Research : Integrating Quantitative and Qualitative Techniques in the Social and Behavioral Sciences*, SAGE Publications, Thousand Oaks, California.

Tashakkori, A. & Teddlie, C. (eds.), 2010, *SAGE Handbook of Mixed Methods in Social and Behavioural Research*, Second Edition: SAGE Publications, Thousand Oaks, California.

The Constituent Assembly of Nepal, 2015, *The Constitution of Nepal 2015*, Government of Nepal.
Timalsina, K., 2019, 'Agricultural Subsidies: Are they Effective?', *The Himalayan Times*, 18/09/2019, p.6, https://thehimalayantimes.com/opinion/agricultural-subsidies-are-they-effective.
Timilsina, N., 2014, *Determinants of Bank Lending in Nepal*, Nepal Rastra Bank. https://www.nrb.org.np/contents/uploads/2019/12/3.pdf (Accessed 23/08/2021).
Tiwari, B. K., 2015, 'Result and Lessons of Road Widening Initiative in Kathmandu Valley' in (ed.), *Commitment: Reflections and Revelations*, pp. 227-231, Kathmandu Valley Development Authroity, Kathmandu, Nepal.
Tongco, M. D. C, 2007, 'Purposive Sampling as a Tool for Informant Selection', *Ethnobotany Research and Applications*, 5, pp. 147-158.
Tracey, S. & Bayley, A., 2009, 'What is Sustainable Development?' in (ed.), *Sustainable Development: Linking Economy, Society, Environment*, pp. 20-35, OECD Publishing, Paris.
Tuladhar, A. M., 2004, 'Parcel-Based Geo-Information Systems: Concepts and Guidelines', PhD Thesis, International Institute for Geo-Information Science and Earth Observation, ITC, Dissertation Series No. 115, the Netherlands.
Tuladhar, A. M. & van der Molen, P., 2003, '*Customer Satisfaction Model and Organisation Strategies for Registration and Cadastral Systems*', 2nd Cadastral Congress, 19-21 September 2003, Kraków, Poland, pp. 43-52.
Tura, H. A., 2018, 'Land Rights and Land Grabbing in Oromia, Ethiopia', *Land Use Policy*, 70, pp. 247-255. https://doi.org/10.1016/j.landusepol.2017.10.024.
UN-HABITAT, 2018. Population Living in Slums (% of urban population) - Nepal. New York: The World Bank.
UNECE, 2005, *Land Administration in the UNECE Region-Development Trends and Main Principles*, United Nations Economic Commission for Europe, New York and Geneva.
UNFPA Nepal, 2017, Population Situation Analysis of Nepal, United Nations Population Fund Nepal, Kathmandu.
United Nations, 2018, Working Together: Integration, Institutions and the Sustainable Development Goals, World Public Sector Report 2018, Division for Public Administration and Development Management- Department of Economic and Social Affairs (DPADM), New York.
United Nations, 2020, The Sustainable Development Goals Report, Publications, U. N., New York, USA.
Upreti, B. R., Breu, T. & Ghale, Y., 2017, 'New Challenges in Land Use in Nepal: Reflections on the Booming Real-estate Sector in Chitwan and Kathmandu Valley', *Scottish Geographical Journal, 133:1, 69-82,* , 133 (1), pp. 69-82. https://doi.org/10.1080/14702541.2017.1279680
Ventresca, .J. & Mohr, J. W., 2017, 'Archival Research Methods' in (ed.), *The Blackwell Companion to Organisations, "Archival Research Methods"*, pp. 805-828, Blackwell Publishers, Oxford, England, https://doi.org/10.1002/9781405164061.ch35.
Wallace, J. & Williamson, I., 2006, 'Building Land Markets', *Land Use Policy*, 23, pp. 123-135. doi.org/10.1016/j.landusepol.2004.07.003.
Wallace, M., 2011, '*Land Administration to Support Sustainable Development*', FIG Working Week, 18-22 May 2011, Marrakech, Morocco, pp. 1-15.

Wang, J., Lin, Y., Glendinning, A. & Xu, Y., 2018, 'Land-Use Changes and Land Policies Evolution in China's Urbanisation Processes', *Land Use Policy*, 75, pp. 375-387. https://doi.org/10.1016/j.landusepol.2018.04.011.

Wehrmann, B., 2017, 'Understanding, Preventing and Solving Land Conflicts', *A Practical Guide and Toolbox. Printing and Distribution: Schleunungdruck GmbH, Eltertstr*, 27, pp. 1-56.

Williamson, I., Enemark, S., Wallace, J. & Rajabifard, A., 2010, *Land Administration for Sustainable Development*, ESRI Press, California, USA.

Williamson, I., Enemark, S., Wallace, J. & Rajabifard, A., 2010a, *Land Administration for Sustainable Development, Article*, FIG 2010 Congress, Facing the Challenges – Building the Capacity, 11-16, April, Sydney, Australia, pp. 1-16. www.eurocadastre.org/pdf/hopfer.pdf (Accessed 14/08/2021).

Williamson, I. P., 2000, *Best Practices for Land Administration Systems in Developing Countries*, Support for Long Term Development of Land Management Policies 25-27 July 2000, Jakarta, Indonesia, pp. 1-32. (Accessed 09/07/2021).

Woestenburg, A., 2014, *The Issue of Value and Price in Land Market Research*, FIG Congress 2014 Engaging the Challenges: Enhancing the Relevance 16-21 June 2014 Kuala Lumpur, Malaysia FIG, pp. 1-9. https://www.fig.net/resources/proceedings/fig_proceedings/fig2014/papers/ts04f/TS04F_woestenburg_7255.pdf (Accessed 21/08/2021).

World Bank, 2014, *Doing Business 2015: Going Beyond Efficiency*, Washington DC: World Bank Group, https://doi.org/10.1596/978-1-4648-0351-2.

World Bank, 2017, *Doing Business 2017: Equal Opportunity for All*, Washington, DC: World Bank Group, https://doi.org/10.1596/978-1-4648-0948-4.

World Bank, 2018, Doing Business 2018: Reforming to Create Jobs, Washington, DC: World Bank Group.

World Bank, 2019, Doing Business 2019: Training for Reform, Washington, DC: World Bank Group.

World Commission on Environment and Development, 1987, Our Common Future, Report of the World Commission on Environment and Development, Oxford University Press, Oxford. https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Wu, J. J., 2008, *Land Use Changes: Economic, Social, and Environmental Impacts*, Agricultural & Applied Economics Association 23 (4). http://www.choicesmagazine.org/UserFiles/file/article_49.pdf (Accessed 13/08/2021).

Yin, R. K., 2009, *Case Study Research: Design and Methods*, 4th Edition, SAGE Publications, Los Angeles, London, New Delhi, Singapore, Washington DC.

Yin, R. K., 2014, *Case Study Research: Design and Methods*, Fifth Edition, SAGE Publications, Thousands Oaks, California.

Zevenbergen, J., de Vries, W. & Bennett, R., 2016a, 'Future Directions in Responsible Land Administration' in Zevenbergen, J., de Vries, W. & Bennett, R. (ed.), *Advances in Responsible Land Administration*, pp. 271-278, CRS Press, Taylor & Francis Group, London.

Zevenbergen, J., de Vries, W. & Bennett, R., 2018, '*Dynamics in Responsible Land Administration; Change at Five Levels*', Proceedings of the FIG Congress, pp. 1-17.

Zevenbergen, J., de Vries, W. & Bennett, R. M., 2016b, *Advances in Responsible Land Administration*, CRC Press.

Žukauskas, P., Vveinhardt, J. & Andriukaitienė, R., 2018, 'Philosophy and Paradigm of Scientific Research' in (ed.), *Management Culture and Corporate Social Responsibility*, Edition 1, pp. 121-139, Infotech Open, London, United Kingdom.

Appendix 1: Participant Information Sheet for Interview

University of Southern Queensland

Participant Information for USQ Research Project Interview

Project Details

Title of Project:	**Measuring the Impact of Land Use Regulation on the Land Market in Nepal**
Human Research Ethics Approval Number:	H18REA064

Research Team Contact Details

Principal Investigator Details

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Description

The National Land Use Programme is one of the prioritised programmes (Programme of Category 'A') of the government of Nepal. Ministry of Agriculture, Land Management and Cooperatives (previously Ministry of Land Reform and Management (MOLRM)) has been undertaking many institutional reforms to implement land use programs. The Constitution of Nepal 2015 also mandates land use planning (Constituent Assembly Nepal, 2012). To implement the land use program in the country, *Land Act 1964* has been amended. This law mandates restrictions on the use of land allocated for one zone being used for another purpose. The government of Nepal has drafted a separate land use bill to bring it into effect to achieve the goals of land use policy.

Land use has been one of the fundamental issues in Nepal, either in direct or indirect form, since the implementation of the land reform programme in 1964 in Nepal. Land use implementation at the institutional and social level was always there even before the National

Land Use Policy 2012. Various policies in other sectors such as forest or agriculture policy also draw issues related to land use directly or indirectly. Various local governments started to regulate the use of land while granting building permits. Town planning committees, municipal authorities and various governmental departments have enforced land use to carry out their sectoral program successfully. The government may impose restrictions on land use in infrastructure development or expansion of reserves or national parks, or extension of electric powerlines. Further, Land Use Policy also mandates imposing restrictions on unauthorised land use through land zoning.

Such measures (before or after the approval of land use policy) of land use implementation may impact the land market previously functioning without any restrictive measures and can be positive or negative. To assess how much impact a land market may receive due to implementing a land use related program, I would like to get your support by participating in my data collection.

This project is being undertaken as part of a PhD Research Study. This project aims to identify the impact of land use regulation on the land market in Nepal. The research team requests your assistance because you have identified as an essential stakeholder in the land market with your role in the Nepalese financial sector.

Participation

Your participation will involve participation in an interview that will take approximately 30 minutes of your time. The interview will take place at the office of the National Geographic Information Infrastructure Branch (NGIIB), Min Bhawan, Survey Department Complex, Kathmandu, Nepal, within office hours of 10:00 AM to 5:00 PM on office workdays.

Questions will include issues about the impact of land use regulation on the land market in Kathmandu Valley. The interview will be audio recorded. If you do not wish for recording to occur, please advise the researcher.

Your participation in this project is entirely voluntary. If you do not wish to take part, you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. If you wish to withdraw from this project, please contact the Research Team (contact details at the top of this form).

Your decision, whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland or any of the organisations you are associated with.

Expected Benefits

It is expected that this project will not directly benefit you. However, the study's result will help identify issues that need immediate attention to safeguard the land

market (of which your organisation is one of the stakeholders) from the untoward effect of the implementation of land use regulation.

Risks

In participating in the interview, there are no anticipated risks beyond normal day-to-day living.

Privacy and Confidentiality

All comments and responses will be treated confidentially unless required by law. The recorded audio will be used for transcription. I will carry out the transcription. Please feel free to respond to whether you would like to receive a copy of the transcript for review and endorsement before inclusion in the project data. All comments and responses will be treated confidentially unless required by law. All identifiable data collected will be recorded, and accordingly, it will be made non-identifiable. The data will be used in the analysis. The result will be the consolidated data and will be published in journals. The non-identifiable data will also be accessible to the research team at the university. Please feel free to provide your response regarding the future use of data as to whether it can be used in a non-identifiable manner in future research of similar type or different types. You are also requested to opt for writing down the main points of your responses if you do not like to get the interview audio recorded.

If you would like to receive the project summary of results, it will be sent electronically (in *.pdf) to your email. If you wish to receive it in analogue form, it will be sent via mail at the address provided by you.
Any data collected as a part of this project will be stored securely as per the University of Southern Queensland's Research Data Management policy.

Consent to Participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a Research Team member prior to participating in your interview.

Questions or Further Information about the Project

Please refer to the Research Team Contact Details at the top of the form to answer any questions or request further information about this project.

Concerns or Complaints Regarding the Conduct of the Project

If you have any concerns or complaints about the project's ethical conduct, you may contact the University of Southern Queensland Manager of Research Integrity and Ethics on +61 7

4631 2214 or email researchintegrity@usq.edu.au. The Manager of Research Integrity and Ethics is not connected with the research project and can resolve your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this sheet for your information.

School of Civil Engineering and Surveying
University of Southern Queensland
Toowoomba, Queensland - 4350, Australia

Chief Investigator's Name: Nab Raj Subedi
PhD Candidate
Supervisor's Name: Professor Kevin McDougall, BSurv Qld, BSurv (Hons) Qld, MSurv & MapSc Qld, PhD Melb, MISAust SSSI.
Head of School (Civil Engineering and Surveying),
&
Dr Dev Raj Paudyal, BSc (Surveying), MSc ITC, the Netherlands, PhD USQ
Lecturer, School of Civil Engineering and Surveying

PARTICIPANT CONSENT FORM

By the act of submitting this survey, I hereby give my consent to participate in this study.

Title: Measuring the Impact of Land Use Regulation on the Land Market in Nepal

In giving my consent, I acknowledge that:

1. The procedure required for the data collection and the time involved has been explained to me, and any questions I have about this study have been answered to my satisfaction.
2. I have read the participation information statement and interview questions and have been given the opportunity to discuss the information and my involvement in the project with the researcher.
3. I understand that my involvement is strictly confidential, and no information about me will be used in any way that reveals my identity.
4. I understand that being in the study is completely voluntary – I am not under any obligation.
5. My responses are recorded and utilised not for any purpose other than this research study.

I Agree.

Signature:	Name:
Date:	Organisation: Role:

Appendix 2: Semi-Structured Interview Questions

1. The land use policy specifies its long-term goal ‘to achieve social, economic and environmental development’. Are there any changes across the economic dimension due to the enforcement of land use regulation in Kathmandu Valley? If yes, what changes have you observed?

2. Has the regulation affected the taxation and revenue collection in Nepal? If yes, how?

3. Has the implementation of the land use regulation caused any changes in the transaction cost? If yes, how have they occurred in your observation, especially regarding the loan application processing?

4. Have the land use restrictions affected mortgage availability from the bank and financial institutions in the land market of the Kathmandu Valley? If yes, how?

5. Is there a compensation or reward mechanism for the loss caused by introducing the land use regulation in Nepal? If yes, how are they paid?

6. Some restrictive measures such as land categorisation and subdivision restrictions were adopted to control the haphazard land use in Nepal. What social impact have these restrictions caused in the urban land market of Kathmandu Valley?

7. Has the social expectation been met by the implementation of the land use regulation? If yes or no, how?

8. *Land use policy 2015* specifies the resettlement of the people from the hazard-prone areas in Nepal. What impact has the land market experienced by the resettlement programme being executed to shift the people from the identified hazardous areas in the Kathmandu Valley?

9. Unplanned settlements cover a large area of the Kathmandu Valley. Amid this situation, the government has introduced land use restrictions, such as land classification, subdivision restriction and lot size control, among others. How has the land use regulation helped bring changes in the environmental condition that contributed to the urban land market of Kathmandu Valley?

10. There are many land use classes specified in the land use policy. However, the present land use pattern in the urban area is of mixed type. How has the current classification

system affected the land market if looked through the environmental safety of the Kathmandu Valley?

11. What institutional arrangements have been made to implement land use regulations that would control haphazard use of the land in the country?

12. Are there any complaints regarding the impact on the land market across institutional dimensions, such as violation of property rights, tenure security, and accessibility to land rights resulting from the implementation of land use regulation? If yes, what are the impacts, and how have they occurred?

13. Out of the four dimensions regarding the implementation of land use planning, which one is the most important that should be addressed first in your perspective?

14. How do you score the overall impact of the land use regulation on the urban land market of Kathmandu Valley, positive or negative?

Appendix 3: Participant Information Sheet for Questionnaire Survey

University of Southern Queensland

Participant Information for USQ Research Project Questionnaire Survey

Project Details

Title of Project:	**Measuring the Impact of Land Use Regulation on the Land Market in Nepal**
Human Research Ethics Approval Number:	H18REA064

Research Team Contact Details

Principal Investigator Details

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Supervisor Details

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Dr Dev Raj Paudyal
Email: DevRaj.Paudyal@usq.edu.au
Telephone: +61 7 4631 2291

Description

Respondent's Information

Questionnaire to Measure the Impact of Land Use Regulation on the Land Market in Nepal

Name of Respondent:

Specialty:

Title:

Date (DD/MM/YYYY):

Position:

Respondents' address:

Department /Involvement (if there is any):

Time:

Information for the respondents

National Land Use Programme is one of the prioritised programmes (Programme of Category 'A') of the government of Nepal. Recently, the Ministry of Land Management, Cooperatives and Poverty Alleviation (MOLMCPA) has been undertaking many institutional reforms to implement Land Use Programs in the country. The Constitution of Nepal 2015 mandates the execution of land use planning (Constituent Assembly Nepal, 2012) in Nepal. The government has introduced National *Land Use Policy 2012* and amended it to *Land Use Policy 2015*. Many local governments have begun to regulate land use while granting building permits. The government imposes restrictions on land use such as infrastructure development or expansion of reserves or national parks or buffering electric powerlines and roads. Further, *Land Use Policy 2015* mandates land use control through restrictions such as land categorisation, lot size control and subdivision restriction, to mention a few.

Implementing land use restrictions may impact the land market functioning without any restrictive measures either positively or negatively. The impact on the land market can be across the economic, social, environmental, and institutional dimensions. To assess the degree and direction of effects, I would like to request your support by providing your responses to this Questionnaire based on your experience or knowledge. The Questionnaire bears four class variables: economic, institutional, social, and environmental, with a few indicators associated with each of them.

The Questionnaire will assist the investigation of the barriers and impediments that limit the potential growth of the land market upon the introduction of land use implementation in Nepal. It will also help identify which impact factors that have higher weight, among others. The survey findings are expected to provide insight into how government should implement land use regulations to safeguard and regulate the land market. These findings will be presented as aggregated statistical summaries and access to survey participants and distributed through publications.

This Questionnaire is divided into three sections, Section A, B, and C. Section A consists of a set of general questions that seek our understandings of the prevailing land use situation in Nepal. Section B asks for rating the Impact Score for the changes in the land market that occurred due to the implementation of land use regulation in the country. Section C asks to provide rank or the importance level of an alternative in each pair of dimensions and impact factors.

The survey should take approximately 45-60 minutes to complete. The confidentiality of individuals will be fully preserved in the collection of responses and reporting of the results. I thank you in advance for your cooperation in providing this valuable information.

Appendix 4: Participant Consent Form and Questionnaire

Participant Consent Form for Questionnaire Survey

School of Civil Engineering and Surveying
University of Southern Queensland
Toowoomba, Queensland - 4350, Australia

Chief Investigator's Name: Nab Raj Subedi
PhD Candidate
Supervisor's Name: Professor Kevin McDougall, BSurv Qld, BSurv (Hons) Qld, MSurv & MapSc Qld, PhD Melb, MISAust SSSI.
Head of School (Civil Engineering and Surveying),
&
Dr Dev Raj Paudyal, BSc (Surveying), MSc ITC, the Netherlands, PhD USQ
Lecturer, School of Civil Engineering and Surveying

By the act of submitting this survey, I hereby give my consent to participate in this study.

Title: Measuring the Impact of Land Use Regulation on the Land Market in Nepal

In giving my consent, I acknowledge that:

1. The procedure required for the data collection and the time involved has been explained to me, and any questions I have about this study have been answered to my satisfaction.
2. I have read the Questionnaire or the participation Information statement and have been allowed to discuss the information and my involvement in the project with the researcher.
3. I understand that my involvement is strictly confidential, and no information about me will be used in any way that reveals my identity.
4. I understand that being in the study is entirely voluntary – I am not under any obligation.

I Agree.

Signature:	Name:
Date:	Organisation: Role:

Questionnaire

Section A: General Understanding of the Implementation of Land Use Regulation in Nepal

1. Are you aware of the approval of the National *Land use Policy 2012/2015*?
   - ○ *Yes*
   - ○ *No*

2. Are you aware of the implementation of the land use regulation in Nepal?
   - ○ *Yes*
   - ○ *No*

3. Which of the following relates to the land use regulation implemented in the country in your perspective?
   - ○ *Land classification*
   - ○ *Lot size control*
   - ○ *Subdivision restriction*
   - ○ *National Park & forest delineation*
   - ○ *Waste disposal area allocation*
   - ○ *Urban and infrastructure development*
   - ○ *Road zone allocation*
   - ○ *All*
   - ○ *Others…. …*

4. Do you agree that there is land use restriction introduced in the country? Please rate your response.

   ○ *Strongly Agree* ○ *Agree* ○ *Neither* ○ *Disagree* ○ *Strongly Disagree*

5. Do you agree that the introduction of the land use regulation has impact on the land market in Nepal? Please rate your response.

   ○ Strongly Agree ○ Agree ○ Neither ○ Disagree ○ Strongly Disagree

6. Do you agree that the implementing the land use regulation has enhanced zoning certainty?

   ○ Strongly Agree ○ Agree ○ Neither ○ Disagree ○ Strongly Disagree

7. Which of the following land use related restriction or activities has affected land price in the Kathmandu Valley?

	Strongly Agree	*Agree*	*Neither*	*Disagree*	*Strongly Disagree*
Land categorisation					
Lot size control					
Subdivision restriction					
Waste disposal area allocation					
Urban and infrastructure Development					
Road Expansion					
National Park & Forest Delineation					
Others…					

Section B: Scoring the Impact of Land Use Regulation on the Land Market.

8. In the left column of each table in sections 8.1, 8.2, 8.3 and 8.4 below, I provide you the three alternatives pertaining to the changes that occurred in the Nepalese land market after the introduction of land use regulation for the given impact indicator.

The right column of the tables provides a range of positive and negative scores (from +3 to −3) that reflects degree of the impact on the land market caused by the changes you selected in the left column.

Please select one alternative out of the provided in the left column in each row and then select corresponding impact score from right column. The scale of the impact score is given in the following table.

The scale of impact measurement

Extremely Positive	Quite Positive	Slightly Positive	Neither/equally Negative nor Positive	Slightly Negative	Quite Negative	Extremely Negative
3	**2**	**1**	**0**	**−1**	**−2**	**−3**

8.1 Impact Score Across the Economic Dimension							
8.1.1 Impact Factor: Transaction Cost							
8.1.1.1 Indicator: Changes in the cost of land transaction							
A. Which of the option given below fits the situation regarding changes in the transaction cost? Introducing the land use regulation caused the transaction fees to: (i) decrease (ii) have no change (iii) increase							
B. What impact score do you assign for the changes occurred in the land transaction cost?	3	2	1	0	-1	-2	-3
8.1.1.2 Indicator: Changes in the time required for a transaction through subdivision.							
A. Introducing the land use regulation caused the transaction time for a subdivision process to**:** (i) decrease (ii) have no change (iii) increase							
B. What impact score do you assign for the changes occurred in the land transaction time?	3	2	1	0	-1	-2	-3
8.1.2 Impact Factor: Valuation							
8.1.2.1 Indicator: Changes in the price of residential land							
A. Introducing the land use regulation caused the price of residential land to: (i) decrease (ii) have no change (iii) increase							
B. What score do you assign as an impact on the land market for the changes occurred in the price of residential land?	3	2	1	0	-1	-2	-3
8.1.2.2 Indicator: Changes in the price of agricultural land							

A. Introducing the land use regulation caused the price of agricultural land to:
(i) decrease (ii) have no change (iii) increase

B. What score do you assign as an impact on the land market for the changes occurred in the price of agricultural land?	3	2	1	0	-1	-2	-3

8.1.2.3 Indicator: Price speculation

A. Price speculation due to land categorisation or subdivision restriction:
(i) decreased (ii) No change (iii) increased

B. What score do you assign for the as an impact on the land market due to land price speculation?	3	2	1	0	-1	-2	-3

8.1.2.4 Indicator: Change in landowners' financial capability due to changes in the land value

A. Change in landowners' financial capability due to changes in the land value
The introduction of land use restriction caused the majority of landowners to
(i) enhance the financial capacity of landowners
(ii) No change in the land value
(iii) lose the financial capability of the landowners

B. What impact score do you assign for the change in landowners' financial capability due to changes in the land value?	3	2	1	0	-1	-2	-3

8.1.3 Impact Factor: Mortgage availability

8.1.3.1 Indicator: Changes in the financial strength of the financial institutions (Willingness of financial Institution to provide loans on mortgage)

A. Non-performing loan of the banks and financial institutions:
(i) decreased (ii) did not change (iii) increased as an effect of the introduction of land use regulation in Nepal.

B. What impact score do you assign for the change in the non-performing loan as an effect of land use regulation?	3	2	1	0	-1	-2	-3

8.1.3.2 Indicator: Changes in the number of landowners receiving the loan

A. Changes in the number of landowners who received the loan from financial institutions:
(i) increased (ii) did not change (iii) decreased

B. What impact score do you assign for the change in the number of landowners receiving the loan for real estate and residential housing to indicate an impact on changes in the mortgage availability due to land use regulation?	3	2	1	0	-1	-2	-3

8.1.3.3 Indicator: Capability of the landowners to repay the loan

A. The capacity of returning the loan back to the financial institutions due to the introduction of subdivision restriction
(i) decreased (ii) did not change (iii) increased

B. What impact score do you assign for the changes in the capacity of paying the loan back to the financial institutions as an effect of the land use regulation?	3	2	1	0	-1	-2	-3

8.1.4 Impact Factor: Taxation

8.1.4.1 Indicator: Changes in the Transfer Tax

A. The land use regulation caused the Transfer tax to:
(i) decrease (ii) have no effect (iii) increase

B. What score do you assign as an impact on the land market for the changes in the transfer tax as an impact of land use regulation?	3	2	1	0	-1	-2	-3

8.1.4.2 Indicator: Changes in Annual Land Tax

A. The land use regulation caused the land tax to:
(i) decrease (ii) have no effect (iii) increase

B. What score do you assign as an impact on the land market for the changes in the Annual land tax as an impact of land use regulation?	3	2	1	0	-1	-2	-3

8.1.4.3 Indicator: Changes in Capital Gains Tax

A. Changes in Capital Gains Tax
(i) decrease (ii) have no effect (iii) increase after the introduction of land use regulation.

B. What score do you assign as an impact on the land market for the changes in the Capital Gains Tax as an impact of land use regulation?	3	2	1	0	-1	-2	-3

8.1.4.4 Indicator: Penalties for 'no use' of the land

A. Changes in Penalties for 'no use' of the land
(i) Increased (ii) Did not change (iii) Decreased

B. What impact score do you assign for the provision of penalties for no use of land specified in the land use regulation?	3	2	1	0	-1	-2	-3

8.1.5 Impact Factor: Compensation

8.1.5.1 Indicator: Sufficiency of the compensation paid against the loss due to subdivision restriction.

A. The amount received as compensation for the sufficiency of the compensation paid against the loss due to subdivision restriction
(i) exceeded the prevailing market values.
(ii) not changed.
(iii) was less than the prevailing land market value or not paid at all.

B. What impact score do you assign for the sufficiency of compensation against the loss due to road expansion?	3	2	1	0	-1	-2	-3

8.1.5.2 Indicator: Sufficiency of compensation against the loss due to road expansion

A. The amount received as a compensation for the loss caused by the road expansion:
(i) exceeded the prevailing market values.
(ii) not changed.
(iii) was less than the prevailing land market value or not paid at all.

B. What impact score do you assign for the sufficiency of compensation against the loss due to road expansion?	3	2	1	0	-1	-2	-3

8.1.5.3 Indicator: Time required for the payment of compensation.

A. The compensation was:

(i) paid earlier than expected.
(ii) around the deadline.
(iii) delayed or never paid.

B. What impact score do you assign for the time take for the payment of compensation after the consequence of land use regulation?	3	2	1	0	-1	-2	-3

8.1.5.4 Indicator: Sufficiency of Subsidies

A. The enforced land use classification supported to allocate

(i) sufficient amount of subsidies to the landowners for non-residential use
(ii) no change in subsidies that was provided before the introduction of land use regulation
(iii) Reduced the amount of subsidies for non-residential use

B. What impact score do you assign for the motivation towards agriculture use of land as an effect of land use regulation?	3	2	1	0	-1	-2	-3

8.1 Impact Score Across the Social Dimension

8.2.1 Impact Factor: Awareness

8.2.1.1 Conflict between sellers and buyers due to lack of awareness of land use regulation

A. The introduction of land use regulation:

(i) caused to settle any existing disputes between the landowners and buyers.
(ii) did not have any impact regarding the conflict.

created conflict between them.

B. What score do you assign to indicate the effect on the relationship between buyers and sellers as an impact of land use regulation?	3	2	1	0	-1	-2	-3

8.2.1.2 Dispute between clients and staffs over the failure of parcel subdivision.

A. The introduction of land use regulation:

(i) caused to complete the transaction with a better interrelationship between clients and staff,
(ii) as usual
(iii) caused to created argument or conflict between the client and staff.

B. What score do you assign to indicate the effect on the relationship between clients and staffs over the failure of parcel subdivision due to the subdivision restriction?	3	2	1	0	-1	-2	-3

8.2.2 Impact Factor: Expectation.

8.2.2.1 Indicator Ease of the subdivision process

A. The introduction of land use regulation:

(i) caused to complete the transaction with a better interrelationship between clients and staff,
(ii) as usual
(iii) caused to created argument or conflict between the client and staff.

B. What impact score do you assign regarding the ease of the subdivision process after the enforcement of land classification and subdivision restrictions?	3	2	1	0	-1	-2	-3

8.2.2.2 Indicator: Changes in the number of court order cases for subdivision approval

A. After introducing subdivision restriction, the number of court orders for subdivision of parcel
(i) Decreased (ii) Did not change (iii) Increased

B. What impact score do you assign for requirement of court order to acquire the subdivision approval?	3	2	1	0	-1	-2	-3

8.2.3 Impact Factor: Proximity

8.2.3.1 Indicator: Satisfaction of landowners due to distance to the workplace/Dwellings.

A. The satisfaction of landowners due to distance to the workplace from the allocated safe settlement was:
(i) increased (ii) did not change (iii) decreased
as compared to the distance to the workplace from the existing dwelling.

B. What impact score do you assign for the effect on the landowners due to the distance from the existing dwellings to the relocation areas after the government declared your house in landslide hazard areas?	3	2	1	0	-1	-2	-3

8.2.3.2 Indicator: Number of the land market participant

A. Number of landowners/buyers in the existing local land market of Kathmandu valley due to the resettlement programme:
(i) increased (ii) did not change (iii) increased

B. What impact score do you assign for the changes in the land market participants as an effect of the government's declaration hazardous areas?	3	2	1	0	-1	-2	-3

8.3 Impact Score Across the Environmental Dimension

8.3.1 Impact Factor: Risk Reduction

8.3.1.1 Changes in the flood-risk area in the Kathmandu Valley

A. Risk reduction during the implementation of land use regulation in Kathmandu valley caused flood hazard areas to:
(i) reduce (ii) have no change (iii) decrease.

B. What score do you assign to indicate the impact of the flood risk activities as the part of land use management activities undertaken in the Kathmandu Valley?	3	2	1	0	-1	-2	-3

8.3.1.2 Changes in the road space across the Kathmandu valley

A. The implementation of road zoning has caused the road corridor space to
(i) increase (ii) no change (iii) decrease across the Kathmandu valley

B. What score do you assign to indicate the impact on the land market due to the road expansion activities undertaken in the Kathmandu Valley?	3	2	1	0	-1	-2	-3

8.3.2 Impact Factor: Quality of Residential Land

8.3.2.1 Supply of quality residential land with added open space and better utility infrastructure in land pooling areas.

A. After the implementation of land use regulation, the supply of residential land with added open space and better utility infrastructure in land pooling areas
(i) increased (ii) did not change (iii) decreased as compared to the surrounding nonplanned areas in the Kathmandu Valley.

B. What score do you assign to indicate the impact of land use regulation on market regarding the supply of develop land in the Kathmandu Valley?	3	2	1	0	-1	-2	-3

8.3.2.2 Change in the land value of quality residential plots compared to surrounding unplanned areas.

A. The land value of quality residential plots compared to surrounding unplanned areas:
(i) increased (ii) did not change (iii) increased

B. What score do you assign to indicate the impact of land use regulation on market regarding the changes in the supply of quality residential plots compared to surrounding unplanned areas of Kathmandu Valley?	3	2	1	0	-1	-2	-3

8.3.3 Impact Factor: Suitability of Zoning Classification

8.3.3.1 Sufficiency of land allocated for non-agricultural purpose.

A. The enforced land use classification supported to allocate
(i) enough land for non-agricultural purposes, mainly residential
(ii) no change in the land requirement
(iii) insufficient amount of land for non-agricultural purposes**.**

B. What impact score do you assign as an effect on the land market regarding the sufficiency of land for non-agricultural use after the implementation of land use regulation?	3	2	1	0	-1	-2	-3

8.3.3.2 Changes in the haphazard housing construction in agricultural land in Kathmandu Valley

A. After the introduction of land use policy/regulation, the haphazard construction in areas other than plotting or planning of the Kathmandu valley (i) increased (ii) have no change (iii) decreased

B. What impact score do you assign as an effect on the land market regarding the use of agricultural land after the introduction of land use policy or land use regulation?	3	2	1	0	-1	-2	-3

8.4 Impact Score Across the Institutional Dimension

8.4.1 Impact Factor: Lot Size

8.4.1.1 Number of available parcels qualifying for the market transaction.

A. Number of available parcels qualifying for the market transaction through subdivision due to lot size control-

(i) increased (ii) did not change (iii) decreased.

B. What impact score do you assign as an effect on the land market due to the changes in the availability of land in the land market?	3	2	1	0	-1	-2	-3

8.4.1.2 Changes in the transaction volume

A. The Lot size control affected the subdivision of parcel smaller than one hectare.

(i) Number of transactions of land parcel bigger than half a hectare increased.
(ii) No change in the transaction
(iii) Number of transactions of land parcel bigger than half a hectare decreased.

B. What impact score do you assign to the changes in the transaction volume an effect on the land market due to the changes in lot size control?	3	2	1	0	-1	-2	-3

8.4.2 Impact Factor: Subdivision Restrictions

8.4.2.1 ***Number of informal transactions***

A. Informal transaction in the land market due to the land use restriction

(i) increased (ii) did not change (iii) decreased

B. What impact score do you assign to the changes transaction type as a result of the land use restriction on the land market?	3	2	1	0	-1	-2	-3

8.4.2.2 Accessibility to the adjoining parcel to use for road purpose.

A. After the subdivision restriction, landowners who required a small piece of land from the adjoining parcel for a road purpose could not buy it. The ease of use of land was found to:

(i) increase (ii) have no change (iii) decrease.

B. What score do you assign to indicate an impact on the land market regarding the ease of access or ease of use of land for road purpose	3	2	1	0	-1	-2	-3

8.4.3 Impact Factor: Coordination

8.4.3.1 Number of private lots affected by the road expansion

A. Coordination between Survey offices and Kathmandu Valley Development Authority during the road expansion supported to

(i) recover private parcels which were distributed to the respective landowners.
(ii) Neither any parcels were recovered and distributed to the landowners, nor they were acquired from them.
acquire private land from the landowners

B. What score do you assign to indicate an impact on the land market regarding the number of private lots affected by the road expansion?	3	2	1	0	-1	-2	-3

8.4.3.2 Number of court cases registered against the KVDA to secure property rights.

A. Execution of the road expansion by KVDA raised the concern about the security of property rights. In the Kathmandu valley, the cases for the property right violation

(i) decreased (ii) did not change (iii) increased

B. What score do you assign to indicate an impact on the land market regarding the effect on the property rights due to the road zone expansion across Kathmandu Valley.	3	2	1	0	-1	-2	-3

8.4.3.3 Zoning Certainty

A. ***The existing coordination mechanism caused to have***

(i) increased zoning certainty in the land market resulted in loss and increase in property right violation.

(ii) no change in the understanding of the zoning information associated with a land lot

(iii) reduced zoning certainty about using the land in the land market and landowners are getting more secured use of land

B. What score do you assign to indicate an impact on the land market because of the zoning certainty across Kathmandu Valley?	3	2	1	0	-1	-2	-3

Section C: Ranking Dimensions and Impact Factors

9. In this section I request you to provide a Rank for each alternative out of the pairs given in the tables of question 9.1, 9.2, 9.3, 9.4. The rank denotes the level of importance of an alternative compared to the other in the given pair. Each rank value and its explanation has been given in the following table.

Relative scale of importance used for ranking Saaty (1983)

Rank	Definition	Explanation
1	Equal importance	Two impact factors contribute equally to the land market
3	Moderate importance	Slightly favours one over the other
5	Essential or strong importance	Strongly favours one over another
7	Demonstrated importance	The dominance of demonstrated importance in practice
9	Extreme importance	Evidence favouring one over the other of highest possible order of affirmation
2, 4, 6, 8	Intermediate values	When compromise is needed in ranking

9. Which of the dimension in each row given in the following table do you think is of higher or lower importance than the other? Please select one score in each row to assign the importance level of an alternative in the pair given in the following table.

Dimension	More important than								Equal	Less important than								Dimension
Institutional	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Economic
Institutional	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social
Institutional	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental
Economic	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social
Economic	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental
Social	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental

9.1 Across the **Economic Dimension**, three identified impact factors are associated with the impact on the land market. They are Valuation, Compensation, Transaction Cost, Taxation, Mortgage Availability.

Which of the impact factor in each row given in the following table do you think is higher or lower important than the other? Please select one score in each row to assign the importance level of an impact factor in the pair given in the following table.

Impact factor	More important than								Equal	Less important than								Impact Factor
Compensation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Valuation
Compensation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Mortgage Availability
Compensation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transaction Cost
Compensation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Taxation
Valuation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Mortgage Availability
Valuation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transaction Cost
Valuation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Taxation
Mortgage Availability	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transaction Cost
Mortgage Availability	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Taxation
Transaction Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Taxation

9.2 Across the **Social Dimension**, three identified impact factors are associated with the impact on the land market. They are Awareness, Expectation, and Proximity.

Which of the impact factor in each row of the following table do you think is higher or lower important than the other in each row specified in the following table? Please select one score in each row to assign the importance level of an impact factor in the pair given in the following table.

Impact Factor	More important than								Equal	Less important than								Impact Factor
Awareness	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Expectation
Expectation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Proximity
Proximity	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Awareness

9.3 Across the **Institutional Dimension**, three identified impact factors are associated with the impact on the land market. They are Coordination, Subdivision Restriction, Lot Size Control.

Which of the impact factor in each row of the following table do you think is higher or lower important than the other in each row specified in the following table? Please select one score in each row to assign the importance level of an impact factor in the pair given in the following table.

Impact Factor	More important than								Equal	Less important than								Impact Factor
Coordination	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Subdivision Restrictions
Subdivision Restrictions	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lot Size Control
Lot Size Control	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Coordination

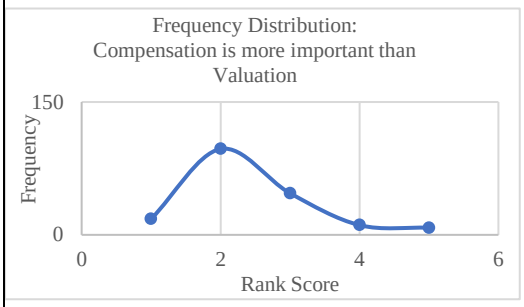
9.4 Across the **Environmental Dimension**, three identified impact factors are associated with the impact on the land market. They are Risk reduction, Quality of residential land, Suitability of zoning classification.

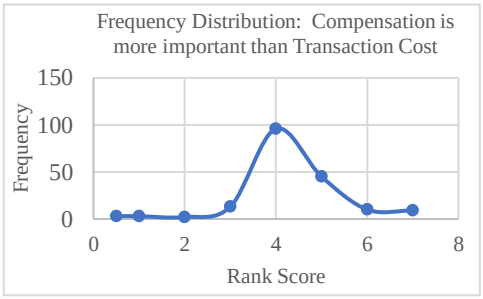
Which of the following impact factors do you think is of higher or lower importance than the other in each row specified in the following table? Please select one score in each row to assign the importance level of an impact factor in the pair given in the following table.

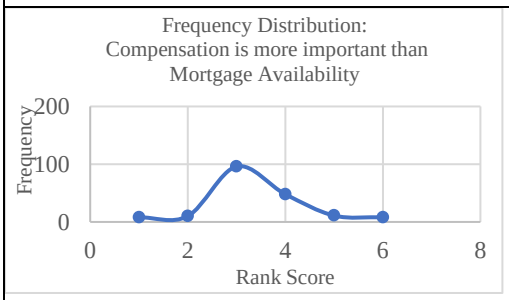
Impact Factor	More important than								Equal	Less important than								Impact Factor
Risk Reduction	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Quality of Residential Land
Quality of Residential Land	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Suitability of Zoning Classification
Suitability of Zoning Classification	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Risk Reduction

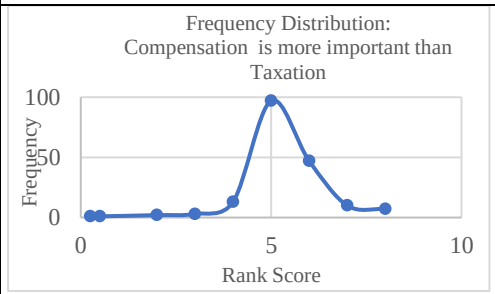
Appendix 5: Distribution of Ranks of Impact Factors

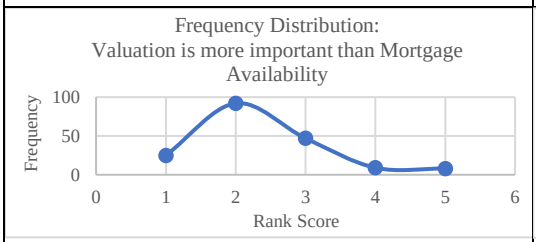
A. **Distribution of ranks of impact factors across the economic dimension**

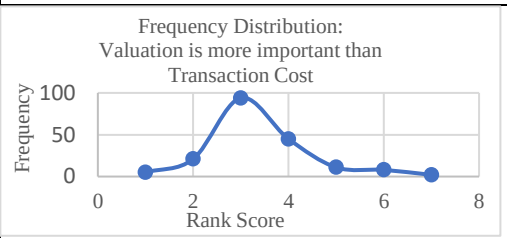


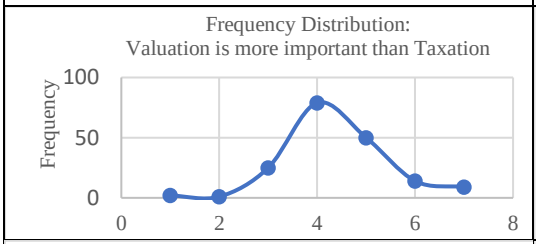


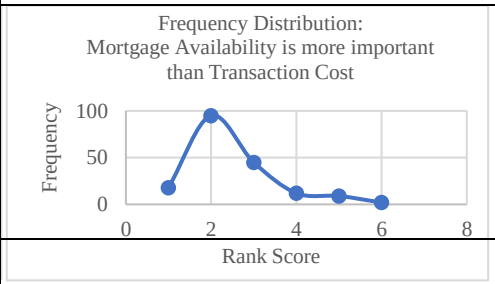


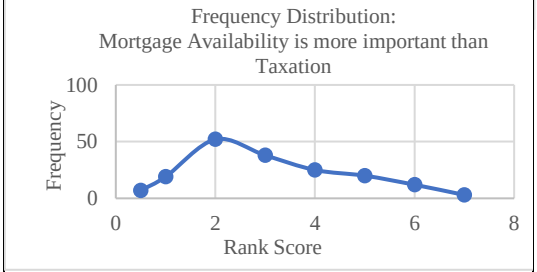


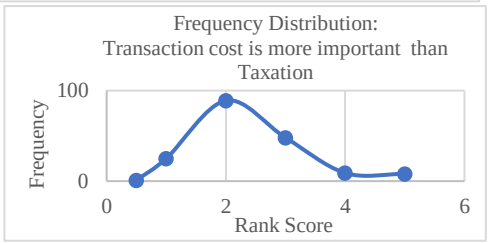




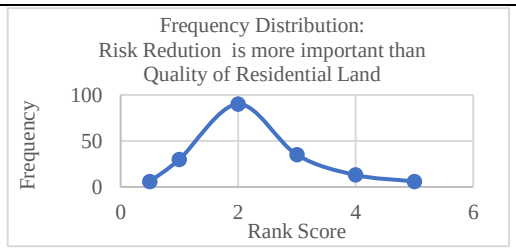


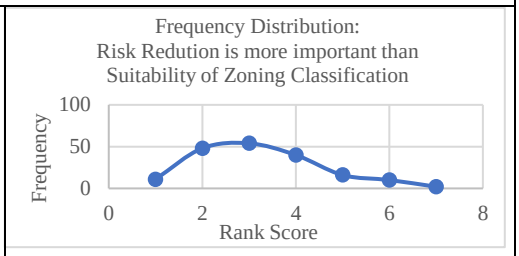


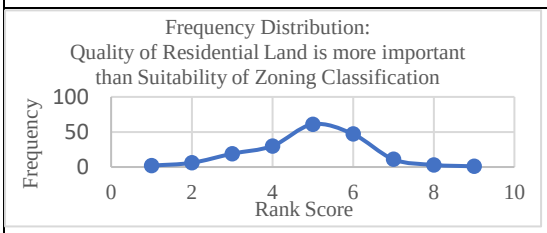




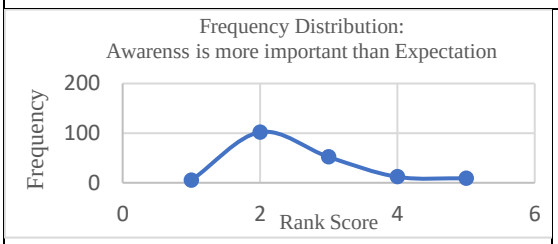
Rank of impact factors across the environmental dimension

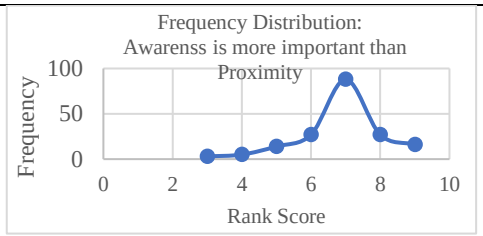


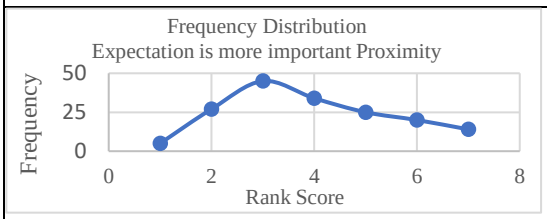




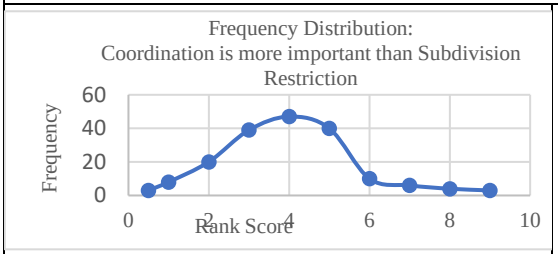
Rank of impact factors across the social dimension

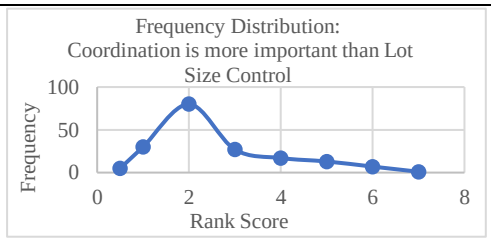


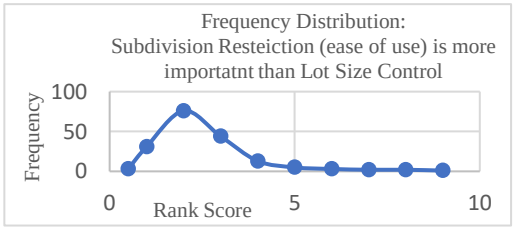




Rank of impact factors across the institutional dimension







Appendix 6: Calculated Average Rank of Impact Factors

Rank of the Impact Factor Calculated from the Respondents-Assigned Raw Rank Data

(i) Comparison of impact factors across the economic dimension	**Average Rank**
Compensation is more important than Valuation	2.2527
Compensation is more important than Mortgage Availability	3.2079
Compensation is more important Transaction Cost	4.0806
Compensation is more important than Taxation	5.1021
Valuation is more important than Mortgage Availability	2.1764
Valuation is more important than Transaction Cost	3.2381
Valuation is more important than Taxation	4.2556
Mortgage availability is more important than Transaction Cost	2.2903
Mortgage availability is more important than Taxation	2.6378
Transaction cost is more important than Taxation	2.1646
(ii) Comparison of impact factors across the social dimension	**Average Rank**
Awareness is more important than Expectation	2.4183
Awareness is more important than Proximity	6.7485
Expectation is more important than Proximity	3.7884
(iii) Comparison of impact factors across the environmental dimension	**Average Rank**
Risk reduction is more important than Quality of Residential Land	2.084
Risk reductions are more important than Zoning Adequacy	2.9418
Quality of Residential Land is more important than Zoning Adequacy	4.7076
(iv) Comparison of impact factors across the institutional dimension	**Average Rank**
Coordination is more important than Subdivision Restriction (ease of use)	2.1842
Coordination is more important than Lot Size Control	3.5621
Subdivision Restriction Risk reduction is more important than Lot Size Control	2.1843

Appendix 7: Derivation of Weights of Dimensions and Impact Factors

Derivation of Weight of Dimensions

Rank Matrix

Dimensions	Economic	Social	Environmental	Institutional
Economic	1.0000	1.4392	1.3770	1.3981
Social	0.6949	1.0000	0.5242	0.7491
Environmental	0.7262	1.9077	1.0000	1.5070
Institutional	0.7152	1.3350	0.6636	1.0000
Total	3.1363	5.6818	3.5648	4.6542

Normalisation

					Sum	Weight
Economic	0.3188	0.2533	0.3863	0.3004	1.2588	**0.3147**
Social	0.2216	0.1760	0.1471	0.1609	0.7055	**0.1764**
Environmental	0.2316	0.3357	0.2805	0.3238	1.1716	**0.2929**
Institutional	0.2281	0.2350	0.1861	0.2149	0.8640	**0.2160**
Total	1	1	1	1		1

Multiplying original rank with the corresponding weight

Weights Transposed	**0.3147**	**0.1764**	**0.2929**	**0.2160**
Economic	1.0000	1.4392	1.3770	1.3981
Social	0.6949	1.0000	0.5242	0.7491
Environmental	0.7262	1.9077	1.0000	1.5070
Institutional	0.7152	1.3350	0.6636	1.0000

Calculating Consistency Ratio

					Weighted sum (WS)	Criteria Weights (CW)	∑WS /∑CW	λ_{max}
Multiplying each cell of the above matrix with the coefficient weight	0.3147	0.2538	0.4033	0.3020	1.2739	**0.3147**	4.0479	4.0370
	0.2187	0.1764	0.1535	0.1618	0.7104	**0.1764**	4.0275	
	0.2285	0.3365	0.2929	0.3255	1.1835	**0.2929**	4.0404	
	0.2251	0.2355	0.1944	0.2160	0.8709	**0.2160**	4.0320	

Count Check (n) =	**4**	**CI =** $(\lambda_{max}$ - n)/(n-1)	**0.0123**
$(\lambda_{max}$ - n) =	**0.0370**	Tabulated **RI** for the matrix of order 4 =	0.9
(n- 1) =	3	**CI / RI =**	0.013686488
		Consistency Ratio (CR) = CI / RI =	**0.013686488** which is < 0.1

Calculation of Weight of Impact Factors Across Economic Dimension

Rank Matrix

Impact factors across economic dimension	Compensation	Valuation	Mortgage Availability	Transaction Cost	Taxation
Compensation	1.0000	2.2527	3.2079	4.0806	5.1021
Valuation	0.4439	1.0000	2.1764	3.2381	4.2556
Mortgage Availability	0.3117	0.4595	1.0000	2.2903	2.6378
Transaction Cost	0.2451	0.3088	0.4366	1.0000	2.1646
Taxation	0.1960	0.2350	0.3791	0.4620	1.0000
Total	2.1967	4.2560	7.2000	11.0709	15.1602

Normalisation						**Sum**	**Weight**
Compensation	0.4552	0.5293	0.4455	0.3686	0.3365	2.1352	**0.4270**
Valuation	0.2021	0.2350	0.3023	0.2925	0.2807	1.3125	**0.2625**
Mortgage Availability	0.1419	0.1080	0.1389	0.2069	0.1740	0.7696	**0.1539**
Transaction Cost	0.1116	0.0726	0.0606	0.0903	0.1428	0.4779	**0.0956**
Taxation	0.0892	0.0552	0.0527	0.0417	0.0660	0.3048	**0.0610**
Total	1	1	1	1	1		1

Multiplying original rank with the corresponding weight

Coefficient weight	**0.4270**	**0.2625**	**0.1539**	**0.0956**	**0.0610**
Compensation	1.0000	2.2527	3.2079	4.0806	5.1021
Valuation	0.4439	1.0000	2.1764	3.2381	4.2556
Mortgage Availability	0.3117	0.4595	1.0000	2.2903	2.6378
Transaction Cost	0.2451	0.3088	0.4366	1.0000	2.1646
Taxation	0.1960	0.2350	0.3791	0.4620	1.0000

Calculating Consistency Ratio						**Weighted sum (WS)**	**Criteria Weights (CW)**	**∑WS /∑CW**	λ_{max}
Compensation	0.4270	0.5913	0.4938	0.3900	0.3110	2.2132	**0.4270**	5.1826	**5.1114**
Valuation	0.1896	0.2625	0.3350	0.3095	0.2594	1.3560	**0.2625**	5.1655	
Mortgage Availability	0.1331	0.1206	0.1539	0.2189	0.1608	0.7873	**0.1539**	5.1151	
Transaction Cost	0.1047	0.0811	0.0672	0.0956	0.1319	0.4804	**0.0956**	5.0269	
Taxation	0.0837	0.0617	0.0584	0.0442	0.0610	0.3088	**0.0610**	5.0667	

Count Check (n) =	**5.0000**
$(\lambda_{max}$ - n) =	**0.1114**
(n- 1) =	4

CI =	$(\lambda_{max}$ - n)/(n-1)	**0.0278**
Tabulated **RI** for the matrix of order 5		1.1200
CI / RI =		0.024856539
Consistency Ratio (CR) = CI / RI =		0.024856539 which is < 0.1

Calculation of Weight of Impact Factors Across Environmental Dimension

Rank Matrix

Impact factors across environmental dimension	Risk Reduction	Quality of Residential Land	Suitability of Zoning Classification
Risk Reduction	1	2.0838	4.7076
Quality of Residential Land	0.4799	1	2.9418
Suitability of Zoning Classification	0.2124	0.340	1
Total	1.6923	3.424	8.6493

Normalisation

				Sum	Weight
Risk Reduction	0.591	0.609	0.544	1.7438	**0.5813**
Quality of Residential Land	0.284	0.292	0.340	0.9158	**0.3053**
Suitability of Zoning Classification	0.126	0.099	0.116	0.3404	**0.1135**
Total	1.000	1.000	1.000		1

Multiplying original rank with the corresponding weight

Coefficient weight	**0.5813**	**0.3053**	**0.1135**
Risk Reduction	1	2.083756652	4.707553856
Quality of Residential Land	0.479902487	1	2.941769519
Suitability of Zoning Classification	0.212424548	0.339931457	1

Calculating Consistency Ratio

				Weighted sum (WS)	**Criteria Weights (CW)**	**∑WS /∑CW**	λ_{max}
Risk Reduction	0.5813	0.6361	0.5342	1.7515	**0.5813**	3.0133	3.0078
Quality of Residential Land	0.2790	0.3053	0.3338	0.9180	**0.3053**	3.0074	
Suitability of Zoning Classification	0.1235	0.1038	0.1135	0.3407	**0.1135**	3.0026	

Count Check (n) = 3
$(\lambda_{max}$ - n) = **0.007756294**
(n- 1) = 2

CI = $(\lambda_{max}$ - n)/n-1 **0.00387815**
Tabulated **RI** for the matrix of order 3 0.58
CI / RI 0.00668646

Consistency Ratio (CR) = CI / RI = 0.006686461
which is < 0.1

Calculation of Weight of Impact Factors Across Institutional Dimension

Rank Matrix

Impact factors across institutional dimension	Coordination	Subdivision Restriction	Lot Size Control
Coordination	1.0000	2.1842	3.5621
Subdivision Restriction	0.4578	1.0000	2.1843
Lot Size Control	0.2807	0.4578	1.0000
Total	1.7386	3.6420	6.7464

Normalisation

				Sum	Weight
Coordination	0.5752	0.5997	0.5280	1.7029	**0.5676**
Subdivision Restriction	0.2633	0.2746	0.3238	0.8617	**0.2872**
Lot Size Control	0.1615	0.1257	0.1482	0.4354	**0.1451**
Total	1	1	1		1

Multiplying original rank with the corresponding weight

Coefficient weight	**0.5676**	**0.2872**	**0.1451**
Coordination	1.0000	2.1842	3.5621
Subdivision Restriction	0.4578	1.0000	2.1843
Lot Size Control	0.2807	0.4578	1.0000

Calculating Consistency Ratio

				Weighted sum (WS)	**Criteria Weights (CW)**	**∑WS /∑CW**	λ_{max}
Coordination	0.5676	0.6274	0.5170	1.7120	**0.5676**	3.016	3.010
Subdivision Restriction	0.2599	0.2872	0.3170	0.8641	**0.2872**	3.009	
Lot Size Control	0.1594	0.1315	0.1451	0.4360	**0.1451**	3.004	

Count Check (n) = 3

$(\lambda_{max}$ - n) = **0.0095**

(n- 1) = 2

CI = $(\lambda_{max}$ - n)/n-1 **0.0048**

Tabulated **RI** for the matrix of order 3 = 0.58

CI / RI 0.008190473

Consistency Ratio (CR) = CI / RI = 0.008190473

which is < 0.1

Derivation of Weight of Impact Factors Across Social Dimension

Rank Matrix

Impact factors across social dimension	Awareness	Expectation	Proximity
Awareness	1	2.418	7.422
Expectation	0.414	1	3.788
Proximity	0.135	0.264	1
Total	1.548	3.682	12.211

Normalisation				Sum	**Weight**
Awareness	0.6459	0.6567	0.6079	1.9105	**0.6368**
Expectation	0.2671	0.2716	0.3102	0.8489	**0.2830**
Proximity	0.0870	0.0717	0.0819	0.2406	**0.0802**
Total	1.000	1.000	1.000		1

Multiplying original rank with the corresponding weight

Coefficient weight	**0.6368**	**0.2830**	**0.0802**
Awareness	1.00000	2.41827	7.42234
Expectation	0.41352	1.00000	3.78836
Proximity	0.13473	0.26397	1.00000

Calculating Consistency Ratio				**Weighted sum (WS)**	**Criteria Weights (CW)**	∑WS /∑CW	λ_{max}
Awareness	0.6368	0.6843	0.5953	1.9164	**0.6368**	3.0093	3.0049
Expectation	0.2633	0.2830	0.3038	0.8501	**0.2830**	3.0043	
Proximity	0.0858	0.0747	0.0802	0.2407	**0.0802**	3.0012	

Count Check (n) =	**3**	CI = $(\lambda_{max}$ - n)/n-1	**0.002464372**
$(\lambda_{max}$ - n) =	**0.0049**	Tabulated RI for the matrix of order 3 =	0.58
(n- 1) =	2	CI / RI	0.004248917
		Consistency Ratio (CR) = CI / RI =	0.004248917 which is < 0.1

Appendix 8: Rank Correlation Between Local Weight and Composite Weight

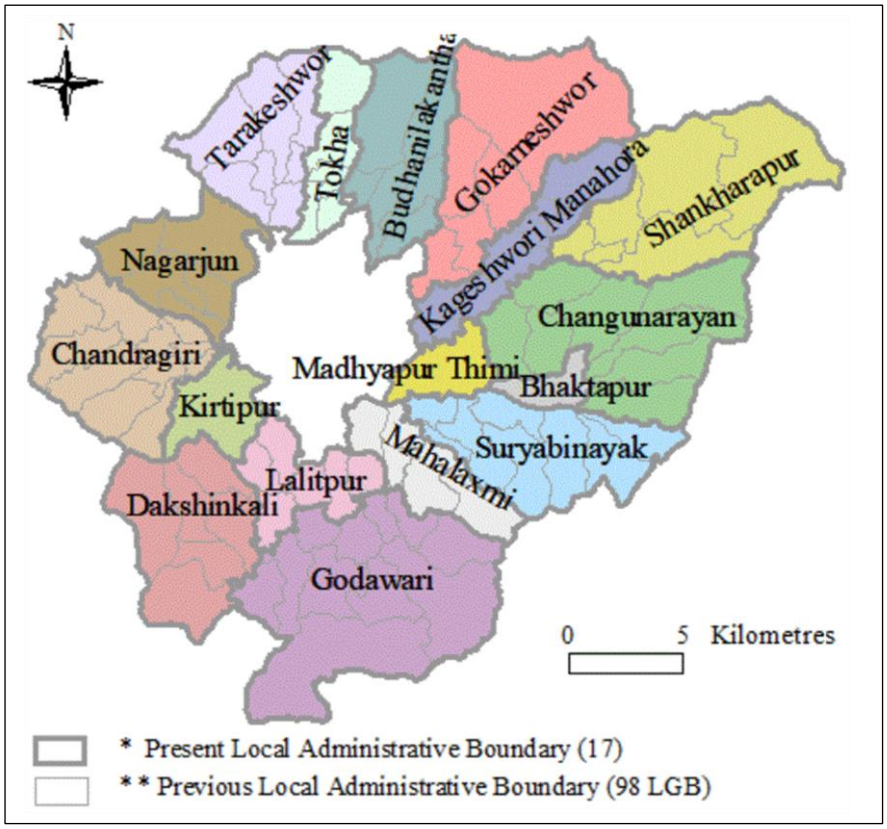
Spearman's correlation coefficient between the normalised local weight of impact factors and its corresponding composite weight

Impact factor	Composite weight	Rank of the composite weight	Local weight	Rank of the normalised local weight	Rank difference (d)	d^2
Risk reduction	0.1703	1	0.1453	2	−1	1
Compensation	0.1344	2	0.1068	4	−2	4
Coordination	0.1226	3	0.1419	3	0	0
Awareness	0.1123	4	0.1592	1	3	9
Quality of Residential Land	0.0894	5	0.0763	5	0	0
Valuation	0.0826	6	0.0656	8	−2	4
Subdivision Restrictions	0.0620	7	0.0718	6	1	1
Expectation	0.0499	8	0.0707	7	1	1
Mortgage Availability	0.0484	9	0.0385	9	0	0
Suitability of Zoning Classification	0.0332	10	0.0284	11	−1	1
Lot Size Control	0.0313	11	0.0363	10	1	1
Transaction Cost	0.0301	12	0.0239	12	0	0
Taxation	0.0192	13	0.0152	14	−1	1
Proximity	0.0141	14	0.0201	13	1	1
					24	24
Spearman's coefficient = 1−(6 Sigma d2 / n3−n), where n is the number of pairs compared **Correlation Coefficient = +0.94**						

Appendix 9: Rank Correlation Between Weights and Impact Score

Spearman's correlation coefficient between the weight of impact factors and corresponding impact score						
Land market Impact Factor	**Mean Impact Score (IMS) for each impact factor**	**Rank of Mean Impact Score**	**Rank of Composite Weight**	**Difference (d)**	**d^2**	**Composite Weight (C_{Wi}) = (Wd * Wi)**
Proximity	-0.2389	12	1	11	121	0.0141
Taxation	-0.5264	11	2	9	81	0.0192
Transaction Cost	-1.2667	4	3	1	1	0.0301
Lot size	-0.9194	7	4	3	9	0.0313
Suitability of Zoning Classificatio n	-0.6361	10	5	5	25	0.0332
Mortgage availability	-1.3722	2	6	-4	16	0.0484
Expectation	-1.3139	3	7	-4	16	0.0499
Subdivision restrictions	-0.9426	6	8	-2	4	0.062
Valuation	-0.9653	5	9	-4	16	0.0826
Quality of Residential Land	1.0278	14	10	4	16	0.0894
Awareness	-0.7889	9	11	-2	4	0.1123
Coordination	-1.5296	1	12	-11	121	0.1226
Compensatio n	-0.8639	8	13	-5	25	0.1344
Risk Reduction	0.3889	13	14	-1	1	0.1703
Total					456	
Spearman's Correlation coefficient 1- (6 Sigma d2 / (n3-n)), where n is the number of pairs compared = -0.002						

Appendix 10: Map of Kathmandu Valley (Representative Land Transaction Area)



* The total number of municipalities as per the present administrative subdivision is 17, including suburbs of Lalitpur metropolis.

** As per the previous administrative division (before 2016), the total number of Local Governing Bodies (LGB) where the representative samples were taken from was 98.

Map Source: Survey Department, 2018

Appendix 11: Correlation Coefficient of Blacklisted Borrowers and NPL

Year	NPL in billion NRs	Blacklisted Borrowers
2015–16	36.8	4790
2016–17	36.1	5252
2017–18	38.5	6241
2018–19	44.2	8620

Correlation Coefficient: NPL and Blacklist: 0.98
Data source: NPL – Financial Stability reports 2015–2019, Nepal Rastra Bank
Blacklisted borrowers – Annual reports 2015–2020, Nepal Rastra Bank

Appendix 12: Correlation Coefficient of Changes in Loan Amount and NPL

Correlation coefficient of the changes in the real estate and residential housing loan amount and NPL

NPL	Real Estate Loan (in billion NRs)	Relative change in real estate lending	NPL (in billion NRs)
2015–16	108.7	23.0	36.8
2016–17	127.3	18.6	36.1
2017–18	142.0	14.7	38.5
2018–19	146.0	4.0	44.2
Correlation Coefficient: NPL and relative change in the real estate lending −0.95 Data source: Financial Stability reports 2015–2020, Nepal Rastra Bank			

Appendix 13: Correlation Coefficient of Blacklisted Borrowers and the Real Estate and Residential Housing Loan

Correlation coefficient between the real estate lending and the blacklisted borrowers		
Fiscal year	**Real estate lending (Rs.)**	**Blacklisted Count**
2015–2016	108.0	4790
2016–2017	127.3	5252
2017–2018	142.0	6241
2018–2019	146.0	8620

Correlation coefficient: Blacklisted borrowers and the real estate and residential housing loan: 0.83

Data source: Financial Stability reports 2015–2020, Nepal Rastra Bank; Blacklisted borrowers – Annual reports 2015–2020, Nepal Rastra Bank

Appendix 14: Correlation Coefficient of the Land Price and Transaction Volume

A correlation between then median land price and transaction volume		
Year	**Total transaction volume**	**Median Land Price**
2012–2013	90943	933100
2013–2014	96699	1043700
2014–2015	97037	1130900
2015–2016	97953	1226400
2016–2017	100633	1312600
2017–2018	74981	1721750
2018–2019	75082	1975300
Correlation Coefficient -0.81 Data source: Department of Land Management and Archive, 2019		

Appendix 15: Correlation Coefficient of the Average Distance and the Households Remaining to be Relocated

Correlation coefficient of the average distance to relocation areas and the households remaining to be relocated

District	Relocated households	Households remaining to be relocated	Average distance to the relocation areas
Makawanpur	26	4	3
Kathmandu	0	16	7
Lalitpur	13	27	8
Solukhumbu	19	30	7
Tanahu	0	1	5
Chitwan	63	39	4
Lamjung	0	56	6
Okhaldhunga	104	108	5
Ramechhap	144	54	4
Dolakha	23	4	2
Dhading	389	44	1
Rasuwa	629	444	4
Sindhupalchok	278	366	5
Kavrepalanchok	39	81	5
Nuwakot	218	205	2
Gorkha	363	785	7

Correlation coefficient: Average distance and the households remaining to be resettled: 0.17
Data source: Nepal Reconstruction Authority 2018

Appendix 16: Correlation Coefficient of the Loan and the Transaction Volume

Correlation coefficient between the changes in the amount of real estate and residential housing loan and the transaction volume

Correlation coefficient between the changes in the credit supplied and the transaction volume		
Year	**Relative Change in the Real Estate Lending**	**Transaction Volume**
2014–2015	23.0	97953
2015–2016	18.6	100633
2016–2017	14.7	74981
2017–2018	4.0	75082
2018–2019	23.0	97953
Correlation Coefficient: Changes in the credit supplied and the transaction volume: 0.79 Data source: Financial Stability reports 2015–2020, Nepal Rastra Bank Department of Land Management and Archive		

Appendix 17: Stakeholder Organisations and Position of the Interview Participants

Group of Stakeholders' Organisation	Organisation and Participants' Position	Number of Participants
Institutional	Department of Land Reform and Management, Director-General	1
	Civil Aviation Authority of Nepal- Director	1
	Department of Urban Development and Building Construction, Director-General	1
	Kathmandu Valley Development Authority, Commissioner	1
	Kathmandu Valley Land Pooling Project, Project Manager	1
	National Land Use Mapping Technical Committee, Member	1
	National Reconstruction Authority, Chief Survey Officer	1
	Cadastral Survey Division, Deputy Director-General	1
	Topographic Survey and Land Use Management Division, Deputy Director-General	1
	Survey Department, Director-General	1
	1. Survey Office, Kathmandu, Chief Survey Officer	2
	2. Survey Office, Lalitpur, Chief Survey Officer	
	1. Land Revenue Office, Kathmandu- Land Revenue Officer	2
	2. Land Revenue Office, Lalitpur Land Revenue Officer	
	1. Ministry of Land Management, Cooperatives and Poverty Alleviation, Secretary	3
	2. Ministry of Land Management, Cooperatives and Poverty Alleviation, Joint Secretary	
	3. Ministry of Land Management, Cooperatives and Poverty Alleviation, Joint Secretary	
	1. Kathmandu and Metropolitan Office, Planning Officer	3
	2. Lalitpur Metropolitan Office, Planning Officer	
	3. Bhaktapur Municipality Office, Planning Officer Bhaktapur	
Private	Independent Power Producers' Association of Nepal- President, IPPAN	1
	Sanima Hydropower - GM/CEO	1
	Survey and Engineering Consultancy- ADMC Engineering Pvt. Ltd., Managing Director	1
	1. Nepal Surveyor's Association, Vice-President	2
	2. Nepal Surveyor's Association, Secretary	
	1. Nepal Land and Housing Developers' Association, Vice President	2
	2. Nepal Land and Housing Developers' Association, Executive Member	
	1. Padma Colony, Sitapaila, General Manager	3
	2. Shangrila Housing Pvt. Ltd., Gothatar, General Manager	
	3. Sunrise Developers Pvt. Ltd, General Manager	
	1. Professional Legal Lekhapadhi Association of Nepal, Chairman	3
	2. Professional Legal Lekhapadhi Association of Nepal, General Secretary	
	3. Professional Legal Lekhapadhi Association of Nepal, Executive Member	
	1. Real Estate Agent Association, Nepal, President	3
	2. Real Estate Agent Association, Nepal, General Secretary	
	3. Real Estate Agent Association, Nepal, Member	
	1. Local Land Expert, Ex-Director General Survey Department	4
	2. Local Land Expert, Ex-Director General Survey Department	
	3. Local Land Expert, Ex-Director General Survey Department	
	4. Local Land Expert, Ex-Chief Survey Officer of Survey Department	
Bank and Financial Institutions	1. Nepal Rastra Bank, Director	1
	1. Bank of Kathmandu Ltd., Kamal Pokhari, General Manager	19
	2. Everest Bank Limited, Lazimpat, Kathmandu, General Manager	
	3. Sunrise Bank Nepal, Gairidhara, Kathmandu, General Manager	

Group of Stakeholders' Organisation	Organisation and Participants' Position	Number of Participants
	4. Prabhu Bank Ltd., Babar Mahal, Kathmandu, General Manager	
	5. NIC Asia Ltd., Thapathali, Kathmandu, General Manager	
	6. Sanima Bank Ltd., Nagpokhari, Kathmandu, General Manager	
	7. Prime Commercial Bank Ltd., Kamal Pokhari, Kathmandu, General Manager	
	8. Standard Chartered Bank Ltd, New Baneshwor, Kathmandu, General Manager	
	9. Nepal SBI Bank Ltd., Kesha Mahal, Kathmandu, General Manager	
	10. Rastriya Banijya Bank, Singhdurbar Plaza, Kathmandu, General Manager	
	11. Nepal Investment Bank Ltd., Durbar Marg, Kathmandu, General Manager	
	12. Siddhartha Bank Ltd., Hattisar, Kathmandu, General Manager	
	13. Nepal Credit and Commerce Bank Ltd., Bagbazar, Kathmandu, General Manager	
	14. Nepal Bangladesh Bank Ltd., Kamaladi Kathmandu, General Manager	
	15. Machhapuchhre Bank Ltd., Lazimpat, Kathmandu, General Manager	
	16. Kumari Bank Ltd., Tangal, Kathmandu	
	17. Himalayan Bank Limited Ltd., Thamel, Kathmandu	
	18. Nabil Bank Limited, Durbar Marg, Kathmandu	
	19. Laxmi Bank Ltd., Hattisar, Kathmandu	
	Total	60

Appendix 18: Stakeholder Organisations and Position of the Survey Participants

A. Institutional Group

Survey Participants Organisations and Positions	Number of Participants
Department of Land Management and Archive, Under-Secretary	1
Department of Urban Development and Building Construction, Undersecretary	1
Civil Aviation Authority of Nepal, Director	1
Department of National Parks and Wildlife Conservation, Planning and Management Section, Under Secretary	1
High-Powered Committee for Integrated Development of the Bagmati Civilisation, Planning Officers	1
Geographic Information Infrastructure Division Nepal, Survey Officer	2
Kathmandu Valley Development Authority, Planning Officers	2
National Reconstruction Authority, Re-settlement Section, Resettlement Officer	2
Topographical Survey and Land Use Management Division	2
Nepal Institution of Chartered Surveyors, Member	3
Ministry of Land Management, Cooperatives and Poverty Alleviation, Under-secretary, Planning and Coordination Division; Under-secretary, Land Management Division; Under-secretary Administration, Cooperatives and Poverty Alleviation Division	3
Cadastral Survey Division, Survey Officers	4
Bagmatiphant (II) Land Pooling Project, Lalitpur, Planning Officer	1
Kamerotar Land Pooling Project, Bhaktapur, Planning Officer	1
Mulpani Land Pooling Project, Mulpani, Kathmandu, Planning Officer	1
Dibyeswori Land Pooling Project, Madhyapur Thimi, Bhaktapur, Planning Officer	1
Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR), Under Secretary	1
Nepal Army, Lieutenant Colonel	1
Central Bureau of Statistics, Chief Statistics Officer	1
Ministry of Agriculture Development, Under Secretary	1
Chandragiri Municipality, Planning Officer	1
Tokha Municipality, Planning Officer	1
Nagarjun Municipality, Planning Officer	1
Godavari Municipality, Lalitpur, Planning Officer	1
Mahalaxmi Municipality, Lalitpur, Planning Officer	1
Suryabinayak Municipality, Bhaktapur, Planning Officer	1
Changunarayan, Bhaktapur, Planning Officer	1
Land Revenue Office, Sankhu, Chief Land Revenue Officer	1
Land Revenue Office - Kalanki, Chief Land Revenue Officer	1
Land Revenue Office -Kalanki, Land Revenue Officer	1
Land Revenue Office- Sankhu, Land Revenue Officer	1
Land Revenue Office - Tokha, Land Revenue Officer	1
Land Revenue Office - Chabahill, Land Revenue Officer	1
Land Revenue Office- Bhaktapur, Land Revenue Officer	1
Land Revenue Office- Lalitpur, Land Revenue Officer	1
Land Revenue Office- Dillibazar, Land Revenue Officer	1
Land Revenue Office- Manamaiju, Land Revenue Officer	1
Land Revenue Office- Lele, Lalitpur, Land Revenue Officer	1
Survey Office- Chabahill, Chief Survey Officer	1
Survey Office- Kalanki, Kathmandu, Chief Survey Officer	1
Survey Office- Tokha, Kathmandu, Survey Officer	1
Survey Office- Sankhu, Kathmandu, Survey Officer	1
Survey Office-- Kalanki, Kathmandu, Survey Officer	1
Survey office- Chabahill, Kathmandu, Survey Officer	1
Survey office- Bhaktapur, Survey Officer	1
Survey office- Lalitpur, Survey Officer	1
Survey office- Dillibazar, Kathmandu, Survey Officer	1
Survey office- Manamaiju, Kathmandu, Survey Officer	1
Survey office- Lele, Lalitpur, Survey Officer	1
Total	60

B. Private Group

Survey Participant's Organisations and Positions	Number of Participant
Independent Power Producers' Association of Nepal (IPPAN)- Executive Member	2
Real Estate Agent Association Nepal (REAAN)-General Member	3
Nepal Land and Housing Development Association (NLHDA), Executive Member	3
Nepal Surveyors' Association (NSA)- Executive Member	3
Rajdevi Engineering Consultancy, General Manager	1
Geo-Consult Pvt. Ltd, Baneshwor, General Manager	1
Nest Consultancy, Thamel, General Manager	1
ERMC Consultancy Pvt. Ltd., Old Baneshwor, General Manager	1
Rass engineering Consultancy, Sankhamul, General Manager	1
Ex-Chief Land Revenue Officer, DOLRM/DOLMA	6
Thapa Property Dealers, General Manager	1
Sunkoshi Realtors, Koteswor, General Manager	1
Kasthamandap Real Estate, General Manager	1
Shrestha Real Agents, General Manager	1
Sagarmatha Property Dealers, General Manager	1
Bagamti Housing and Land Suppliers, General Manager	1
Land Supply Pvt. Ltd, General Manager	1
Kharel Real Estate Agency, General Manager	1
Sunsari Land and Housing Traders, General Manager	1
1. Kankai Awas Co. Pvt. Ltd., Nangkhel, Bhaktapur, General Manager	1
2. Jayanti Awas K. Pvt. Ltd., Bhaktapur, General Manager	1
3. Nikoshera Jagga Vikash, Madhynapur Thimi, Bhaktapur, General Manager	1
4. Rodsho Real Estate PVt. Ltd (Second Phase), Changunarayan, Bhaktapur, General Manager	1
5. Kamalvinayak City View Colony, Bageswori, Bhaktapur, General Manager	1
6. Shree Homeland Housing Pvt. Ltd., Madhyapur Thimi, Bhaktapur, General Manager	1
7. Bagmati Property Dealers, Balkot, Bhaktapur, General Manager	1
8. Jhaukhel Awas Company, Jhaukhel, General Manager	1
9. CR housing Pvt Ltd, Bhaktapur, General Manager	1
10. Mega Estate Pvt Ltd, Sita Paila, Kathmandu, General Manager	1
11. Platinum Developers Kathmandu 14, General Manager	1
12. Bivor Properties, Kathmandu 15, General Manager	1
13. C.E. Constructions, Khadkabhadrakali, General Manager	1
14. Kotse Bhairav Pvt. Ltd, Ramkot, Kathmandu, General Manager	1
15. Hill View Housing, Imadol, Lalitpur, General Manager	1
16. GreenHill City, Mulpani, Kathmandu, General Manager	1
17. Silver Valley Developers, Dillibazar, Kathmandu, General Manager	1
18. Vinayak Property Pvt Ltd., Budhanilkantha, Kathmandu, General Manager	1
19. Brihat Investment Pvt. Ltd., Balkhu, Kathmandu, General Manager	1
20. Polis Apartment, Samakhushi, Kathmandu, General Manager	1
21. Makhmali Housing, Gongabhu, Kathmandu, General Manager	1
22. CG Developers Pvt. Ltd, Mahankaal, Kathmandu, General Manager	1
23. RKH Developers Pvt. Ltd, KTM 10, General Manager	1
24. Nandan Developers, Putalisadak, General Manager	1
25. Malingo International, Kageshowri, Manohara, General Manager	1
26. Mount View Developers Pvt. Ltd, Saibu, Lalitpur, General Manager	1
27. The Comfort Housing Pvt. Ltd., Thaiba, Lalitpur, General Manager	1
28. CG Properties Pvt Ltd., Dhapakhel, Lalitpur, General Manager	1
29. Hill View Housing, Imadol, Lalitpur, General Manager	1
Total	60

C. Financial Group

Survey Participant's Organisations and Positions	Number of Participants
Nepal Rastra Bank (Federal Reserve Bank of Nepal)-Deputy Director	2
Bank of Kathmandu Ltd., Jawalakhel, Lalitpur, Loan Officer	1
Bank of Kathmandu Ltd., New Road, Kathmandu, Loan Officer	1
Everest Bank Limited, Lazimpat, Kathmandu, Loan Officer	1
Everest Bank Limited, New Baneshwor, Kathmandu, Loan Officer	1
Himalayan Bank Limited Ltd., Shukuldhoka, Loan Officer	1
Kumari Bank Ltd., Jagati, Loan Officer	1
Kumari Bank Ltd., Tangal, Kathmandu, Loan Officer	1
Laxmi Bank Ltd., Hattisar, Kathmandu, Loan Officer	1
Laxmi Bank Ltd., Sallaghari, Bhaktapur, Loan Officer	1
Machhapuchhre Bank Ltd., Lazimpat, Kathmandu, Loan Officer	1
Machhapuchhre Bank Ltd., Kamalbinayak, Loan Officer	1
Nabil Bank Limited, Durbarmarg, Kathmandu, Loan Officer	1
Nabil Bank Limited, Kaushaltar, Bhaktapur, Loan Officer	1
Nepal Bangladesh Bank Ltd., Chyamasingh, Bhaktapur, Loan Officer	1
Nepal Bangladesh Bank Ltd., Kamaladi Kathmandu, Loan Officer	1
Nepal Credit and Commerce Bank Ltd., Bagbazar, Kathmandu, Loan Officer	1
Nepal Credit and Commerce Bank Ltd., Kharipati, Loan Officer	1
Nepal Investment Bank Ltd., Balkot, Bhaktapur, Loan Officer	1
Nepal Investment Bank Ltd., Baluwatar, Kathmandu, Loan Officer	1
Nepal Investment Bank Ltd., Durbar Marg, Kathmandu, Loan Officer	1
Nepal SBI Bank Ltd, Boudhha Marga, Kathmandu, Loan Officer	1
Nepal SBI Bank Ltd, Keshar Mahal, Kathmandu, Loan Officer	1
NIC Asia Ltd., Bhainsepati, Loan Officer	1
NIC Asia Ltd., Bhaktapur, Loan Officer	1
NIC Asia Ltd., Thapathali, Kathmandu, Loan Officer	1
Prabhu Bank Ltd., Babar Mahal, Kathmandu, Loan Officer	1
Prabhu Bank Ltd., Balkot, Bhaktapur, Loan Officer	1
Prabhu Bank Ltd., Lalitpur, Loan Officer	1
Prime Commercial Bank Ltd, Chuchepati, Kathmandu, Loan Officer	1
Prime Commercial Bank Ltd, Surya Binayak, Bhaktapur, Loan Officer	1
Prime Commercial Bank Ltd., Kamalpokhari, Kathmandu, Loan Officer	1
Rastriya Banijya Bank, Madhyapur Tihmi, Bhaktapur, Loan Officer	1
Rastriya Banijya Bank, Singhadurbarplaza, Kathmandu, Loan Officer	1
Sanima Bank Ltd., Gongabu, Kathmandu, Loan Officer	1
Sanima Bank Ltd., Konjyosom, Lalitpur, Loan Officer	1
Sanima Bank Ltd., Nagpokhari, Kathmandu, Loan Officer	1
Siddhartha Bank Ltd., Hattisar, Kathmandu, Loan Officer	1
Standard Chartered Bank Ltd, Jawalakhel, Lalitpur, Loan Officer	1
Standard Chartered Bank Ltd, New Baneshwor, Kathmandu, Loan Officer	1
Sunrise Bank Nepal, Teku, Kathmandu, Loan Officer	1
Sunrise Bank, Kapan, Kathmandu, Loan Officer	1
Sunrise Bank, Sukuldhoka, Bhaktpur, Loan Officer	1
Nepal Bangladesh Bank Ltd., Bhainsepati, Lalitpur, Loan Officer	1
Capital Merchant Banking & Finance Ltd, Battisputali, Kathmandu, Loan Officer	1
Central Finance Ltd., Kupondole, Lalitpur, Loan Officer	1
Chhimek Laghubitta Bittiya Sanstha Ltd., Old Baneshwor, Kathmandu, Loan Officer	1
Civil Laghubitta Bittiya Sanstha Ltd., Chuchepati, Kathmandu, Loan Officer	1
First Microfinance Laghubitta Bittiya Sanstha Ltd., Gyaneshwor, Kathmandu, Loan Officer	1
Goodwill Finance Ltd., Hattisar, Kathmandu, Loan Officer	1
Gorkhas Finance Ltd., Dillibazar, Kathmandu, Loan Officer	1
Guheshwori Merchant Banking & Finance Ltd., Pulchowk, Lalitpur, Loan Officer	1
Laxmi Lighubitta Bittiya Sanstha Ltd., Maharajgunj, Kathmandu, Loan Officer	1
Manjushree Finance Ltd., New Baneshwor, Kathmandu, Loan Officer	1
Nirdhan Utthan Laghubitta Bittiya Sanstha Ltd., Naxal, Kathmandu, Loan Officer	1
Progressive Finance Ltd., Newroad, Kathmandu, Loan Officer	1
RMDC Laghubitta Bittiya Sanstha Ltd., Putalisadak, Kathmandu, Loan Officer	1
Sana Kisan Bikas Laghubitta Bittiya Sanstha Ltd., Babar Mahal, Kathmandu, Loan Officer	1
Swabalamban Laghubitta Bittiya Sanstha Ltd., Kamal Pokhari, Kathmandu, Loan Officer	1
Total	60