The Role of Property Rights for Land Degradation and Land Use Conflicts. The Case of Wetland in Gujranwala (Pakistan)

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To my father, my late mother and my sisters

Table of Contents

List of Tables

List of Figure

List of Abbreviations

APFED:	Asia Pacific Forum for Environment and Development
BFFP:	Board of Forestry and Fire Protection (California)
BLM:	Bureau of Land Management
Ca:	Calcium
CC:	Climate Change
DOR:	District Officer Revenue
ESCWA:	Economic and Social Commission for Western Asia
ESP:	Exchangeable Sodium Percentage
FAO:	Food and Agriculture Organization
FARA:	Forum of Agricultural Research in Africa
FHI:	Family Health International
GACGC:	German Advisory Council for Global Change
GDP:	Gross Domestic Product
GEF:	Global Environment Facility
GHE:	Green House Effect
GT Road:	Grand Trunk Road
ICARRD:	International Conference on Agricultural Reforms and Rural Development
IFPRI:	International Food Policy Research Institute
ISRIC:	World Soil Information Database
IWMI:	International Water Management Institute
LDA:	Lahore Development Authority
LUCID:	Land-use Change; Impacts and Dynamics
Na:	Sodium
NCSRC:	National Conservation Strategy and Resource Center
NSF:	National Science Foundation
OECD:	Organization for Economic Co: operation and Development
OLS:	Ordinary Least Square
OMC:	The Oregon Mediation Center
PALM:	Pamir and Pamiralai Land Management
pH:	Measure of the concentration of Hydrogen ion in a solution

PIDE: Pakistan Institute of Development Economics

POPIN: United Nations Population Information Network

R^2: Co-efficient of Determination

SAR: Sodium Absorption Ratio

SUPARCO: Pakistan Space and Upper Atmospheric Research Council

SWIMPP: Surface Water, Industrial and Municipal Pollution in Punjab

ULE: Urbanization, Land-use, Land Degradation and Environment

UNCCD: United Nations Convention to Combat Desertification

UNDP: United Nations Development Program

UNECE: United Nations Economic Commission for Europe

UNEP: United Nations Environment Program

UNESCAP: United Nations Economic and Social Commission for Asia and the Pacific

UNESCO: United Nations Educational, Scientific and Cultural Organization

UNHABITAT: United Nations Human Settlement Program

UN: United Nations

UNU: United Nations University

USAID: United States Agency for International Development

WB: The World Bank

WMO: World Meteorological Organization

WRI: World Resource Institute

WRM: World Rain-fed Management

WWF: World Wildlife Fund

1 Introduction

Land degradation has been a major global issue during the twentieth century and will remain high on the international agenda in the twenty-first century. The importance of land degradation among the more serious global issues is enhanced because of its impact on World food security and the quality of the environment. Degradation is the result of a number of interrelated factors that end in land that is chemically or physically too badly degraded for productive use. Stocking and Murnaghan (2000: 7) have stated that land degradation is an overarching phenomenon that describes a change in one or more components of land such as soil, water, vegetation, rocks, air, climate, or relief and cannot be identified as a single attribute. It involves loss in the form of biological or economic productivity and complexity of the different types of land such as rain-fed or irrigated cropland, range, pasture, forest, and woodlands. This may occur as the result of various natural processes, e.g., (i) soil erosion caused by wind and/or water; (ii) the deterioration of the physical, chemical, and biological or economic properties of soil; and (iii) the long-term loss of natural vegetation through uncontrolled overgrazing (Coxhead and Oygard 2007: 142). At the same time, land degradation might be attributable to anthropogenic factors; mismanagement and the usage of agricultural land for urbanization are examples of degradation of land by man. The conversion of land from high production of biomass to urban uses with low production of biomass is consider as economically beneficial, and yet the accompanying reduction in biomass can also be taken as land degradation (Johnson and Lewis 2007: 164).

Land degradation because of urban usage is caused by the physical expansion of cities, which is the result of migration from rural to urban areas. This increase in the population of cities requires the creation of housing, transportation, and industry, all of which put pressure on land use, and often natural lands are disturbed, and vegetation is lost. Sometimes technological developments alter the usefulness of various natural resources, e.g., the development of new infrastructure may lead to over exploitation leading to land degradation (Brower and Chadwich 1991: 7). Because of this anthropogenic modification of the ecosystems, the quality of land is degraded over time leading to a reduction in biodiversity (Joseph et al. 2004: 1, 28).

Land degradation can also result from poor land-use planning. In most countries, the competition of land use for economic development results in conflict of interests. These may

be attributable to financial or legal incentives of landowners, leading to wrong decisions on land use and overexploitation of land resources; for instance, enhanced production through the use of chemical fertilizers, insecticides, pesticides, and raw sewage/wastewater has frequently compromised land and groundwater quality. The results of such decisions take the form of the damage and degradation of valuable land (Alan 2009: 1).

Land degradation associated with a decrease in production is not in the interest of farmers (Stocking and Murnaghan 2000: 11). This becomes more critical when such degradation greatly limits land management in rural areas. Effective access to land resources and secure land-use rights can provide an essential incentive for farmers to invest in sustainable land-use practices for agriculture. In most of the developing countries, ownership rights and regulation of the land are unclear. Different investors wish to take over land from landowners because of the ambiguity in these laws. Such ownership and land-use rights are of particular importance, especially for countries where agriculture is the backbone of economic development, for example, Palestine, China, Bangladesh, and Pakistan.

Considering the case of Pakistan, its economy is based mainly on the agricultural sector, with cotton and rice being the major cash crops.[1] To achieve higher production, the farmers have overexploited soil and water resources, the latter being high in salinity, and the poor soil and water management ultimately lead to the soils becoming saline and waterlogged (Niazi 2003: 1). Small landowners also over-utilize their land to cover their daily family expenses and sometimes rent their land or sell it for non-agricultural purposes (such as brick-making or soil use as land-fill in other areas), and hence, good quality surface soil with relatively high organic matter is lost. Currently, some examples of land degradation have been observed in the northeast part of Punjab,[2] which is the largest rice growing area in Pakistan. Some of these areas have become increasingly unproductive because of land degradation, the reasons for this degradation being either natural or artificial.[3] Despite its critical importance to growth, exports, income, and food security, rice cultivation in these areas, because of such land degradation problems, has suffered from a secular decline.

[1] A readily saleable crop (such as cotton or tobacco) produced or gathered for market. (by Paulgrow)
[2] Study Region
[3] Soil Fertility Report 2005

A major part of this wetland[4] is owned by private owners who enjoy complete rights on their land according to the constitution of Pakistan. However, most of the owners are poor and illiterate,[5] with little awareness of land-use rights and the exercise of any power (Khan 2006).

Pakistan's property rights system has several loopholes; for example, according to the transfer of property act 1882, irregular sales of immovable properties do not need to be documented (Alam 2006: 1331). The constitution provides the facility of power of attorney under the stamp act 1899. Landowners can transfer all or some specific rights according to the conditions of the contract to another person in certain situations.[6] In the case of land distribution among heirs, they sometimes avail themselves of this facility to transfer rights to attorneys. Through the anomalies of law and with the help of the authorities,[7] some attorneys create a scenario whereby the landowners are deprived of using their land, whereas other individuals, termed "actors" (other farmers, constructors, industrialists, and government officials), who are rent seekers with an influence on policy decisions, are active in these areas purely for their own interests (Khan 2006). Additionally, the corruption of public servants is an undeniable fact (Khan 2006). For example, Khan (2006) has identified several cases of corruption in the Lahore Development Authority (LDA), which is the main registration authority in Lahore.[8] In this situation, local farmers and land owners are not in a position to decide about the use of their land.

Since Pakistan is an agriculture-based economy, it is vital to safeguard and promote the use of its arable land. It is also worthwhile to state here that approximately sixty five percent of the population lives in rural areas in Pakistan[9] and is fully involved in the agricultural sector. For this reason, the need of highlighting property rights on land is imperative.

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[4] According to the definition of the wetland mapping and classification methodology of Queensland (1999), wetlands are areas of permanent or periodic/intermittent inundation, with water that is static or flowing (fresh, brackish, or salt), including areas of marine water, the depth of which at low tide does not exceed 6 meters. To be classified as a wetland, the area must have one or more of the following attributes: (i) at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or (ii) the substratum is predominantly undrained soils that are saturated, flooded, or ponded long enough to develop anaerobic conditions in the upper layers, or (iii) the substratum is not soil and is saturated with water or covered by water at some time.

[5] According to the data of the Economic Survey of Pakistan 2008-09, illiteracy in rural areas is 51 percent.

[6] Rule of power of attorney is explained in detail in chapter 5

[7] Land record holders (Patwari)

[8] Khan has carried out her investigation in the Provincial Capital of Punjab, Pakistan.

[9] Source: Economic Survey of Pakistan 2008-09

1.1 Objectives

The main objective of the present study is to analysis and understand the reasons for institutional change in the case of the study regions in Pakistan that have experienced land degradation and conflicts among the various actors, such as land users, investors, and the local Government, all of which are concerned with land use and land reclamation and to recommend institutional changes.

The aims of the study are:

- Investigation of the practice of property rights in the study region.
- Analysis of the land-use conflicts between different actors, e.g., farmers, land users, and the rent seekers.

The causes of land degradation will be revealed, and linkages will be developed to the proposed institutional changes. This should breach the gap between proper farm-land use and the behavior of the other actors in order to reduce conflicts regarding land usage. This work will provide answers to the following questions.

1. What are the impacts of land distribution rights implemented in the region?
2. Do these laws cause land degradation?
3. What sorts of conflict exist among the different actors, mainly landholders and land users, for land use causing land degradation?

1.2 Theoretical Approach

The theoretical approach includes the investigation of land degradation as a problem and the constraint for proper land usage of some areas of Pakistan, while evaluating how property rights work to reduce land degradation. The analysis will be based on the distributional theory of institutional change and the theory of property rights.

Distributional theory of institutional change explains institutions as a structured set of rules for social interaction and social conflicts about distribution. These set of rules often have different distributional repercussions, so that every actor behaves in a different manner in favor of the emergence of different rules. In this theory, asymmetries of power are kept at the focal point. To gain maximum benefits from the institutional effects for the complex structure of family, these power asymmetries are used to demonstrate the conflict distribution of the land in intergeneration. Any actor who has a stronger power of bargaining than the others can

affect the rules for the others. Competition plays an effective role on relative bargaining power, as initially introduced rules are more symmetric and then gradually change toward an asymmetry of resources in societies (Knight 1995[10], Theesfeld 2004: 74).

Theory of property rights deals with resource allocation and explains conflicts based on the economic interest and bargaining power of the actors involved in the procedure of allocation of these resources. These distributional conflicts can be intensified if there are known serious asymmetries between the competing actors for the individual claims (Libecap 1989). In the case of these conflicts, an environment for the property rights to land and a land reform clash has emerged. The conflicts, because of the inconsistency between the law and constitutional provision, cause land degradation (Alston et al. 2000: 176).

The Institutions of Sustainability (IoS) is used as an analytical framework for analyzing the institutions relevant to land degradation. This framework analyzes the relationships between the properties of transactions, the characteristics of actors, property rights, and governance structure (Hagedorn et al. 2002). In this study, a framework is built up for the analysis of the land degradation situation in Pakistan based on the IoS. This framework consists of four components: 1) Characteristics of land of the particular region, 2) an action arena in which local actors (farmers, landowners, and others from interest groups) perform different actions on the land for a particular outcome, 3) a property rights system implemented in the region, 4) the governance structure regarding land registration, land transfer, and land contracts in the case of power of attorneys. In this framework, the above-mentioned theories are included to determine the impact of property rights and land-use change on land degradation.

1.3 Methodological Approach and Empirical Setting

The study is based on data collected from Pakistan, a country with a total land area of about 803,940 square kilometers, of which sixty percent is not usable for forestry or agriculture because of deserts, mountain slopes, and urban settlements. Punjab is the largest province with a maximum growing area of seventy percent, followed by almost seventeen percent in Singh, less than ten percent in Khyber Pakhtunkhua (North-West Frontier Province NWFP), and only four percent in Balochistan.[11] Punjab is the major contributor to the agriculture

[10] Knight explains power distribution in terms of wealth, means a wealthy person can affect the bargaining to get more.

[11] Source: Provincial Agriculture Departments of Pakistan 2007-08

industry in Pakistan, but substantial amounts of farmland have been lost because of various reasons including land degradation attributable to soil salinity and sodicity, land fragmentation, and the negligence of landowners (Main and Javeed 1993: 1). In these perspectives, the implementation of additional irrigation and drainage projects to reclaim degraded lands and to bring marginal lands into cultivation is needed. However, since the early 1990s, factors such as rain fall reduction and distribution, waterlogging, and urbanization have increased the area of degraded lands.

To observe the role of property rights on land degradation and to seek the various conflicts among the different actors in Pakistan, a case study approach was followed. Qualitative data was collected from three different regions selected on three bases; 1) condition of land, 2) conflicts between different actors, and 3) geographic location of the region. Among these three regions, 20 villages were visited, which were randomly selected. To accomplish such an important study, a questionnaire was prepared to conduct and record information from interviews with the administrative authorities, personnel in ministries, local actors (land owners and land users), and other individuals (real estate builders and industrialists) in these regions. Some documents related to the present study were also collected from other offices.

1.4 Structure of the Study

Following this introductory chapter, an outline of the whole research study is presented. *Chapter two* describes land degradation as the focus of the study and provides an explanation of the term "land degradation". First, a definition of land is given with various perspectives, and then the different reasons for land degradation, such as natural factors and human factors, are explained. In this chapter, various causes of land degradation such as desertification and deforestation at the World level and at the continent level are discussed. Subsequently, land degradation in Pakistan is discussed in detail, followed by a brief summary together the conclusion.

Chapter three presents complementary theories for the analysis of land degradation based on the concept of institutions and other relevant terms such as formal and informal institutions, norms and culture, property rights and transaction costs, and property right regimes. Arguments from various scholars for the emergence or change in property rights

have been quoted in this chapter. It provides a comprehensive review of relevant theories from the area of the "New Institutional Economics of property rights" for intergenerational land distribution and conflicts on the basis of land use among different actors. With the help of these theories, a suitable framework for the institutional analysis of land degradation is developed.

Chapter four justifies the choice of the selection of the study design and methodological aspects for the research, including a description of the case study sites. It starts with a general discussion of the research design and an explanation of the specific strategy used for this study. Techniques employed for the collection of the data for this study are also explicitly described in this chapter. This chapter also describes the procedure of selection of the case study regions and the households for the analysis of land degradation.

Chapter five is related to the empirical setting and to the land administration and legislation structure of Pakistan. This chapter familiarizes the readers with the legislative structure for inheritance, as implemented in Pakistan, together with some other laws for the understanding of land distribution among heirs. The second part of this chapter provides an introduction to land-use change and environmental laws, in order to explain the land-use pattern. The last part of this chapter describes the agricultural reforms related to the study and is followed by a brief summary and conclusion.

Chapter six focuses on the effects of property rights on land degradation. This chapter aims to investigate the impacts of land distribution rights in the region and the way that land is degraded by virtue of these rights by using the IoS framework. This chapter also explores the land distribution conflicts as a cause of land degradation in the region.

Chapter seven is the second chapter of results and explains the role of land-use change and conflicts related to these changes among the various users in the case of land degradation. This chapter also tries to explain the relationship between two different types of conflicts, viz., land-use change conflicts and land distribution conflicts, and finally explains the relationship of these two conflicts with the study problem 'land degradation'

Chapter eight is the conclusion of the whole study. This chapter synthesizes the major findings and conclusions, plus recommendations from this study.

Chapter nine summarizes the study and shows the main findings of each chapter.

2 Land Degradation: The Problem of the Study

2.1 Introduction

Agriculture is by far the largest sector of Pakistan's economy with a strong influence and linkages with all other sectors. It employs a forty five percent share to the overall labor force and contributes twenty two percent to the national gross domestic product (GDP). This sector is the bastion for the rural population. Cotton and rice are the major exports acquired mainly from the Indus river plain in Sindh and Punjab. Despite favorable conditions for agriculture, Pakistan is far from its full potential level of production; even the Indus plain is not fully utilized (Blood 1994). Among many constraints limiting agricultural production in Pakistan, land degradation is seen as one of the main reasons, and almost sixty one percent of its total agricultural land is affected by various levels of, for example, soil salinity, sodicity, and waterlogging, which is third in ranking among South Asian counties.

Agricultural production, particularly rice output in the study region, is under some strain, with a decline following the green revolution (Jahangir and Ali 1997: 25) because of land degradation (Mustafa 1991), which is the main cause of shrinking resource based for agriculture. The volume of rice exports has declined over the last ten years, and specifically in 2000, a sudden decline occurred of fifty percent (Gilani 2009: 3), possibly because of land degradation, which is a large problem in these rice producing areas. Pakistan is bearing the costs of a reduction of two percent of its GDP or seven percent of its agricultural output attribuTable to land degradation (Shah and Arshad 2006: 1). This shows that it is worthwhile to analyze the reasons for land degradation in these regions.

This chapter presents the topic of land degradation as the problem under study, together with a detailed explanation of land in Section 2.2. A relevant review of the literature is provided to explain the concept and meaning of the term "land degradation", which is further explained in Section 2.3. Section 2.4 focuses on the reasons for land degradation at the World level, whereas Sub-sections 2.4.1 and 2.4.2 elaborate briefly the situation in Asia and South Asia with regard to land degradation. Section 2.5 summarizes the situation in Pakistan and briefly discusses the causes and the history of land degradation in Pakistan. This is followed by a summary and conclusion in Section 2.6.

2.2 Land: Meaning and Definition

Land is an important component of a wider environment in which animals and plants live. Soil and land are defined from different points of view; the following are the key definitions for both terms. Soil is the unconsolidated mineral or organic material at the surface of the Earth, capable of supporting plant life (Bridges 1977: 2). The concept of land covers the whole meaning of the land surface together with all those physical characteristics that are essential for the livelihood of a human being (Christian 1958: 28). The term land can also be defined in other ways; for instance, “Land and land resources refer to a delineable area of the Earth's terrestrial surface, encompassing all attributes of the reserve, the plant and animal populations and the human settlement pattern. It also includes physical results of past and present human biosphere immediately above or below this surface, including those of the near-surface, climate, and the soil and terrain forms. This term also encompasses the surface hydrology (including shallow lakes, rivers, marshes and swamps), the near-surface sedimentary layers and associated groundwater and geohydrological activity (terracing, water storage or drainage structures, roads, buildings" (FAO 1995a, FAO/UNEP 1997b: 1).

In simple terms, land can be explained as that part of the Earth that is not covered by water; hence, everything associated with the soil, air, and rocks, on the surface, below the surface, natural or added by man can be taken as part of the land. Land can also be defined as the combination of soil, water, vegetation, landscape, and microclimate components of an ecosystem (IFPRI 2006: 1). From the above perspectives, land can be considered as a "community" of soil and air, on and under the surface water, with natural or man-made habitats. A disturbance of this community may therefore reduce the efficiency of the land.

Different stakeholders interested in land or direct users of land hold different attitude towards land; for instance, it has generally been considered as a gift from God as it has played a central role in the life of human beings from the times of the earliest civilizations. Economists have their own perception of land, as it has been a continuous source of wealth, power, and social prestige for its owners for millennia. People struggle to own land to improve their living standards, social acceptance, and personal satisfaction. Land is used for various economic developmental activities in order to provide better human conditions. Economists also consider land as being a factor of production, but as being limited in its occurrence and immovable but essential (Gaffney 2004: 3).

Land has diverse uses, for example, the use of land in the production of agricultural and biotic material for human consumption, such as food, fiber, and fuel. Land is also used in the production of energy, the flow of surface and ground water, and the storage of minerals and fossils, and is an important resource base for settlements, industry, and recreation (FAO 1999: 1). The above discussion clearly illustrates that land is "consumed" as a factor of production and for human satisfaction; however, if such "consumption" is not properly managed or is unsustainable, this may lead to a degradation of lands to a level making it impossible to exploit them to their full potential for agricultural and environmental services.

Institutional economics considers land as property, and this can be explained on the basis of its own specificity, which is characterized by spatial distribution, knowledge, and capital. It is also important to state that the concept of land helps in understanding the relationship between the qualities of soil and water for a specific region. The concept of the specificity of a region demands excludability, which is defined as a boundary for access to the land for some users, whereas others can be prohibited from entering a specific range or utilizing more than the agreed amount of benefits. If land is abundant and unlimited, then no one is concerned about his rights; however, in reality, land is a scarce and precious resource, and everyone is interested in their share. Subtractability deals with the appropriator's use and diminishes the share of the land left for the other users. The degree of this characteristic is also dependent on the type of goods such as the degree of excludability; for example, for private goods, the degree of excludability and subtractability is high (Ostrom 1994: 7; Hagedorn 2002: 4). These characteristics of land develop the idea of ownership related to land property rights. Land is a valuable commodity, and property rights have to be assigned (Libecap 1989: 12). Improper property rights may cause degradation of land.

2.3 Land Degradation: Meaning and Understanding

About one sixth of the World's agricultural land has been affected to varying degrees by land degradation (Al Dousari 2000: 1). This is threatening 900 million farmers depending on arable farmland in around 100 countries because of the reduced productivity of the land (United Nation 1994: 1). Land degradation is defined as the utility cut-off pursuant to abatement under the physical, social, cultural, or economic conditions and in the natural ecosystem (Griffith and Richards 1989: 242).

The term ‘degradation’ originates from Latin, having the meaning ‘reduction to the lower rank’ (Blaikie and Brookfield 1987: 2). The concept of land degradation was used broadly in 1994, after the addition of this term to the US Library of Congress. Land degradation generally refers to the temporary or permanent diminution in the productive potential of the land (UN/FAO 1993b). This decline might be in terms of its major uses or in terms of its economic value. The term land degradation encompasses various indicators and gives a broad aspect to understanding the changes related to the land. This might be a change in soil quality, water amount, wind speed, or vegetation type (Stocking and Murnaghan 2000: 7). For instance, if we assume that the level of ground water has dropped and the land surface is becoming dry, then this is an example of land degradation. Similarly, deterioration in the soil also reduces the productivity of the land (UN/FAO 1993b). Such a reduction in the quality of land is referred to as degradation.

Both soil degradation and land degradation are commonly used terms. Soil degradation is a process that lowers the current and/or potential capability of soil to produce goods or services (FAO-UNEP-UNESCO 1979) or is a loss or a reduction of soil functions or soil uses (Blum 1997: 2). Land degradation encompasses soil degradation and the deterioration of natural landscapes and vegetation. The term land degradation thus covers a wide concept degradation and also includes soil deterioration.

There is a general consensus regarding two critical aspects of land degradation: 1) a significant decrease in biological productivity of land occurs in a natural way, mainly through changes in soil structure, soil fertility, or water level; 2) a decreased efficiency of land occurs as a result of anthropogenic activities (Johnson and Lewis 2007: 2).

2.3.1 Land Degradation as a Natural Hazard

This type of land degradation occurs because of topographic (changes that occur in the Earth structure) or climatic factors.

Land degradation through soil: Much arable land has lost its productive capacity because of soil degradation, which has two components; 1) soil erosion, which is the physical wearing away of the fertile soil surface attribuTable to the combined affect of wind and water and 2) a decline of soil fertility. Other major soil degradation factors include the improper use of marginal quality (saline/brackish) water for irrigation purposes leading the productive soils to become marginal (saline and saline-sodic). Soil degradation is a process that is related to

biophysical activities and is aggravated by socioeconomic and political factors for different reasons (Lal 2001). Once the soil is degraded, it requires high inputs for crop production and hence leads to a high cost/benefit ratio.

Soil erosion by water: The disruption of the soil surface through rain drop splash impact and the subsequent removal of the soil by flowing water is an example of rain-induced water erosion. In arid and semi-arid regions, rain plays an important role in agriculture; however, its intensity and distribution throughout the year is important in crop production. World Meteorlogical Organization explains that high intensity rainfall creates problems for cultivation and causes severe floods that wash away good fertile soils; therefore, rainfall and its intensity plays a vital role (WMO 2005: 12). Water erosion is common in some countries, e.g., in Nepal, heavy rains have adverse effect on rain-fed slopes (Acharya, Tripathi and Donald 2002). Water erosion is of three types: sheet, rill, and gully erosion. Sheet erosion is common in flat plains, whereas rill and gullies are common in sloping landscapes.

Soil erosion through wind: Wind erosion is common in sandy desert areas, such as when landscapes are composed of sand sheets and sand dunes. Abdelfattah (2009: 1) has described the situation in desert-containing part of the Arab Emirates, and in Dubai, this type of soil erosion is the main reason for land degradation.

Soil Fertility: Because of intensive agricultural activities and poor replenishment of plant nutrients, soils sometimes become infertile and decline in their production capacity. The loss of productive surface soil through erosion also reduces the biological activities of soil, and the loss of organic matter ultimately affects soil fertility. Soil slope, texture, and surface and subsurface features play important roles in soil reclamation and the rehabilitation of degraded lands. Some aspects of land degradation are easily reversible, and some are difficult to return back to their original capacity. For example, the removal of the total top soil cover through wind or water erosion is irreversible, whereas a shortage of some nutrients can be recovered (Coxhead and Oygard 2007: 2).

Waterlogging: When the ground water Table becomes so high that excess water stagnates on the surface of land or in the roots of the plants, this is known as waterlogging. This occurs in those areas where water cannot penetrate deeply because of an excess amount of subsurface water or the presence of some hard subsurface layer (clay pan, hardpan) that restricts downward water movement. Waterlogging is evident in low lying areas where hydrological flow causes water logging in depressions and ponds are created, or in those areas that are

prone to intermittent floods. Waterlogged conditions are not conducive for agricultural activities and are deadly for plants. According to the strategic plan 2007-16 of Forum of Agriculture Research in Africa (FARA) most of the large scale irrigation systems established to enhance the productivity of the agriculture sector have failed to give the required results; they are even contributing some serious natural hazards such as waterlogging and are the cause of the damage of agricultural land.

Salinity: This is a measure of the concentration of all the soluble salts in soil or water. Arid and semi-arid zones receive inadequate and irregular precipitation to accomplish the leaching of salts originally present in the soil profile. Normally, when the precipitation is more than 1000 mm per annum, salinity should not develop. This is not the case in arid zones; therefore, salts accumulate in soils. Salts building up in concentrations detrimental to plant growth is a constant threat in irrigated crop production. In arid and semi-arid regions, evapotranspiration is higher than the total annual rainfall. Therefore, rainfall contributes insignificantly to groundwater recharge, and hence, there is general shortage of fresh quality water to offset the total agriculture water demand in these countries. The shortage of fresh water necessitates the use of marginal quality ground water, such as brackish and saline water, for irrigation purposes. This is highly demanded in water-scarce regions. The improper use of saline/brackish water in irrigated agriculture often introduces salinity and sodicity problems, and the soil, if not properly managed, can reach a condition in which it cannot be exploited to its full production capacity. Under such conditions, irrigated agriculture has faced the challenge of sustaining its productivity for centuries; in particular, soil and water salinity, poor irrigation, and drainage management continue to plague agriculture, especially in arid and semi-arid regions (Tanji1996). If soil becomes saline and sodic, its quality becomes poor creating plant- and soil-related problems, with many plants either failing to grow in saline soils or their growth being retarded significantly; therefore, soil salinity often restricts options for cropping in a given area. Australia suffers from this kind of degradation as sixty eight percent of its total land is affected by this white plague (WMO 2005: 8).

Sodicity: This is a measure of sodium ions in soil or water relative to calcium and magnesium ions (Richards 1954). It is expressed either as the Sodium Absorption Ratio (SAR) or as the Exchangeable Sodium Percentage (ESP). If SAR of the soil is equal to or greater than thirteen or ESP is equal to or greater than fifteen, the soil is termed sodic (Richards 1954: 4). Accumulation of excess Sodium on the soil exchange complex causes adverse effects on soil

structure and enhances concentration of Hydrogen ion in soil (pH) and soil erosion. High ESP also affects plant growth because of imbalances in plant nutrition, causing Na-induced nutrient deficiencies of several nutrients (Qadir and Schubert 2002: 276). Soil sodicity is a major constraint to Pakistani agriculture where sixty per cent of the salt-affected soils are affected by various levels of soil sodicity. The reclamation of sodic soils is a laborious, time consuming, and costly task. In Pakistan, the reclamation of sodic soils is usually performed with gypsum as a supplement. The gypsum on dissolution introduces calcium, which replaces Sodium from the soil exchange complex and reduces ESP levels. India has severe problem of soil sodicity. Morocco, in the southern Mediterranean region, has limited growth of vegetation and crop yield attribuTable to this natural problem in its agricultural land, mainly because of the over-utilization of ground water and land for more agricultural output (Bannari et al. 2008).

Soil Burial: In some countries in which floods are common, fertile soils are covered by new sediment brought by the floods; however, in many cases, these sediments bring good quality material, such as clay and silt, which improve soil structure and nutrient holding capacity. In sandy desert conditions, wind also plays a role in the burial of soil, and sand can deluge grazing land (UN/FAO 1994).

Impact of climate change (CC) on land degradation and agriculture: Climate change will affect rainfall amounts, frequency, patterns, and duration (rainfall becomes less reliable) leading to increased floods, hurricanes, storms, and drought (leading to water and food shortages). The green-house effect (GHE) will increase evapotranspiration, and thus crop water demand will definitely increase, leading ultimately to changes in cropping patterns and declines in yields. Immediate impacts will be on dryland farming in Africa, specifically in Ethiopia where less than one per cent of the total cultivated lands are irrigated, and the rest is rain-fed; therefore, the dry areas are likely to become even drier and will be too hot for certain crops. By 2020, yields from rain-fed agriculture in some African countries are projected to decline up to fifty percent, thereby increasing food insecurity and hunger. Seventy five to two hundred and fifty million people are predicted to be exposed to water stress attribuTable to climate change. In sub-Sahara Africa, the combination of historical crop production and weather data into a panel analysis has predicted a decline in the yield of maize, sorghum, millet, groundnut, and cassava by 22, 17, 17, 18, and 8 percent, respectively, by 2050 (Burke

et al. 2009: 4).

2.3.2 Land Degradation as Anthropogenic Factor

To a large extent, land degradation is a natural process; however, it is also enhanced by human involvement. Increased human activities lead to drastic changes in the land response and cause an irreversible decline of its natural safeguard function (FAO/World Bank, 2004). For instance, to achieve greater output from the land, over-cropping is a common problem all over the World and causes deficiency in the micronutrients of the soil (World Bank/GFE Support Effort 2008, Environment Assessments of Nepal 2005).

In the recent past, land use had been considered a local environmental issue, but now it is recognized as a global problem (Foley et al. 2005). Land-use change at the World level, from forest to farm land and from farm land to housing in recent decades, has been observed to provide food, fiber, and shelter to more than six billion people. Because of this change, natural resources such as land have lost their productivity. The main causes of land degradation via anthropogenic influences are of two types, a) disturbance in cultivation and pastoral activities and b) effect on natural ecosystem (Sherbinin 2002).

Over-cultivation of land: The use of lands in excess of their capacities leads to a decline in soil quality through the loss of most of its minerals nutrients. This is common in areas where human demands for food have increased because of uncontrolled population growth (Saleh 2007: 4). A continuous decrease in the amount of arable land per person of the world population means more output is needed from the same quantity of land. This is required to fulfill the demand for food and industrial raw material for the population (World Development Indicator), which is growing day by day and will indeed double in about fifty years (Blaikie and Brookfield 1991: 28).

Monocropping: The repeated monoculture, for example, of rice-wheat together with intensive agriculture has created a number of ecological and hydrological problems. The cropping pattern demands sustainability, as the soil is consistently becoming deficient of all the micro- and macronutrients. This calls for pragmatic soil-use planning in terms of crop diversification by identifying the soil pockets suitable for particular crops coupled with favorable policy measures, making alternative crops more remunerative through building

strong research bases and various economic incentives in terms of, for example, technical support, efficient marketing, and assured prices.

Overgrazing: Overgrazing reduces native vegetation cover, and also soil becomes loose because of animal movement. Thus, soils become prone to wind erosion, whereby the top surface layer is lost through the combined affect of wind and water erosion. This type of degradation is also known as loss of vegetation and is observed when there is pressure to feed more animals on the same rangeland (FAO 1993b). Hardin (1968) explains this problem of vegetation in case of open excess and excludability**.** He has found that if users increase their number of cattle on specific rangeland and do not care for its production, then the land suffers with a loss of vegetation. In Bhutan state, the ministry of the environment reported, in 2001, the presence of about 0.3 million cattle and described it as a huge load on limited rangeland. Similarly, World Wildlife Foundation has been reported in 2007 that in Australia, thirteen percent of its vegetation has been removed because of clearing activity for agriculture (WWF 2007: 2).

Deforestation: Forests are the habitats of seventy percent of animal and plant species on the Earth. Deforestation represents the loss of their environment and the natural source of air filtration that can control air pollution (National geographic). The conversion of forests into farmland is a phenomenon in which most small farmers are settled near the roads and clear some part of the forest for agricultural production. After some time, when that plot of land has become unproductive, they move to another. In the New World, new pressures, the heavy burden of cattle rearing, urbanization, mining, and industrial development, and the need for firewood are increasing forest degradation (Lang 2009: 2). In Australia, the clearing of forests to use land for agriculture causes severe soil salinization attribuTable to imbalance in water cycles.

Desertification: The degradation of land in arid, semi-arid, and dry areas is caused by climatic variations (insufficient water amount) and human activities, i.e., improper practices of plowing, deforestation, overgrazing, and loss of fertility. United Nations Convention to Combat Desertification (UNCCD) negates the impression that this occurs in dryland areas with water scarcity, low rain fall, and maximum evaporation leading to the expansion of existing deserts is wrong (Zelaya 2008: 2). Together with other causes of degradation pursuant to human activities such as the cultivation of inappropriate areas, overgrazing, deforestation, and inadequate irrigation practices, the intensification of these activities reduces

the chances of the resilience in land ecosystems (Enne & Zucca 2000). Shahid (2004: 15) has characterized desertification as the reverse of soil development or formation.

City Expansion: In the case of city expansion, most of the green areas around the cities and pri-urban farmland are affected by degradation. Although, this kind of biomass loss is for the settlement of the population, but through this process, agricultural land is reduced, and the pressure on the remaining land is increased to achieve greater production from less land; the intensive use of fertilizers and other chemicals by farmers causes soil contamination and subsurface water contamination. This type of degradation also affects the quantity of the food supply because potentially highly yielding land has been used for non-agricultural (urban/industrial) purposes (Roca 1993: 3); this is an enormous threat for prime agricultural land (Romeo and Ordenes 2004: 197).

Institutions and land degradation: Apart from using the typical approach of blaming natural factors or the lack of cooperation between different land-use stakeholders, land can also be degraded because of inappropriate land institutions, e.g., the land tenure system, poorly defined property rights, or the unequal distribution of land together with insufficient state bureaucracies dealing with the strategies of land and soil conservation (Biot et al. 1995: 30).

Meyer and Turner (1994: 6) have examined several major issues of inquiry in land transformation. They focus on human driving forces such as population, income change, technological change, and institutional, political and cultural change. Unsustainable governance structures are the reason for weak tenure rights and security for smallholder farmers, pastoralists, forest-dependent people, and indigenous people.

2.4 Land Degradation at World Level

Over many years human beings have used land to gain diverse benefits, and many of the methods used to gain those benefits are now being seen as unsustainable, because in many cases they lead to degraded land. About seven billion hectares of the World's land are considered as arable in comparison with a total area of 13.2 billion hectares, with only 1.5 billion hectares being cultivated at present (Massoud 1981: 3). According to the Report of Global Environment Outlook 3, published in 2003, approximately two hundred million hectares of the World, which is equal to more than the United States and Mexico, has been lost to exploitation for agriculture and environmental services because of land degradation. About thirty four million hectares, which is twenty three percent of the total cultivated area,

are saline and fifty six million hectares, about thirty seven percent, are sodic (Massoud 1981: 3).

Table 2.1 Land degradation at World Level

As a Natural Hazard		Through Anthropogenic Factors	
Type of land degradation	**Affected land**	**Type of land degradation**	**Affected land**
Water erosion	56%	Overgrazing	35%
Wind erosion	28%	Deforestation	30%
Fertility loss	4%	Agricultural activates	27%
Chemical	12%	Over exploitation of vegetation	7%
		Industrialization	1%

Source: German Advisory Council for Global Change (GACGC) 1994

Table 2.1 presents the World status of land degradation and clearly illustrates that most of the land is degraded by water and wind erosion, and human involvement through overgrazing, deforestation, and agricultural activities are the common reasons for such erosion. In general, erosion rates are high in recent years because of the cultivation practices as farmers cultivate many more cash crops instead of pasture crops. The erosion rate in Africa, Europe, and Australia is about five to ten tons per annum on average. Whereas in North, Central, and South America, the rate of erosion is ten to twenty tons annually, in Asia, it is a maximum with thirty tons per year on average (Muir 2010: 4). Rapid increases in population and the burden of this on urban areas are also major causes of land degradation these days (Population Information Report 1997).

In the US, about seventy three percent of pastures are publicly owned, and according to monitoring by the Bureau of Land Management (BLM), at the end of the year 1998, only one third of these pastures were operating satisfactorily, while the remaining two thirds were performing badly (Muir 2010: 2).

In 1996, GACGC introduced a new concept of sixteen syndromes in which natural resources are used insufficiently. Most of these syndromes are related to land degradation. For instance, ‘Sahel Syndrome’ is related to the over-cultivation of marginal land, and ‘Overexploitation Syndrome’ describes the misuse of natural ecosystem. Similarly, if traditional agricultural methods are discarded, then the negative effects on the environment can be studied as ‘Rural Exodus Syndrome’. For urbanization, the damage of land is

categorized as ‘Urban Sprawl Syndrome’. This report has tried to focus on global problems, and Sahel syndrome and urban sprawl syndrome are given top priority for resolving the issue of land degradation. It is now a global consensus that the World is being challenged with the problem of land degradation because of deforestation, desertification, and land degradation attributable to urbanization.

Presently, forests represent more than one forth of the total land area as one half of the forest is already lost (Polar regions are excluded). The impact of humans on forests is excessively negative, which has affected the quantity and quality of the remaining forests (Global Forestation 2006). From 1950 to 1980, after World War II, farmland increased as many forests were destroyed. For the increment in irrigated cropland, forests from areas of the size of approximately three hundred and thirty one million hectares were removed (Richards 1990: 163). The same situation has occurred in the Brazilian Amazon where poor farmers have to settle, as they need crop land for their livelihood. Between 1995 and 1998, the government established about one million fifty thousand households that consumed fifty hectares of land, which is approximately forty eight percent of the forest. They produce banana, palm, and rice for one or two years, and when land loses its productivity, they move to another piece of land after cutting down a new part of forest; this is the main reason for deforestation in this region (Butler 2009: 1).

Desertification covers one third of the World's land area. The most obvious impact of desertification is the degradation of 3.3 billion hectares of the total area of rangeland, constituting seventy three percent of the rangeland with a low potential for human and animal-carrying capacity, and a decline in soil fertility and soil structure on about forty seven percent of the dryland areas constituting marginal rain-fed cropland. These degraded irrigated cropland, amounting to thirty percent of the dry land areas, have a huge agricultural potential along with a high population density. Two hundred and fifty million people are suffering from this kind of degradation of land, with one billion people in over one hundred countries being at stake. All these people belong to the poor nations of the World having a weak political setup (UNCCD 2008: 1). About 3.6 billion of the World's useful dryland for agriculture has suffered from erosion and soil degradation, forcing people to leave their farms for jobs in the cities (UNCCD 2008: 1). Recently, Shahid (2006: 17) has emphasized that desertification affects about one sixth of the wworld’s population and one quarter of the total land area of the World. Most of the affected land is in North America (about seventy four percent of the total

land) and in Africa, where more than 2.4 million acres of land (seventy three percent of its drylands) are at stake (UNCCD 2008: 1).

Figure 2.1: Areas at Risk of Desertification

Source: www.map.com

According to Figure 2.1, regions in Africa are at very high risk, which is attribuTable to overgrazing. Water logging and salinity have also not been tackled tactfully, so that these problems have grown, and the ratio of land degradation has increased in the area. The same situation can be discovered in Australia where people only recently came to settle. Their first remedial measure was in 1930 when they passed their first soil legislation. In Peru, the problem is caused by deforestation. Salinity in the United States and in Mexico is also a great problem for their lands and is reducing their productivity (Dregne 1986: 4).

Urbanization will be a future threat for the World when one million hectares of cropland are converted into roads and highways every year; seventy million people are estimated to need land for their survival including housing and urbanization (Brown 2005: 81). This is not only a threat for crop land but also for forests and other ecosystems, e.g., dryland ecosystem (Dregne 1986: 1). The expansion of cities, mostly covering the countryside or farmland in rural areas, consequently causes a fall in food production, and the remaining land has to bear

the load of supplying more food for the larger population. Currently, the World average of available land per capita is forty four people per km^2 (FAO 1992). United States (US) is also suffering from this problem, e.g., California an important agricultural state in the US, which was initially an exporter of agricultural products, now produces only forty two percent of its fruit consumption and forty three percent of its vegetable consumption (Osborn 1989). Most part of agricultural land in one of its highly productive valleys, Santa Clara Valley, has been converted into a suburb of large cities. This has a bad effect on the agricultural production of California, probably will find it difficult to produce sufficient food for even its own population.

Because of the increase in the World population, various conflicts between land users have arisen because of the pressure on land. These conflicts cause desertification, deforestation, or soil erosion (USAID 2009). To reclaim this degraded land, proper land management is required. Some decisions relating to land ownership, cultural consideration, and political and economic strategies are necessary for land management and might give rise to sustainable agricultural development. Although, in some places, farmers have successfully reclaimed their land, and communities are now stable and have moved away from the bad effects of land degradation (desertification) with sound growth, most of the information related to the linkage between this degradation and their socio economic and human management is missing. Although much other information is available, there is a need to organize this information to bridge the gap between what is known and what is not. This link can be established through institutions (Bunning 2002: 1), which include the land tenure system and particularly ownership rights for the sustainability of land (United Nations Population Information Network 1995: 6). In such countries where rangelands are under severe threats, a national action plan against overgrazing can be formulated and strictly implemented. In addition a land-use plan for the mitigation of identified land degradation impacts and measures for soil maintenance can be put into place.

2.4.1 Causes of Land Degradation in Asia

Figure 2.1 clearly explains the situation of Asia where most of the areas are at high risk of land degradation. This is the largest continent of the World with a huge population load and

has to meet the food demand for its large population. Most of the land in Asia is dryland;[1] however Asia together with the Pacific region has been reported to have half (fifty four percent) of the World's population with only seventeen percent share of the World's land (UN/FAO 1992). Even in this situation, this region of Asia and the Pacific is in a better position than Africa and South and Central America. These regions can fulfill the requirement of the food needed by such a huge population with the production of cereals and other comparative crops. For this purpose, they can use technology and new agricultural practices. The excessive use of fertilizers and pesticides increases the output but has a negative impact in the form of causing land degradation (UN/FAO 1992). Mainly, degradation occurs through natural hazards, but anthropogenic is also widely observed, e.g., salinity, sodicity, and alkalinity (Blaikie and Brookfield 1986: 4). Because of salinity, ninety percent of the farmland in Abu Dhabi (UAE) has lost its productivity (Henzell 2009). Water Tables in most areas are not up to the standard, and soil has lost its fertility. Fifty percent of Central Asian land is salinized because of the poor drainage system attribuTable to a lack of investment and improper maintenance after independence from the Soviet Government (Ji 2008: 10).

Such population pressure also causes other types of land degradation, e.g., overgrazing, over-cropping, and lower soil fertility, as shown in Figure 2.2, together with some social problems such as poverty, poor management of a farm system, and the loss of traditional agricultural framing practices (UNCCD 2003). In addition to the afore-mentioned problems, deforestation for agriculture and city expansion is common because of population pressure, and urban expansion has emerged as a major form of land degradation, since most of the agricultural land is being converted into plots for lodgings or industries (FAO 1992).

In 1980, four million hectares of forests were cleared in Asia for agriculture. Indonesia is an interesting case where deforestation was started in the Seventies, when there was a boom in a timber market at a World level. At that time, Indonesia was the most important exporter of wood logs in the international market, and this contributed a major source of earning to its GDP. Thus, Indonesian forests were degraded at an extremely high rate, which was estimated as 2.4 percent per annum in 1993 (WRM 1994).

[1] According to the United Nations, Dryland are areas with an aridity index value of less than 0.65; they comprise dry sub-humid, semi-arid, arid and hyper-arid areas.

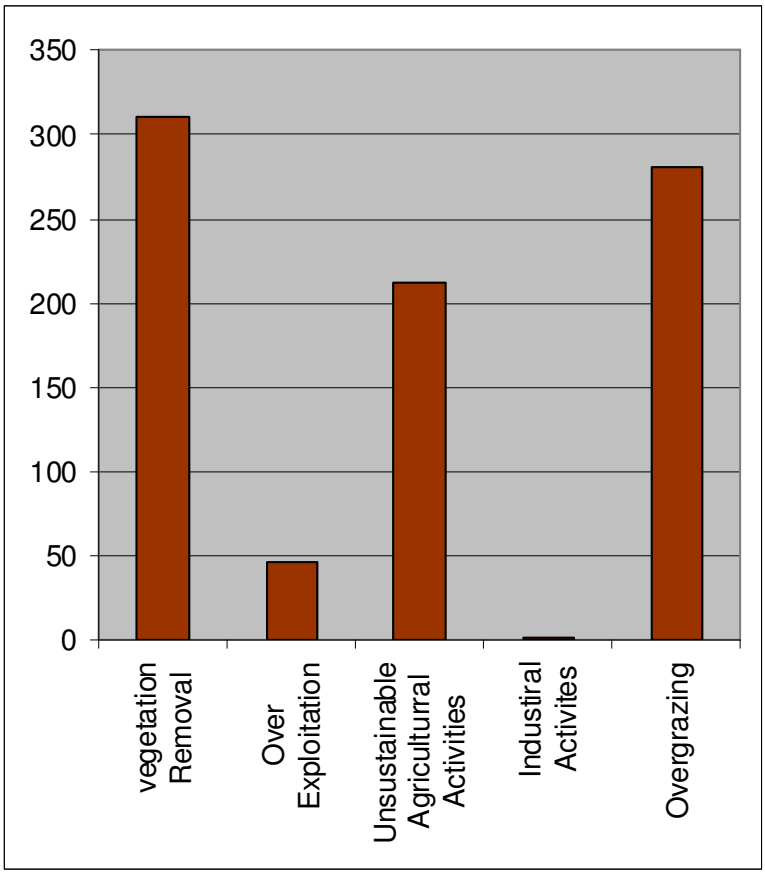

Figure 2.2: Causes of Land Degradation in Asia and Pacific Region
Source: UNEP/ISRIC (1990)

Land in Asia is mostly dryland and is a major cause of desertification. Failure to undertake resource management polices in these semi-arid and arid areas has caused land degradation by overgrazing, overexploitation of land and water resources, cultivation, and population pressure (Hong Ma and Hongbo Ju 2007: 55). As shown in Figure 2.2, desertification in Asia is caused by overgrazing in Middle, East, and Central Asia. This is a great problem in those regions where laws for grassland are not existed. Cattle are privately owned, but grassland is common property, and in these areas, overgrazing is increasing and causing loss of pasture areas. Sixty six percent of Kazakhstan is affected by desertification and drought. Similarly, eighty percent of the land has lost its productivity in Turkmenistan and Uzbekistan. Erosion has an extremely bad effect on eighty eight percent of the arable land of Kyrgyzstan and on ninety seven percent of the agricultural land of Tajikistan (UNESCAP 2007). Water erosion of the cultivated lands is common in China, and salinity and waterlogging can be observed in

Iraq, Pakistan, and Russia (FAO 1992). As shown in Figure 2.1, Asia is at high risk of desertification as a total of 15,670,000 km^2 area is affected and 3,210,000 km^2 is experiencing severe effects. The remaining 7,980,000 km^2 has light desertification (Dregne 1986: 3).

Like the rest of the World, Asia also has a problem of land loss for agricultural production attributable to city expansion. The fast growth in industrial and other sectors is the main cause of increment in the population of large cities, together with the need for more houses and more places to live and work; a rapid expansion of urbanization has thus resulted. According to the definition of Johnson and Lewis (2007), the loss of biomass is considered as land degradation. Land is fixed in supply, and so the ultimate result is the use of agricultural land for urban expansion (Brunn, Williams and Ziegler 1992, Van 2006: 1), e.g., China has reduced approximately 20 percent of its agricultural production since 1978, mostly because of rural industrialization and small-town growth (FAO 2006). Israel, which was basically an agrarian economy and had a large setup of agricultural land, shifted most of the burden of its economy on the industrial sector in 1980, and the agricultural sector became economically unstable, contributing only at the domestic level (Fietelson 2002: 5).

Land degradation is increasing because of poor management policies and the weak institutional setup. Some nations are trying to solve this problem, e.g., in Egypt, the government is attempting to cover the ongoing land degradation process, but instead of cultivating old defective land, they have brought new land under cultivation and have increased productivity. To maintain this level of production, the government has introduced some policies (Nielsen et al. 2005: 159), starting a strategic plan with the collaboration of the United Nations in the coastal areas; through this management plan, they are also trying to reclaim their cultivable land, which is being degraded because of urbanization (Economic and Social Commission for Western Asia (ESCWA) 2007: 18). Similarly, Iraq, which has also been a great victim of land degradation in the Middle East, has followed some new polices by the government and has solved most of this problem in the marshes. Now there is possibility of vegetation growing in marshes after flooding them. Both the government and the local people are trying hard to recover the old habitation in their native environment (ibid). Clearly, in the Middle East (Asia), the observed beneficial trend in vegetation has occurred because of government policies and local scale practices, indicating the vital role played by the institutions in removing land degradation (Nielsen et al. 2005: 159). In Turkey, improper land distribution is a major cause of land degradation. In some places, the farm size is too large and

is difficult to handle; in some places, however, the land parcels are small as a consequence of the sharing of inheritance. Such small pieces of land have contours that make plowing difficult. The introduction of land property rights for farmers has been extremely helpful in resolving this issue (Günay 2001: 3-4).

2.4.2 Causes of Land Degradation in South Asia

South Asia is a region containing eight countries: Afghanistan, Bhutan, Bangladesh, India, Iran, Nepal, Sri Lanka, and Pakistan (UN). Most of the economies of this region rely on agriculture as sixty one percent of the population earns from this sector. Total crop land is about thirty five percent of the region; pasture and forest both consist of fifteen percent (UN/FAO 1991). In comparison to land resources, these countries have high population densities. This is the main cause of the over-cultivation of land to fulfill the local needs; the usage of fertilizers in 2000 was much higher than in previous years (FAO 2003: 6).

Other main reasons of land degradation are the types of land, soil, vegetation, and irrigation systems (UN/FAO 2004: 4). This region is mainly affected by six different types of land degradation, viz., water erosion, wind erosion, soil fertility, waterlogging, salinity, and a high water Table. Some other types of degradation are also observed, such as overgrazing of rangeland, deforestation, and desertification (UN/FAO 2004: 5). Soil fertility decreased in India, Bangladesh, and other countries when they under-used fertilizers. Wind and water erosion is also common in these countries.

The area affected by water erosion is approximately thirty percent in both India and Sri Lanka, whereas Bhutan has a minimum of fourteen percent (Lynden and Oldeman 1997: 18). If we compare these figures with the figures of a study of UN/ FAO (1992: 6), then in India, it was eighteen percent; in Sri Lanka, it was forty six percent; and in Bhutan, it was ten percent. This is an alarming situation for India. Another type of degradation is wind erosion, in which nearly ten percent of the area of Pakistan was affected in 1997 (Lynden and Oldeman 1997: 20).

Deforestation in this region is caused by an anthropogenic process, as the use of wood for domestic purposes and even for commercial use and the over-utilization of vegetation is the reason for the unsustainable growth of forests. Population pressure also places a strong burden through the water erosion, wind erosion, and the decrease in the soil fertility on the land; most parts of the region have become less productive.

Poverty is another the main causes of land degradation in these countries (Perera and Fernando 2004: 13). The income of half a billion people in this region is less than one dollar per day. Most of the population rely on agriculture, and in the absence of any other income generation source, they are totally dependent on their small land holdings. Poverty does not allow them to manage their resources in a sustainable way. The clearing of forests, overgrazing, and the imbalanced use of fertilizer are also related to this lack of management caused by poverty (ibid).

Agricultural land loss for the settlement of population and the development of cities is also a common problem in this area. Human settlement doe not occur in a uniform pattern (Perera and Fernando 2004: 6). Dhaka city is a common example of this aspect in the region where, because of city expansion, many fruit orchards were destroyed. Khulna is another case, which was an important center for agricultural production with excellent dryland (Bangladesh: State of the Environment 2001).

The issue of land degradation can actually be solved by policies and planning. Nepal has lost twenty seven percent of its forests for firewood and energy resources. People also cut down the forest for agricultural farmland and pasture where overgrazing causes damage. However, this problem of deforestation in Nepal was solved 30 years ago (Gautam 2004: 1) by evolving forest policies and forestry institutions, and because of the proper implementation of these policies. Until 1957, the Nepalese government was also in favor of clearing forests and cutting down trees for farmland and the extraction of timber for export. In 1957, the forestry industry was nationalized, and policy makers tried to stop forest degradation. In the early years, they were not successful in their efforts, but in the late 1970s, when they involved local people in decision making and arranged community-based management, then the program was met with remarkable success (ibid).

Similarly, in 1998, the World Bank started a project in Utter Pradesh (India) for the reclamation of the land that had been degraded because of sodic soil. This project was mainly for the support of rural soil renovation and the development of infrastructure and institutions for soil reclamation. The most important step that they have taken for this project is the involvement of the poor community of the various regions of Utter Pradesh. These self-organized farmers were responsible for the management of the land and water arrangements for the land. They were also taught how to arrange their household income and so they organized their own mini banks, which entitled them to obtain loans from commercial banks.

This project was for the duration of 10 years, and at the end of the period, the overall outcomes of the project were satisfactory. The World Bank concluded that inclusive community institutions are helpful for land reclamation, and that community mobilization is necessary for the effective results of these institutions (World Bank 2008). Scherr and Yadav (1997: 4) have also recommended a secure property rights system for the long-term improvement and investment in the agricultural sector of developing countries.

2.5 Land Degradation in Pakistan

In 1984 Boffey wrote in his article of 1st January published in 'New York Times' that the Pakistani people would improve their diet in next 20 years. However, 15 years after his prediction, most of the nations mentioned in that article, including Pakistan, faced a food crisis. The years from 1988 to 1992 are viewed as massive flood years in Pakistan's history, the floods destroying most of its agricultural land. In 1996, Pakistan was declared among the critical zone, with degraded land amounting to thirty eight percent of the World's arable land (World Watch Institute Report 1996).

According to a report of FAO (1994: 10), land degradation in Pakistan is caused by three different agents:

Natural disasters and climate change: Geographically, Pakistan and other South Asian counties are host to many natural disasters (World Bank Strategy of Region). Pakistan has faced many natural adversities in the past 25 years, e.g., flood, drought, Earth quakes, and wind storms, which might be of the simple storm type or sometimes cyclones. Insect infection and land slides have also been observed in various areas of these countries (Pakistan Space and Upper Atmospheric Research Council (SUPARCO) 2006). All these natural disasters have dire effects on land and inflict degradation of diverse intensity. As shown in Figure 2.3, flooding is the most common adversity that has affected land extremely badly in the last 25 years (Annual Flood Report 2006). In 2010, Pakistan has faced one of the worst floods in the history. Loss during this flood has exceeded more than the total of 2004 Indian Ocean "Tsunami", 2005 Pakistan earthquake and 2010 Haiti earthquake (UN 2010).

According to the data reported in this report (Table 2.2), 1976, and 1992 were massive flood years that created a great loss in agricultural land in most of the villages all over the country. Twenty percent of rural land and fifteen percent of agricultural land were severely impacted by flooding. Similarly, fifty percent of the flood plains in rural areas and thirty five

percent in urban areas were damaged moderately, whereas fifty percent of the land in rural and urban areas was affected slightly. Only thirty percent land was not affected during these floods (Khwaja 2006: 242). But 2010 produced worst flooding in 80 years, estimating the death toll ranged from 1300 to 1600. This recent flood has affected one fifth of the country and has destroyed about 2.6 million Acres of cultivated land along with the approximately 2.5 billion of US dollars of crop loss (Xinhua 2010: 1).

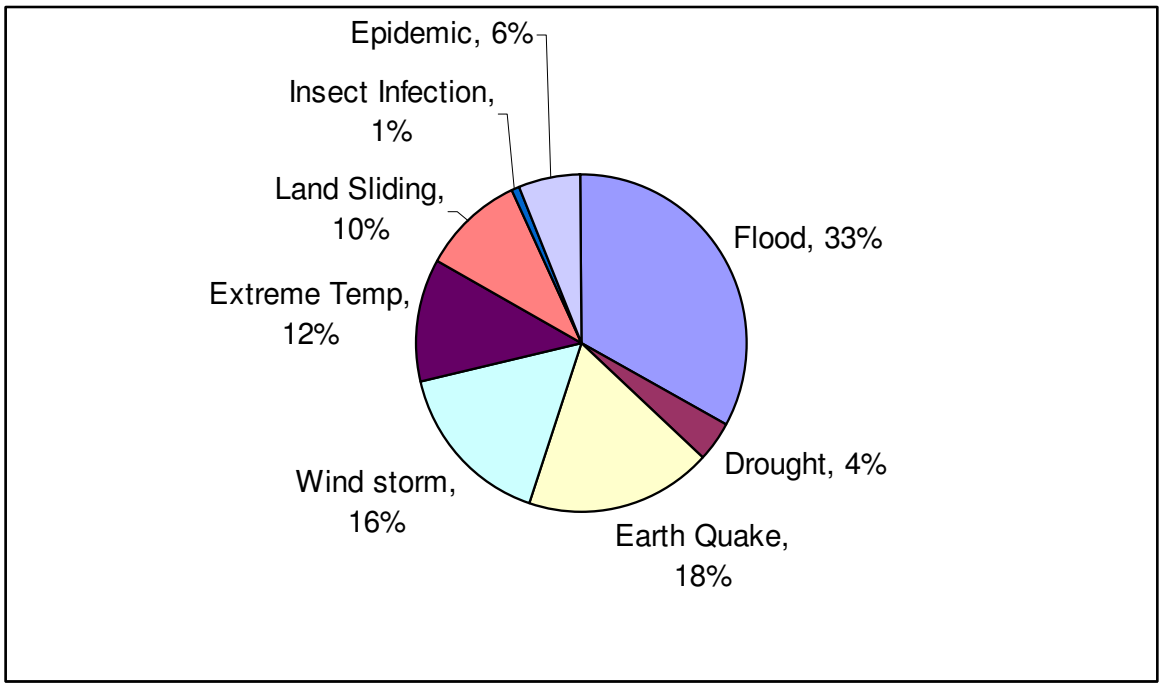

Figure 2.3: Frequency of Natural Disasters in Pakistan during 1954 and 2004

Source: Pakistan Space and Upper Atmospheric Research Council (SUPARCO)

Drought is also well known in Pakistan, being related to the duration of reduced water supplies for crop growth. It can last for some months or expand over years; because of only brief rainfall during the monsoon season[2] and reduced snowfall on the mountains in winter, the water supply for land becomes insufficient. Pakistan experienced two droughts in 1999-2000 and 2000-2001 (Haider 2006: 16).

During these droughts, Baluchistan was worst affected at ninety two percent, Sindh experienced drought at sixty five percent, Khyber Pakhtunkhwa, previously known as North-West Frontier Province (NWFP), was ranked third at forty two percent, and Punjab had the

[2] Rainy season starts from July and ends in September normally.

minimum of twenty one percent loss (ibid: 18). There was a loss of three million lives and 7.2 million livestock with hundreds of people and animals going missing. One of the most important drawbacks of this drought was the migration of local populations; they left their home land in search of food and jobs after losing their livelihoods on agricultural farms. They moved to the cities, which disturbed the traditional agricultural system and land-use pattern and caused permanent loss, even after the drought period was over. This caused land degradation as desertification in most of Pakistan (National Conservation Strategy Resource Center (NCSRC) 2007).

Table 2.2: History of Floods in Pakistan

Year	Affected Villages
1976	18,390
1978	9,199
1988	1,000
1992	13,208
1995	6,852
2001	50
2003	4,376
2004	47

Source: Annual Flood Report 2006

Direct causes: By using an untenable and inappropriate method of land cultivation, problems of land degradation have increased.

- **Overgrazing:** Livestock is one of the important industries of Pakistan, and according to the Economic Survey of Pakistan 2008-09 the livestock economy covers 11.3 percent of GDP from this sector. The number of livestock is increasing with the growth of this sector and has doubled since 1976. Pakistan has classified its one third of the agricultural land area as rangeland, but with the growth of the sector, this is not enough for the growing number of animals. Overgrazing is the most common problem in most of the rangeland of Pakistan, and the overall productivity of these areas is reduced, as some areas have lost their productivity completely, and some have only twenty to thirty percent of their

production capacity (NCSRC 2007) because of soil erosion through wind and water and the removal of vegetation.

- **Extraction of water:** Underground water is removed for various uses by humans. This excess removal causes shortages in the underground water availability for agricultural purposes and leads to the salinity. Pakistan has one of the World's largest gravity irrigation systems based on the principles of flooding. Management at both ends, viz., at the farm level and at the irrigation management level, is extremely poor. This causes dire effects on agricultural output in the form of agricultural decreases caused by salinity, sodicity, and waterlogging.

  Human intervention such as the erection of barriers in natural drainage systems through construction, improper alignments, and poor maintenance of the irrigation channels are the main cause of land degradation. About eleven million hectares of arable land in Pakistan are affected by waterlogging, and three million hectares are affected by salinity and sodicity (NCSRC 2007). In Pakistan, twenty six percent of the irrigated land are affected by soil salinity (Ghassemi et al. 1995, Faisal and Ismail 2010).

- **Use of pesticides and fertilizers:** Pakistan is a populous country and needs to grow more crops to meet the demand of food for the growing population. The country heavily depends on its agricultural sector, and the contribution of this sector to GDP is approximately twenty two percent. Pakistan needs to produce a greater output of cereals, especially wheat, to fulfill the need for food by its fast-growing population (NCSRC 2007). To achieve increased output from their farms, most farmers use pesticides and fertilizers, but this creates benefits only for a short period of time and a subsequent loss in the form of land degradation (FAO 2004, NCSRC 2007). This degradation causes water pollution and loss of important nutrients. It may also cause the loss of the local and traditional agricultural systems, together with the reduction of some highly valued crop yields (NCSRC 2007), e.g. production of Basmati Rice has reduced because of land degradation.

- **Deforestation:** Pakistan is losing its forest cover, at the rate of five percent per annum, for the household consumption of fuel wood for cooking and heating. A total 5.2 percent of its area is covered with forest, and about 3.1 percent is the calculated loss for the biomass per year, which is about 3 times more than that in other southern Asian counties. Because of this excessive rate of deforestation, soil erosion is much more intense in these areas, and

the land is less able to absorb rainfall, which thus removes the upper soil cover and causes desertification (NCSRC 2007).

Economic and social conditions:

- **Population Pressure:** Pakistan is number six in top ten most populous countries with a population of 176,242,949 (World Fact Book 2009). The total land mass of the country is 796095 km^2. The population of Pakistan is growing rapidly, and 153 million people live in close association with agriculture. Increases in the population reveal that this number will increase up to 217 million at the end of 2020 and double within the next 32 years. Such a huge increment in population decreases the per capita share of land and share in water (NCSRC 2007).
- **Poverty:** Presently available information indicates that most of the existing agricultural land in developing nations is lost for agriculture because of land degradation and abandonment, despite the land being potentially productive and reclaimable (Barbier 1997: 891). The main reason for its non-productivity has little interest for the rural population or they are unable to invest long-term in the land because they have limited access to capital and income opportunities (ibid).

  In Pakistan most of the people are poor and depend on land for their survival. According to the UN interagency assessment, the rural population of Pakistan is currently worse off than it was in 1990. Food expenditure of rural people has increased by ten percent and overall expenditure are by four percent, whereas more than forty two percent of households have reported that they have received no increment in their income for the last two years. Forty five percent of the population reports that their real income has fallen, and this causes more insecurity with regard to food (Economic Survey of Pakistan 2008-09). In this hand to mouth situation, they survive on small land holdings and have no other source of income, meaning that they cannot manage their lands in a better way.
- **Institutional setup:** Although the low income level of a nation is a key feature in the misuse of natural resources, once the population becomes socially vulnerable, then a more complex situation arises (Asian Development Bank 2002: 15). “Vulnerability, in a broad and more encompassing sense, arises also from a social powerlessness, political disfranchisement and ill-functioning and discretionary institution, and it is important to

understand these factors as being among the primary causes of persistence of vulnerability faced by the poor" (Asian Development Bank 2002: 15).

One major reason of social vulnerability is the failure of state institutions to provide law and order for the protection of resources to the people (Asian development Bank 2002: 15). In Pakistan, most of the people have problems with existing institutions as they are not particularly supportive of them (Khan 2006: 3). Niazi (2003: 288) has discussed the institutional setup for land distribution in Pakistan and described improper land distribution as being the main cause of land degradation. In his study, Niazi has tried to demonstrate that large land holders affect the productivity of the agriculture sector by mismanagement and ignorant behavior toward the best land.

- Non-agricultural land-use change: Land degradation is a sever problem in South Asia, where problems vary according to land-use practices (Asia-Pacific Forum for Environment and Development (APFED) 2003). In case of Pakistan, industrial development in the district of Faisalabad has caused the degradation in agricultural land for the cotton crop in the surrounding areas. Chemical used in the textile industry has caused water pollution (Surface Water Industrial and Municipal Pollution in Punjab (SWIMPP) 2008). Similarly, in another district near Lahore, named as Kasoor, the chemicals used in leather manufacture contaminate the water and negatively affects the quality of life and agriculture in the area. According to a report on the industrial and municipal pollution of the surface water in Punjab, the major industries are the main polluters of the irrigation and drainage systems. Industrial effluents vary widely in composition and often contain toxic materials, thus posing serious problems for human health and for plant, animal, and aquatic life.
- Increasing population in the country is creating many problems for humanity. The growth rate of the population is 1.87 percent per annum (Economic Survey of Pakistan 2008-09), which is among the highest in the region, posing a great challenge for planners. According to SWIMPP (2008), pollution from the municipalities is much higher than that from industry. The waste from households contains some trace plant nutrients, for instance, toxic metals such as Ni, Cu, Zn, and Fe, which are the main cause of the contamination of agricultural land. This pollution problem started with rapid human and economic development, with an unsustainable use of resources. Development in the form of housing and increased access to the surrounding land causes degradation via soil erosion due to deposition of household waste.

2.6 Summary and Conclusions

From scientific antecedents, the expansion of cropland, pastures, plantations, and urban areas in recent decades is obviously accompanied by a large increase in water and fertilizer consumption. The unsustainable use of resources has caused considerable losses of land productivity in terms of both natural hazards and anthropogenic factors. With the ever increasing trend of population growth, the pressure on land uses has also increased. Such competition for land uses by the various stakeholders ultimately affects land quality to a level at which land is considered as being degraded, mainly because of soil erosion, water logging, and salinity.

Weak institutions also cause land degradation; this is a new view, and limited work has been done in this regard. Institutions play a vital role in combating land degradation. Many nations have designed relevant policies and found highly remarkable results. Most of this work involves government policies for the market system and reclamation of damaged resources. Rules and property rights are defined to improve land conditions. Sometimes, the misuse of property rights enhances the problem of land degradation.

A search of the available literature makes it obvious that no one has explored conflicts related to intergenerational land distribution in Pakistan, a possible reason for land degradation. The present study thus represents a way forward to analyze the relationship between the impacts of land property rights on the land degradation within a particular area in Pakistan. This investigation focuses on finding the causes of land degradation and tries to link these causes to land distribution rights among heirs in the case study regions. The findings should be helpful in bridging the gap between farm-land use and the behavior of the actors causing conflicts, which are considered the reasons of land degradation.

The people of Pakistan are clearly not aware of their rights because of illiteracy, whereas poverty is another hurdle in the way of proper institutional implication. A review of the policies and institutions related to land distribution and land use will be helpful in the management of degraded land and for the relationship of land distribution and land degradation at the family level or the land-use conflicts related to land distribution and land degradation. A revaluation of these institutions and property rights will be supportive not only at the micro level, but also at the macro level as an increase occurs in GDP of the nation. An

understanding of the concept of property rights and the rights of the alienation of land is therefore necessary; these will be explained in Chapter 3.

3 Theoretical Background of Institutions for Land Degradation Analysis

3.1 Introduction

Only twenty five percent of the total cultivable land is free from soil problems in Pakistan (Mian and Mirza 1993), and because of growing land degradation, the rice-producing areas show negative efficiency (Ahmed 2010 forthcoming) in past few years. A reduction in the capacity of the land has been caused by many natural and human factors, the failure of institutions or the improper implementation of rights being one of them. Rasul and Thapa (2007: 9) argue that an insecure land tenure system plays a significant role in increasing land degradation, as it increases pressure on the natural resource. Social inequalities due to the skewed structure of land ownership encourage soil erosion (FAO 1992: 21).

To understand the dynamics of the property rights and their effects on land degradation, the property rights of land owners and the social norms and culture in the area need to be clarified. The implementation of these rights is helpful in land use and land-use change, which might cause land degradation. The objective of this chapter is to obtain an understanding of how property rights work in practice and to analyze different conflicts between the actors regarding property rights and the land use causing land degradation. To achieve these objectives, I will provide a comprehensive overview of the property rights theory, the distributional theory of institutional change, and the theory of property rights for conflicts.

The chapter is divided into several subsections including the introduction. In Section 3.2 different terms related to institutions including property rights and conflicts are defined, whereas in Section 3.3, the Institutions of Sustainability (IoS) framework is explained, and a conceptual framework based on this framework is derived in Section 3.4 for investigating conflicts of land use and land degradation caused by inappropriate property rights. Sections 3.5 and 3.6 include theories related to land degradation and land distribution conflicts, with Section 3.7 presenting the summary and conclusions of the chapter.

3.2 Definitions in Institutional Analysis

3.2.1 Institutions

From the early history of mankind, basic issues of the scarcity of goods and their distribution have been extremely important, and regulations are essential for the resolution of these issues (Furubotn and Richter 1998: 60). These regulations are called institutions and have been defined in different ways during the various eras. In traditional theory, researchers explain institutions as "science of choice and the utility maximizing version of economic man" (discussed by Hodgson 2004: 4). Institutions are "prevalent habits of thought with respect to particular relations and particular functions of the individual and of the commodity" (Veblen 1965: 190).

Similarly, in new institutional economics, institutions are built on the concept of human interactions for a specific preference function. Researchers claim to deal with a lower level of transaction costs for the survival of the peculiar institutional forms for different alternatives (Hodgson 2004: 6). The study of human behavior for the selection of the best alternative is generally accepted to need some defined patterns. Investigations of such behavior develop different institutions that are said to be the observations of the individual behavior in a specific direction (Furubotn and Richter 2000: 6) and to structure everyday life to reduce uncertainty (North 1990: 3).

Interactions between different actors are a continuous process (Sjöstrand 1992: 8), and institutions have evolved from the habits of those actors and are described as regulators in the amelioration of society (Tool 1986: 5). Institutions can be said to be a "social construct" dependent on choices of some human actions performed unconsciously (Vatn 1995: 6). These interactions, between different people or groups in the society in formal or informal ways, have also been given the name of a "web of interrelated norms" by Nee and Ingram (1998: 19). Different groups of societies follow these rules of social interactions in a particular environment of institutions to attain the desired goals. According to Knight (1992: 1), institutions are simply an endeavor to live in a society with rules that develop a social interface; all the members of the entire group should know about these rules (ibid: 2). It is important that each member of the entire group should follow these rules without violation for the betterment of the society. Institutions are also known not only to be responsible for

shaping the society, but also to be the key to understanding historical change through time (North 1990: 3).

Institutions are helpful for understanding the history of the era of reforms in any nation by examining the cultural evolution and change in public policies. Institutions may be “formal constraints” in the form of rules that are enforced, e.g., statutes, laws, constitutions, and land property rights, and may be “informal constraints”, such as customs, social norms, codes of conduct, and sanctions (ibid 1990: 4). Pejovich (1997: 23) has explained the same concept of institutions as “the legal administrative and customary arrangements for repeated human interaction. Their major function is to enhance predictability of human behavior." They may be norms that arbitrate individual and group action or some legal settlements among individuals (Bromley 1998).

Anthropologists define institutions as the interpretation of knowledge and power that can also be manipulated to serve a specific purpose or to attain some goals (Mehta et al. 1999) and are entrenched in the particular local history (Granovetter 1985, Mosse 1998). In this study, both economic and anthropological concepts are used. The functional perspective of institutions explains individual behavior in terms of the maximization of the utility gained from the distribution and usage of land. Similarly, a structural concept is helpful for understanding the actors’ attitude in terms of their authority to use and distribute their resources, particularly with respect to land. This study explains human interactions, the structure of the society, and particular the local history of some specific regions in the presence of institutions.

3.2.2 Formal and Informal Institutions

In general, institutions are social practices that are continuously repeated in a regular manner. They link different rules and interactions that occur in the society and that are allowed by norms and valuable in the overall social environment (Jessop and Nielsen 2003: 2). This study emphasizes both formal and informal institutions, as many authors have explained that the reproduction of institutional design is not solely dependent on social norms. Both formal and informal rules are important to make a strong institutional structure. All state and official laws are part of a formal setup and act as an external force. Traditions, culture, and customs are informal and act as a force from inside the system (Pejovich 1997: 23). These formal and informal institutional aspects are categorized at each level of society and can be small scale,

such as family or friends and working groups, or large social setups, such as organizations and the entire economy (Nee and Ingram 1998: 19).

Informal institutions (norms, culture): Institutions that are not officially recognized and are lacking in authorized protection are categorized as informal institutions. North (1990: 36) emphasizes notions of informal constraints as customs or norms and explains them as constraints that reduce the costs of human interaction. These social rules are normally shared but are unwritten, created, conveyed, and implemented without any official order (Helmke and Levitsky 2004: 727), for example, by culture or convention.

Culture is the transfer of knowledge and values from one generation to the next generation and affects human behavior (Boyd and Richerson 1985: 2). The concept of cultural knowledge is also very well explained by Hayke in 1960 in his theory of cultural evolution. According to his concept, culture is the knowledge that a human can obtain from his past experience because of changes in his behavior and environment. Although this knowledge is less confined than scientific knowledge, it contains more information about the social habits, skills, emotions, attitude, and history of institutional adaptation (Mantzavinos 2009: 10). On the basis of such knowledge, people build up an organization composed of their values, whereas societies are associated with these organizations and institutions, which are a reflection of those values (Hofstede 1984: 15). Culture can also be defined as the transfer of thinking from parents to children, teachers to students, and one society member to others (ibid: 20). Conventions are special types of informal rule, which have self-policing characteristics. After the implementation of these rules, it is difficult to change them (Mantzavinos 2009: 13). From the past, we know that every society has particular cultural and conventional changes with the advancement of time.

Apart from culture, informal rules that are neither proclaimed by a court or a legislator, nor dictated by the threat of legal sanctions are called social norms. These are controlled through the mind, and strong emotions can affect them (Elster 1989: 100). Some norms are self-enforced, e.g., without an understanding of the language, it is difficult to spend the whole of one's life in a foreign country. Some norms are based on emotions, although some are accomplished by disapproval and are obeyed out of sense of guilt or shame (Posner 1997: 365-66). Moral rules provide a solution to many problems of society, but they need no enforcement agency. They are difficult to explain as a social phenomenon because they exist in the mind of humans (Mantzavinos 2009: 13). The basic difference between social norms

and moral rules is that social norms are imposed by a group of people, whereas moral rules are derived through either religion or universal ethics and conduct (Baland and Platteau 1996: 122-24). Social norms are also different in different social setups and are established through the interaction and behavior of the people. Sometimes, these informal institutions are stronger than the administrative powers and can influence formal institutions.

Formal institution (rules): Institutions that are acknowledged by the government are called formal rules. They are dependent on informal institutions (Black 1960, cited in Ostrom 2005: 830). These institutions are also of two types: 1) outcome-oriented changes, which are exogenous changes, develop via a long chain of actors from a lengthy process of their evaluation to an imposition, 2) spontaneous changes, which are normally endogenous, spontaneously emerge by repeating interactions between actors (Pejovich 1997: 29-31). New institutional economists suffer from the problem of endogeneity and exogeneity (Nye 2008: 72). Supremacy of one or the other form of institution depends on their ruling elites. Exogenous changes always create opportunities for the rent-seeking coalitions, and endogenous changes provide benefits for some private elites (Pejovich 1997: 31), but it cannot be denied that institutions are necessary for the development of the economy and are shaped by human behavior (Nye 2008: 73).

"Institutions can be defined as a set of working rules that are used to be determined who are eligible to take decisions in the same arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what pay offs will be assigned to individuals dependent on their actions. All rules contain prescriptions that forbid, permit or require some action or outcome" (Ostrom 1990: 51). Working rules are those where individuals make choices about the actions that they will take for their expected action (ibid), for example, rules that are helpful for a landowner who wants to choose to maximize his utility in the case of land use. These social institutions are a set of rules that shape social interactions in particular ways. These rules tell us about the expected attitude of the people in a particular situation and can be recognized by members of the relevant groups in order to produce equilibrium outcomes (Knight 1992: 54)**.** The definitions of institution can be explained as the people's expected attitude in a situation. This can be defined as the action of the actors who are eligible to take decisions within that action situation for an equilibrium outcome. For example, with the help of institutions, landowners can make better decisions about the division of the land among the different

options. Formal laws are also made according to the situation of the society. In Islamic societies, formal rules are based on Shari'a[3], which guides Muslims in all aspects of their life, including family, property, and other financially related matters (Vriens 2009: 1).

Formal and informal institutions are generally accepted to coincide in any society, e.g., the changes occur in both formal and informal institutions. These changes are processed slowly for informal compared with formal institutions (Williamson 2000: 598; North 1990: 95). Informal institutions usually change because of existing changes in formal institutions (Pejovich 1999), or as the status-quo conditions that sustain these changes (Knight 1992). In case of countries with underdeveloped formal institutions, the influence of informal institutions is very strong (Eggertsson 1994: 3). The way that informal institutions operate in a specific domain of human activity systems can be understood by examining the way that established and maintained social norms influence human actions (Beyene 2008: 23). Formal and informal institutions are known to have some common attributes. 1) Both institutions change with time, although the conditions may be different, and factors are not fully defined under which these changes occurred. This can also be understood as a result of the interactions of the different actors and factors (North 1990: 58). 2) Institutions are often invisible and share concepts in the minds of the people; their effect can only be measured through policies (Ostrom 1999: 5).

In the case of Islamic countries such as Pakistan, most of the formal laws are based on Islamic Shari'a Law, which is primarily derived from Quran (The Holy Book of Muslims) and Sunna, the sayings, acts, and teaching of the Prophet Mohammad (Pease Be upon Him). However, with the passage of time and the emergence of new issues, a development of consensus among Muslim community led to an additional source of Shari'a Law (Robinson 2007: 1). The process of such evolution is known as Ijtihad. Currently, inheritance law is purely derived from Shari'a Law, and other laws have developed with some suitable changes necessary for a Muslim society. Together with this formal setup, different regions have their own traditions and culture, and these informal institutions are involved deeply in every matter of the people of that region.

[3] Shari'a is an Arabic word, which means path.

3.2.3 Property Rights

According to Bromley (1991: 94) "A right is the capacity to call upon the collective to stand behind one's claimed to a benefit stream (that is to one's property)". It is essential for every citizen in the society to fulfill his or her responsibilities (Abdin 2008: 1), but a property right cannot be taken as unbiased agreement to manage something. By assuming rights, an individual can expect from the state to defend his interests in a particular outcome (Sjaastad and Bromley 2000: 3), and in order to avoid undesirable outcomes, the state grants some protection mechanisms of particular relevance for the assurance of these rights (Deininger and Feder 2001: 4).

Property means a belonging over which a person can claim the right of ownership (Hann 1998: 4). The author explains people's behavior in different cultural environments with respect to the ownership of land. According to Hann (1998), property relationships explain the social relationships that exist between different people and societies (ibid: 5). Generally, the existence of property is possible when it is effectively rendered through a complete procedure of appropriation (Godelier 1986: 81). All societies' have different property relationships in order to deal with the problems of individuals, and most of these problems are related to the sense of possession. Property rights try to solve these problems through a particular specification of rights.

Property rights can define the relation between individuals established on the basis of insufficient goods and their use. Individuals must take notice of the norms of behavior or the cost of violation when they interact with each other. Property rights are not defined as a tie between the individual and an object but can be explicated as the relationship between individuals for the use of objects, which is also called ownership, e.g., property rights for land use means the access of an individual to land with respect to other society members (Pejovich 1997: 57). The right of ownership has three main components, 1) exclusivity,[4] 2) transferability, [5] 3) constitutional guarantees of ownership[6] (ibid: 58).

[4] Exclusivity of ownership: the owner has the right to decide the use of a resource, assess to resource costs and benefits of a resource. A restricted right involves some limitations imposed by law, e.g., price control or keeping the boundaries of one's house two feet inside the property line (Pejovich 1997: 58).

[5] Transferability of ownership: the owner has the right to transfer his property to others on common terms and conditions. Through this right, the owner can receive the value (whole or as per condition of the agreement) against his asset (ibid: 59).

[6] Protecting the private property by rule passing by majority (ibid: 60)

Property rights are societal tools and are helpful for individuals, maintaining hopes in their dealings with other members of society. With the approval of other members of society, the owner of property rights can take actions of his own volition. He expects that the community will stop others interfering with those actions to which he has a right (Demsetz 1967: 347). In this way, property rights protect one's action regarding one's property. The individual feels secure, if property rights are properly practiced in the society.

Property rights have been considered the most important and effective means to create, keep, and protect scarce resources (Roberts and Milgrom 1992). They are the rights of the individuals to use property, to generate income from these scarce resources (mainly land), to transfer this land between others, and to change its form and substance (De Alessi 1990: 47, Furubotn and Richter 2000). According to a report from FAO (2002: 26) these rights are called the use rights, control rights, and transfer rights. Use rights are mainly those rights through which a person can occupy, use, develop, or sometimes exploit the resources. Because of the control rights, an individual has a power to decide on the usage or alienation of his asset for income generation. Transfer rights are supportive when the right holder wants to sell, mortgage, or lease the land. In the case of private property rights, all these rights are fully defined, earmarked, and implemented.

Property rights are social institutions defined by the sanctions applied to the individuals with respect to a particular resource. These resources may or may not be moveable. Ownership rights mean the control of the land holder over the land in the case of his physical access to the site and his authority for all sorts of decisions of land uses. In the case of private property, different rights are involved, e.g., the right to exclude non-owners from access, the right to appropriate the stream of rents from the use of and investments in the resource, and the right to sell or otherwise transfer the resource to others. Property right institutions range from formal and informal institutions regarding the use of property. These institutions have a strong influence on decision making, economic behavior, and performance (Libecap 1989: 1) and affect the economy in two different ways: 1) by assigning ownership to the resource with regard to who will bear the cost and who benefits and 2) by allotting the decision-making authority (ibid:10). Under conditions of full private property, an asset owner is entitled to use, rent, or sell the property. In the case of a sale, a collection of property rights is then transferred from one person to another. As a consequence, the value of any private property depends,

ceteris paribus, on the bundle of property rights that can be conveyed in the transaction (Furubotn and Richter 2000).

Property rights regularized the relationships between individual with respect to things, goods, and values. An individual can exert some power over an asset to consume, to obtain income from a property, and to alienate it through these rights (Verdery 2003: 18, Barzel 1989: 2). These rights indicate different relationships such as a relation to use: exclusive ownership means sole ownership or, in other words, the power or authority related to the resource, and obligation means one's act of binding oneself by a social, legal, or moral tie. Verdery (2003: 172) places emphasis on values and has discussed the values related to ownership and dignity.

Operational level property rights are dealt with by following types of rights: 1) the right of access means a person has a right to enter a physically defined area and to enjoy its benefits, 2) the right to withdrawal can be explained as the right for the holder to acquire the units from the asset and to utilize the units by his own choice, 3) the right of management is related to managing the asset in the form of quality and quantity, with the right-holder being responsible for maintaining things in order and up to date, 4) the right of exclusion determines the accessibility to the asset, with only the person who has an access-right being able to access the asset, 5) the right of alienation gives to the holder the right to sell or lease or both (Ostrom and Schlager 1996: 131-32). In the most general terms, property rights are described as social codes that define who has the rights to enjoy the benefits from the use of a certain asset. The "right" of someone means someone else has a duty to observe that right.

In the effective rights' system, there is always an authority to defend one's right in a particular outcome. If a person thinks that he has rights in such a specific situation, he can ask the authority about his claim. "The effective protection of his gain from this authority system is nothing other than a correlated duty for all others interested in his claim. A right is a triadic relationship that encompasses him, the object (the income or benefit stream) of interest, plus all others who have a duty to respect his right. Rights are not relationships between him and an object (or an income stream), but are rather relationships between him and others with respect to that object (or its associated income stream). Rights can exist only when there is a social mechanism that gives duties and binds individuals to those duties" (Bromley 1991: 94).
In the case of Pakistan, property rights are institutionalized as a part of the constitution. According to the constitution of Pakistan, Article 23, a person can own or sell his property in

any part of the country. In a further explanation of this article concerning the transfer of property act 1882, the owner can distribute his property among others or can transfer his property to someone. He is fully authorized to take a decision about his property with regard to its use. In the presence of this formal institution, the system also has some informal cultural and traditional force, which sometimes is crucial in the management of the resource.

3.2.4 Property Rights and Resource Management Regimes

Property right regimes are a human creation for managing the use of environmental resources (Bromley 1991: 21). The concept of the property regime is based on the definition of property given by Hallowell (1943) as a social relation and describes the relationship between the property holder and something of value (benefit stream) against other things (cited in Bromley 1990: 2). It is defined as the structure of rights and duties of individuals with respect to a specific resource. Property right regimes have a special quality to judge what is scarce and valuable (Bromley 1990: 2).

Institutional setups are continuously customized to modify the scope and nature of property regimes over the natural resources (Bromley 1991: 22). According to Bromley, these management regimes are of four different types: 1) non-property, 2) state property, 3) common pool property, and 4) private property regimes (ibid: 23).

In a non-property regime, no proper user of a resource is defined, and everyone can use the resource. In an "open access regime" (Bromley 1991: 30) access is free, for example, to lake fishery, pasture land, or fuel wood. In this case, the one who first controls this resource can obtain the maximum benefit. However, no one will manage the resource. Therefore, lack of management and ownership is a problem of this property regime. Hardin (1968) explains the common problem of open access in his article on the 'tragedy of the Commons': the over-utilization and exploitation of the resources without no responsibility for their care.

The term "state property regime" generally means that the state holds all rights in the resources and allots these rights to some specific authorities or citizen under certain conditions. Administrative bodies are allowed limited use, and control lies in the hand of the owner (Government) (Bromley 1991: 23). This is also known as public ownership; the value of the output is below the cost of production, and so public decision makers do not gain any benefits from their decisions and have few incentives to invest time and resources (Pejovich 1997: 61).

In common property regimes, the owners have the right to exclude people who are non-members and, vice versa, non-members have the liability to follow the restriction (Bromley 1991: 31). These are the rights of communities with respect to a particular locality or a group of specific ethnicity to a property. In other words, common property regimes involve a group of owners having their own common property with the right to exclude non-users from their group (Bromley 1991: 32). Members of the group have the right to decide about access and procedures of usage, but they cannot decide about the selling of these rights to others (Pejovich 1997: 64). Groups in the common property regime can change in size, nature, and structure, but they exist as units with their social norms and culture and own specific systems (Bromley 1991: 26). One group member cannot use the resource for his own interest (ibid); hence, all the resources are under the control of the whole group or a group leader.

The term "private property regime" expresses the authority of the owner who is conferred full and unconditional control on the property (Bromley 1991: 24). The owner of private property is legally and socially able to exclude others with the ability for the best use of the property (ibid: 25). The right of choice for an asset use and its assessment together with the transferability and constitutional guarantee is known as the ownership right (Pejovich 1997: 58-60); the owner can make changes in resources according to his wish and distribute his property to others (Eggertsson 1990: 33-7). The individual can decide on the management and investment for his property, can choose managers for his resource, and can draw up plans for future investments. This is socially useful as long as it is an inducement to industry rather than being a substitute to industry (Bromley 1991: 24).

In case of Pakistan, most land is owned by private owners, but they have rights only to a certain depth, as the land is the state's property below four feet, and in cases of any change or problem below the defined level, the landowner has to consult the land administration. In the case of deep drilling for tube wells, landowners are bound to request permission from the respective state department and have to pay some tax for the installation of this machinery on their land. However, land in general terms belongs to the landowners, and they are free to decide about any change regarding ownership or land use.

3.2.5 Transaction Costs

Property transfer rights and transaction costs: Transfer of property from one user to another one is highly dependent on government-protected property rights to stop violation or to discourage theft or other nonconsensual transfer (Mlceli and Sirmang 1995: 81). As discussed above, property rights provide a certain environment for human interaction (North 1990: 3), but for secure rights, some cost has to be paid as legal fees, registration fees, and title fees, which are known as transaction costs (ibid: 62). Williamson (1985: 1) has explained the concept as follows: "a transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates and other begins." The author has described three attributes for transactions: frequency, investment idiosyncrasy, and uncertainty. He has applied this to various types of governance structures, e.g., labor markets, regulation, family law, and capital markets (ibid 1979: 254). Transaction costs are the direct cost of inefficiencies in production (Allen 1999: 899). In this case, the transaction cost will be the sum of the investment and any increase in costs of production (Klein and Leffler 1981: 631).

Williamson (1979: 258) has explained the role of law to resolve issues related to family relationships. Conceding that adjudication helps in supporting out family affairs, such dealings are idiosyncratic to an unusual level, and specialized governance structure is surely the main mode of governance. With the increase of the role of law, reliability on internal structures is reduced. Therefore, unless individual rights are seriously threatened, withholding access to adjudication may be indicated and all such legal process increases the transaction costs.

Property rights have a monotonic relationship with wealth, and trade between these two explains the phenomenon of the transfer of property rights. If there is no trade, this is an indication of a lack of a factor such as property rights. If property rights are well stated, then trade is beneficial, and maximum wealth is gained; if property rights are poorly defined, then the case is reversed (Allen 1999: 898). When property rights are incomplete, people struggle to maintain their rights and the generation of more wealth, and this leads towards transaction costs (ibid).

Informal institutions and transaction costs: Williamson (2000: 598) explains informal institutions as self-created measures of society for protection against the "alien value". The

author has proposed an answer to the North (1991: 111) question "What is it about informal constraints that gives them such a pervasive influence upon the long-run character of economics?" For the answer to this question, the author has formulated a four-level framework and placed informal institutions in the first level. Williamson starts his analysis from informal institutions and ends at a market structure. With increasingly complex market and governance structure, he has emphasized transaction costs.

Social norms have a strong influence on economic activity and the functioning of economic institutions, especially altruism, which can never be ignored in theories of preferences (Koford and Miller 1994: 1). They play a vital role in the formal institutional setup, and because of a small change in them, a new environment with a new scenario is possible (ibid: 23). Habits, norms, and customs are social capital, which is not costless to produce, but this does not mean that every investment is economically efficient, although they can help in investment efficiency (ibid: 26).

These social norms, habits, and customs play a major role in markets such as daily routine business and dealing with customers, and the facilities provided by the buyer for his customers depends on these norms and habits (Koford and Miller 1994: 28). For instance, the time of arrival at institutes or offices and at which workers go for lunch together in the lunch break sets an example for new comers (ibid: 28). Williamson (1975) explains this aspect as "self seeking with guide", which means that a person has his own interests, and he looks for them. Social capital is very important for a society, but its composition and quality do not need to be optimal and can affect the development of a country (Stiglitz 1999: 67).

Value is an important notion for the property relation, as no one wants to share property against something they do not value (Verdery 2003: 20-1). Land has strong economic and emotional values to the extent that "people's behavior in relation to land mirrors the general state of interaction among members of society" (Sanjak 2000: 1).

Transaction costs can be considerably reduced by culture. In the presence of effective culture, communities have a strong moral binding, which can overcome many societal problems, which formal rules, by cashing high transaction costs, cannot. Thus, culture is helpful in reducing such additional costs and in enhancing the performance of the community and economy (Casson 2000:3). A strong cultural impact is prominent in the personalities and nature of the individuals of that community, e.g., if a culture is collectivistic with strong prevention orientation, individuals from this culture normally try to avoid failure. Similarly, in

the case of an individualistic culture, individuals are much more focused and follow the strategies pursuing success (Lockwood 2005: 1).

Sometimes these cultural impacts are problematic, as some people who believe in the culture have their own points of view on some issues, whereas others who do not believe in it have different attitude, e.g., with respect to resource use, some may not be in the favor of changes or selling, whereas others wish this to happen. As shown in Figure 3.1, if the individual is not willing to sell, this may be because of strong cultural effects on his personality.

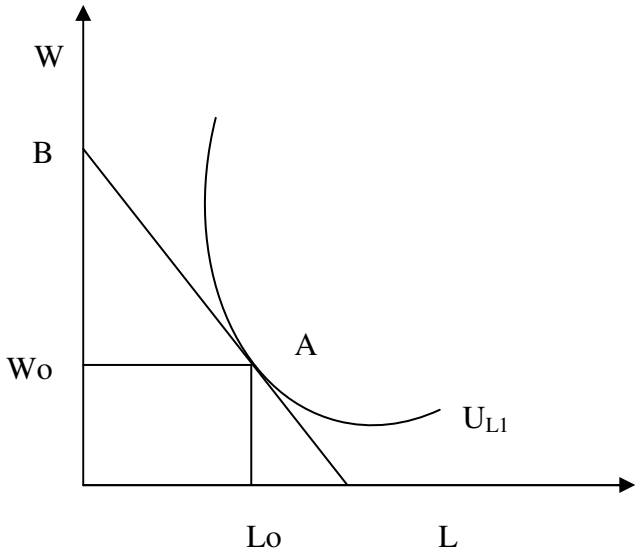

Figure 3.1: Utility of the Landowner who is More Inclined toward Land than Wealth
Source: Own presentation

Figure 3.1 depicts the utility function (which also reflects his norms) of the land owner for whom land (L) and wealth (W) are not the perfect substitutes; thus, the utility function is convex to the origin. The landowner places more value to the land as compared with wealth, and so his indifference curve is more toward the land axis. As Verdery (2003: 20-1) explains, land cannot be exchanged for fewer valuable things, and so U_{L1} starts rising after a certain point when the landowner is willing to leave his land for wealth. $\rho = {}^{w_o B}\!/_{w_o A}$ shows the degree of being worse off if the owner is forced to sell the land. The landowner is not in favor of selling land.

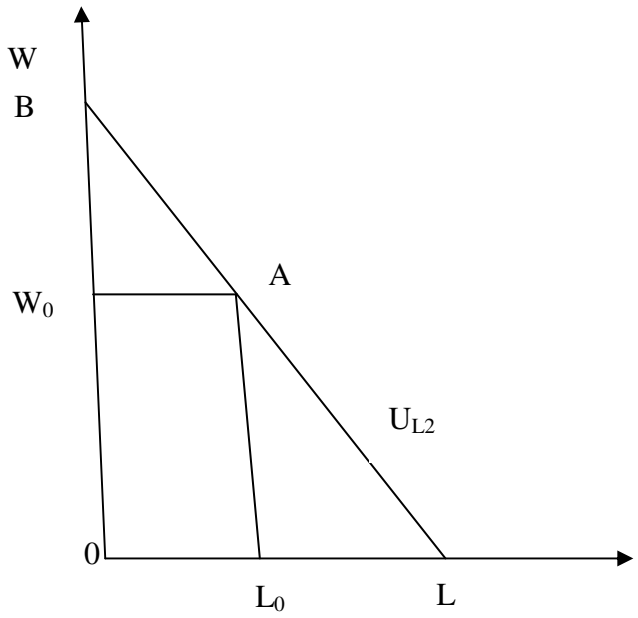

Figure 3.2: Utility of the Landowner who is Indifferent to Land and Wealth
Source: Own presentation

Figure 3.2 shows the behavior of a landowner with weak cultural impact, who is in favor of selling and considers land as a perfect substitute of wealth; thus, his utility curve is linear. The landowner wants to sell land (L) for the gain of more wealth (W), and his utility is $\rho = {}^{w_o B}\!/_{w_o A}$. Both types of landowner want to maximize their utility and are not ready to abdicate their rights. This causes conflicts between families.

For avoid such a situation of conflict, transaction costs play a role, e.g., in the case of contracts, transaction costs are involved, which landowners and land users both try to minimize. These costs are the part of private transaction costs, which are paid less attention (Viaggi 2008, 1). These include characteristics of contracts, information gathered for their decisions, payments for the consultants and extra labor, and administrative costs connected to these contracts. Sometimes, these costs are difficult to define when we add risk, expectations, and subjective attitudes to them. According to the Pakistan Stamp Duty Act 1899, contracts in cases of the transfer of power over land, such as power of attorney or the guardianship of the land for minors under the age of eighteen years, transaction costs are involved as duty, registration fees, and other administration costs.

3.2.6 Land-use Change

Land-use change is the process that includes the arrangements and activities performed on certain land cover to produce change or to maintain its existing condition (Ahern and Alig 2006: 11). Land-use is the way in which land is subjected to produce that serve human needs, and generally change is related to its exploitation for agriculture, industry, residents, and recreation. Land-use change has two distinct categories: 1) direct causes, known as proximate, which explain the direct human modifications to that land, and 2) underlying causes that are indirect, with a discussion of the reasons that are the root cause of these changes (Lambin and Geist 2007 :2).

The reasons for land-use changes can be found in the preferences of landowners and the different options available to them for such change. Economists believe that this process is driven by economic gains (Lourenço et al. 1999: 1), e.g., landowners will prefer the option that would be economically efficient and give them maximum returns (Segerson et al. 2006: 79).

Human involvement in shaping the environment through land-use change has had a significant effect on the functioning of land (Turner et al.. 1995: 3); for example, for extra returns, landowners use fertilizers and pesticides, which cause water pollution and soil degradation. Sometimes, the neighboring land is also affected by the action of a farmer. Hence, the transformation in land use is not always socially efficient, and human decisions on land use do not necessarily favor society (Segerson et al. 2006: 80).

Land-use change has different reasons in Pakistan; the major reasons are a change in the natural environment which has an impact on the decision of humans for land use. Poverty is another strong factor for changing the mind of landowners, as sometimes poor landowners alter their cultivation practices or, under severe conditions, they sell their land and transfer all the rights to some one else in order to fulfill their urgent needs. Changes in economic policies related to land also affect the mind of a landowner; for example, the reduction in subsidies on seeds and other agricultural inputs increase the cost of production and decrease the overall returns of the landowners. Culture and traditions are also of personal interest and have a value for the land users and landowners. Similarly, demographic fectors are important in the case of land-use change, in which the population is a very strong factor, as in the case of migration from rural to urban areas or in city expansion by using agricultural land from rural areas.

Together with all these factors, property rights also play a significant role in land-use change (Lambin and Geist 2007: 3).

3.2.7 Conflicts

Conflicts are the situations in which parties have no common or even contrasting interests. Such kinds of situations occur on the basis of some differences that can be the results of the values or belief systems of the parties or that are attribuTable to the access or the distribution of power and resources (Upreti 2004: 1). "Conflict occurs when two or more people oppose one another because of difference in their needs, goals or values. Usually it has been observed that conflict is almost always accompanied by feelings of anger, frustration, hurt, anxiety, or fear. When the latitude of tolerance crosses the bottom line then conflict occurs". Feelings of unfairness, spite, reputation formation, injustice, and mistrust are possible sources of conflict (Falk et al. 2003: 1; Warner 2001).

Different types of conflicts can be evaluated on the above-mentioned basis, e.g., relationship conflicts, which occur in the presence of the negative behavior of parties, and which cause misperceptions and negative emotions. The conflicts act as a fuel for destructive conflicts. Value conflicts are the results of different beliefs, which give meaning to the actors' life. If some actors impose their beliefs on others, the contradictions between them cause conflicts. Similarly, interest-based conflicts evolve from competition over perceived incompatible needs. In this case, actors believe that others should scarify their interests. Various reasons are given for interest-based conflicts, e.g., substantive issues (money or some physical resources), procedural issues (ways adopted for the solution of conflicts), and psychological issues (level of perception about trust and fairness) (The Oregon Mediation Centre (OMC) 2001).

Resource-based conflicts, particularly over rights of land accessibility, are increasing with time in both frequency and intensity. Basic reasons for these land conflicts are greed or grievances because of the scarcity of useable land. These conflicts cause serious social dislocations, suspend or destroy income opportunities, create food insecurity, damage the environment, and frequently result in the loss of life (International Conference on Agrarian Reform and Rural Development (ICARRD) 2006: 2). Along with all these reasons, these land conflicts based on land use cause land degradation, which is a growing problem of today.

Kenya is an example of scarce land resources, and land-use change is the basis for conflict (Cambell et al. 2000: 339). Mostly farming originally occurred along rivers, around swamps and areas near the water margins of the rangeland. Because of this, farming, the access and availability of water, and grazing for both domestic stock and wildlife have become reduced. This increases the vulnerability of herders and of other farmers who have less access to water; this has caused conflicts among farmers and land users.

In Pakistan, mostly resource-based conflicts have occurred because of avariciousness and for the maximization of utility. As the actors involved have different interests and values, the contradictions between their approaches cause serious issues, leading to the conflicts which sometimes cause resource damage. In the following study, some aspects of these conflicts will be discribed.

3.2.8 Land Distribution as Main Reason of Conflict

Land dynamics are highly specific and rapidly changing, and the conflicts related to them escalate to violence. Sometimes, these conflicts are caused by changes in the structures of power governing the management of resources in rural areas. These changes are necessary to achieve greater efficiency and equity, but some interest seekers, who are the beneficiaries of the system in place, oppose such transformation in agriculture. This dissidence is bound to be spoiled by conflicts of various intensity levels. Land with all its material and symbolic values is at the core of these conflicts (Organization for Economic Cooperation and Development (OECD) 2004).

Land has an important cultural significance among communities, particularly for rural and tribal people for whom cultural identity and survival are strongly linked to their relationship with ancestral territories. For a fast-growing population and further development, the land and resources of such people are increasingly sought after by outside parties, who bring a different understanding of conflict. Most of these disputes are based on the different concepts and positions on sovereignty and ownership of the land, including resources on, below, and above the surface, and the non-commercial value of land and resources (ICARRD 2006: 3).

A more compelling argument is that land can be a permanent source of income for poor families. Heads of families might not always act in the collective interest of their families. If there are conflicts of interest within the family or between current and future generations, the goal of redistribution may be better served by giving the family an asset other than money.

Doing so might, for example, prevent a husband from decamping with the financial assets, leaving his wife and children destitute (Banerjee 1999: 8).

Pakistani culture can be characterized as highly power distant and male-dominated. This type of culture has a tightly knit social framework in which an individual can expect his relatives to look after him in exchange for unquestioning loyalty (Hofstede 1984: 150). Primary social organization is kinship, which is called "biradiri" in the local language. The concept of biradiri beyond the immediate core family includes cousins and parent's cousins (Afghan and Wiqar 2008: 8). Kochanek (1983) has nicely explained the attributes of the biradiri system in Pakistan in terms of loyalty and norms to support each other and respect the decisions of every senior member of the biradiri. A high level of trust is developed among the members. Pakistani culture is considered to be of high value because a typical organizational hierarchy is present with a centralized power system. Power lies with the head of the family who is the senior-most member of the family, mainly a male member (father), and everyone is tied by strong relationship to each other (Ansari and Bell 1991).

Sometimes, family members do not behave in responsible way, which can alter the nation's luck. In such situations, this joint family system creates problem for the whole of society (Razzaq 2010: 3). In this research, some conflicts at the household level are highlighted; these increase unrest and dissatisfaction among the family members and among their relations and create problems when they demand their rights.

Some loopholes of property rights related to land distribution and land transfer rights, such as verbal gifts[7] and cases of irregular sale[8] (Pakistan Institute of Development Economics (PIDE) policy view points 2007: 4), also support the evolution of such conflicts. A landowner makes a gift of his land to someone; this may occur via a verbal declaration, which causes some conflicts at the time of possession or an execution of the Act Section 122 according to the property right act 1882. Similarly, the constitution permits a person to transfer his rights to a person, in some particular cases as the power of attorney. A person can appoint more than

7 According to the Section 122 of the Transfer of Property Act, 1882, Gifts are defined as "the transfer of certain moveable or immovable properties made voluntarily and without consideration and accepted by or on behalf of the donee". To make gifts of immovable property, section 123 Transfer of Property Act, 1882 stipulates that "the transfer must be affected by a registered instrument signed by or on behalf of the donor, and attested by at least two witnesses." In other words, in order for gifts to convey an interest in the immovable property, the Transfer of Property Act, 1882 requires such gifts to be made in writing.

8 Section 54 of the Transfer of Property Act, 1882 defines a sale as "a transfer of ownership in exchange for a price paid or promised or part-paid and part-promised." In the case of tangible immovable property of the value of more than Rs 100 or of the reversion or other intangible thing, The sale can only be made by a registered instrument

one attorney. At times, these attorneys are involved in irregular sales, which are unregistered, and such sales cause problems with regard to property rights. All these cases will be discussed in Chapter 5 in detail.

Access to land and rights related to the use of land and land management, structured by government polices are important for the security and sustainability of the land, but sometimes different relaxations allowed in laws, according to the culture and environment of the area, cause a critical situation both for the landowners and the land itself in the form of conflicts (Alston 1999: 3). One of the reasons for conflicts of interest is the land-use change, and this land-use change causes land degradation, because most of the decisions of landowners are not socially efficient and create an externality as in the form of biomass reduction (Johnson and Lewis 2007: 164) because the land is used for non-agricultural purposes. This study will also explain such conflicts related to land-use change, which may be related with land distribution.

3.3 Analytical Framework

The Institutions of Sustainability (IoS) framework introduced by Hagedorn et al. (2002) is a logical and effective framework for interactions between humans and nature. According to this framework, the social system and natural system both exert effects on each other; hence, transactions take place. In case of these transactions, some institutions are required, which are known as the IoS?

Hagedorn et al. (2002) explain some features, e.g., why we need institutions and the reasons to make changes in these institutions. According to their understanding, the interaction between nature and actors creates conflicts, and these conflicts cause the innovation of institutions. On the other hand, these institutions need specific sort of governance structure for their implementation and for checks and balances of these institutions. Nature and actors interact in an action arena; they are affected by exogenous variables such as properties of transactions, properties of actors, property rights of land, and governance structure.

Hagedorn et al. (2002: 1-3) have discussed four factors for such a specific setup of sustainability as shown in Figure 3.3.

- Properties of Transactions Affecting the Natural Environment and Ecological System
- Characteristics of Actors Involved in Agri-environmental Co-ordination

- Property Rights to Nature Components Related to Agriculture
- Governance Structures for Regional or Local Agri-environmental Co-ordination

Both physical properties of transaction and physical characteristics of the actors are necessary for institutional analysis (Hagedorn 2008: 358). The environmental problem (land degradation) is the result of agricultural activities performed by some actors or group of actors. *Properties of transactions* are excludability, rivalry, and asset specificity (Hagedorn et al. 2002: 4-5).

(1) Excludability of actors from the access of the land depends on the cost and mechanism. A well-defined mechanism is required to stop people accessing the land, being not entitled or having limited access rights, otherwise cost in the form of land loss will be borne by right holders.

(2) Rivalry is based on the amount of the distribution among users or the share of goods, which is cannot be equal for each type, except in some cases, such as air. In cases of land and other public goods, a greater share for one actor reduces the share for the others.

(3) Asset specificity can be defined in three different ways: 1) site specificity meaning the location of the resource, 2) capital specificity, e.g., information about investment, and 3) specific knowledge, which the users collect to develop the environment.

(4) Frequency of transaction is based on the condition of the resource and environmental conditions together with the utility of the farmer. This is different for different crops; annual and seasonal crops frequency will be different, and cash crops and pasture frequency are different.

(5) Uncertainty is concerned with the weather conditions, and other environmental and natural problems play a major role in the demand and supply of agricultural environmental goods and services. Transaction costs are involved in reducing these uncertainties because farmers and policy makers do not know the exact timing of these uncertain situations, and precautionary measures are also very expensive.

(6) Legitimacy is important in order to answer the question of some actors' role over land, as to whether their decision about the transaction is compatible or not. This property is related to decision making and influences which decision is more appropriate under various situations.

Actors are of different types acting at different levels; for example, some actors are involved in policy making at the national level, and some at the regional level, with some actors being involved only in an action situation and not playing any role at an administrative post. *Characteristics of the actor* are the values and beliefs of the actors, which are totally dependent on their attitude. Cooperation and reputation among other actors for their credibility is also a highly important feature, as is their knowledge for using and acquiring the land (Hagedorn et al. 2002: 6). Resources affecting agri-environmental strategies at regional and local levels by direct participation and disturbing political decision making at a higher than the regional level, in which land users cannot participate directly, are also special kinds of characteristics of actors. The social setup in which they live and deal with the matters of their daily life, and the selection of their method of action are also very important features.

Another factor is property rights, e.g., the right to use, to sell, to distribute, or to alienate. In the case of natural resources such as land or soil, all these rights are not categorized separately and are collectively called property rights, which can be private, common, or property of state. The process of creation and implementation of property rights takes place through transaction costs (Hagedorn et al. 2002: 8). These costs are substantial, because most of the environmental attributes are properly provided for their calculation and are highly sensitive to changes in the evaluation of any environmental attribute (Hagedorn et al. 2002: 8). These rules and actors with resources in an action arena perform actions, with a resulting outcome. Rights and duties are conditional on use (of rights) and fulfillment (of duties) and are defined in the various property regimes, e.g., private, collective, state property regime, or open access (Hagedorn 2008).

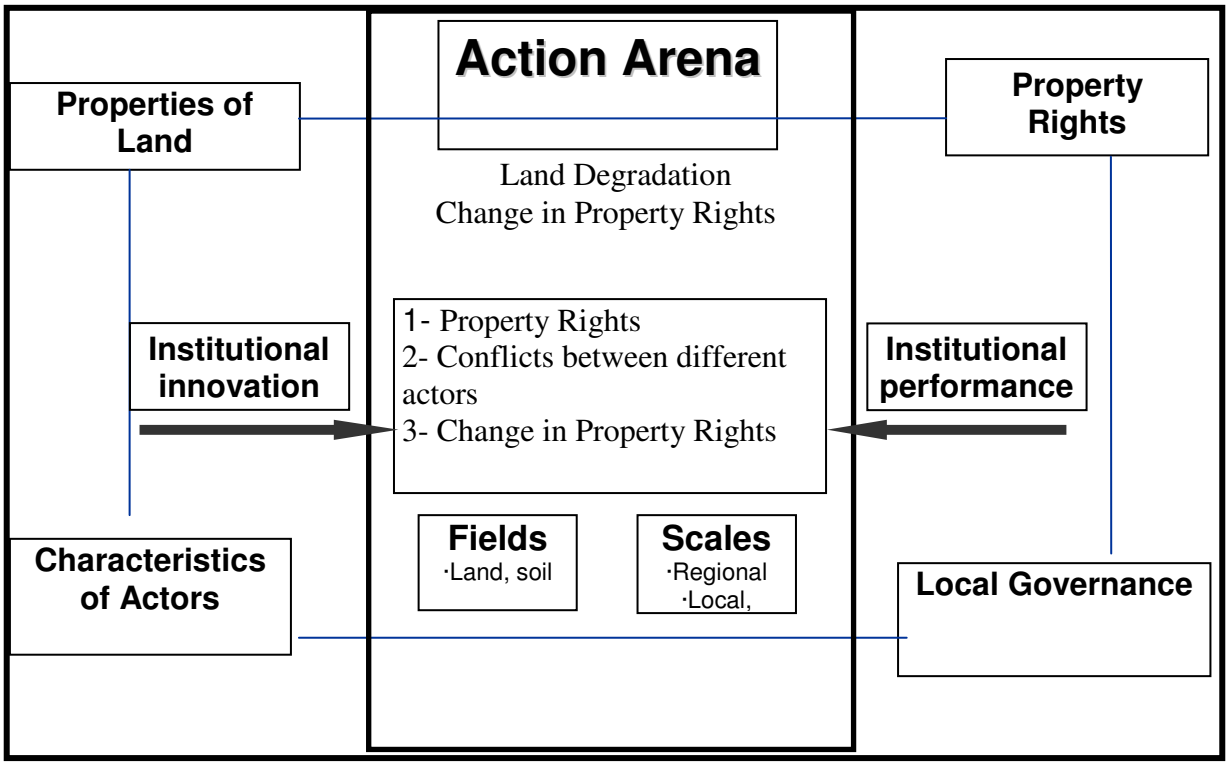

Figure 3.3: Framework for Institutions of Sustainability

Source: Adopted from Hagedorn (2008: 360)

Governance structures control all of this setup, as Bromley (1991: 94) emphasizes that when an individual claims his right, he can ask a state to defend his right in any particular outcome. In new institutional economics, three types of governance structures have been considered: 1) market, where trade takes place, 2) hierarchies, top-down or down-top managements, 3) hybrid forms based on contracts (Williamson 1985). Hagedorn et al. (2002: 10) have explained further aspects at the regional and local level to support sustainability as knowledge and information system, a formal and informal system, the rules and procedures for conflict resolution, the distribution of costs and benefits, and the regulation of liability, incentives, and opportunities to permute innovation and learning.

3.4 Framework for the Analysis of Land Degradation

The theoretical framework is drawn on the base of the IoS as shown in Figure 3.4. Land properties play a major role among the actors in a particular social environmental setting.

***Land properties*:** Geographically, the land is situated between three main industrial cities. Grand (main) trunk road, which links Lahore and Rawalpindi, passes through these regions;

some other branch roads also provide a good transportation network for this area. Its value is very high from a development point of view, as industrialists and building corporations can earn substantial profits from this land. Landowners are completely aware of this situation and have knowledge about their profit in cases of agricultural or non-agricultural use. Although the land is degraded, most of the landowners do not want to sell it and want to keep it for themselves.

In this situation, excludability might cause high transaction costs, as in the case of the exclusion of a family member from the use of a resource; this person might approach the legal authorities and bear the extra charges for a solution to the problem. Similarly, the degree of rivalry will be also high. Landowners have knowledge about the present and future value of their land based on its geographical location. They have different opinions about land use, some of them wanting to reclaim the degraded part of the land for the agricultural production, and some not being interested in further investment and wanting to use it for non-agricultural purposes, either by themselves or through another external actor. If both the ecology and landowners are in favor of agricultural land use, then they will go for it, which would be favorable to the overall economy. As Pakistan is an agricultural economy, it would be extremely beneficial for this sector to develop policies for the reclamation of land for agricultural production.

Actors: Different actors are involved in this case, e.g., land owners, government officials, real estate builders, and industrialists, and every actor has his own value and interest for land use. Landowners play a central role in the action arena, as family conflicts are related to different stakeholders, within the family. Because of wrong perception of traditions, which are often abused for self interest, the shareholders of the family estate suffer due to improper land distribution. Conflicts arise because of their concepts and family traditions, which develop their interests. Landowners can be categorized, according to this family culture, as farmers who believe that land is of high prestige and a matter of honor for them and who are interested in gaining agricultural output from their land. At the same time, a group of landowners might see the land as an asset and want to use it for greater personal profit through non-agricultural use or by converting it into money. This can be achieved by selling it to other land users with their own interests, such as real estate builders, who can earn a profit from this land after the construction of a housing scheme, and industrialists, who can minimize their cost by building industry here.

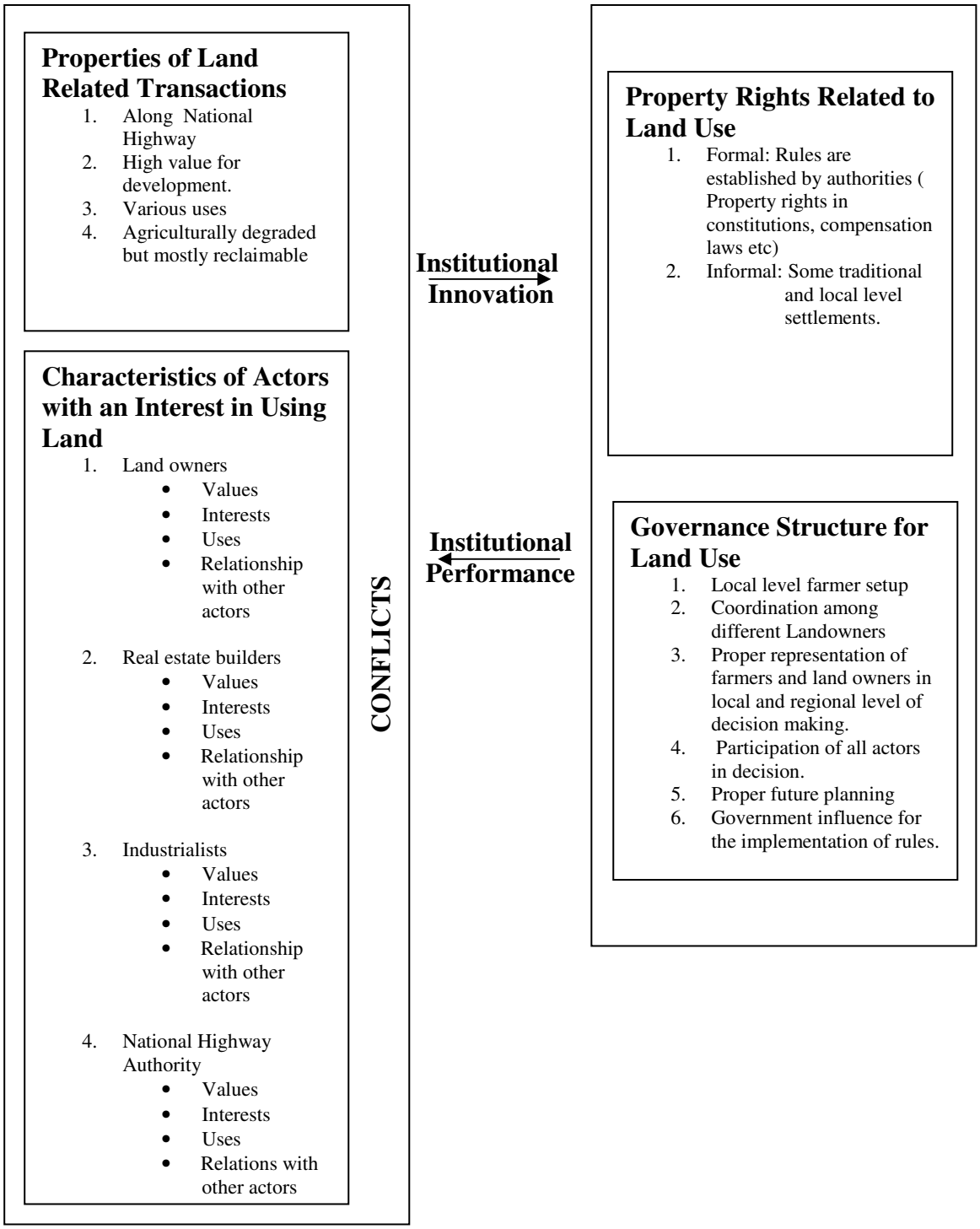

Figure 3.4: Framework for Analysis of Role of Property Rights in Land Degradation and Land-use Conflicts

Source: Based on Hagedorn et al. (2002: 4)

The reputation of the actors among the others in the society and their commitment to their actions indicate the proof of their credibility. In cases of bargaining or any sort of dealing related to land, their knowledge plays an extremely important role.

***Action arena*:** Landowners, with different cultural backgrounds and interests, face a disturbed and troubled situation, in which they cannot enjoy their rights fully; conflicts thus arise. These conflicts are resource-based and occur because of the management of the natural resource, which is currently prone to a wide variety of rapidly changing development pressures. These pressures are exerted on landowners in number of ways, so as to maximize their profit, the distribution of land, and land-use change. Some landowners are attracted by the offers of other actors wanting them to sell their land. On the demand of their share in property, conflicts occur that cannot be avoided without a proper institutional setup. These conflicts cause resource damage, e.g., the degradation of the land (Figure 3.5).

***Institutions*:** *(1) Social norms and setup:* Social norms and culture involve organizing human behavior to agree with the expectation of others (Durlauf and Blume 2006: 69). Norms deal with a wide range of concepts, including property rights, contracts, bargains, forms of communication, and concepts of justice.

In Pakistan, the culture of the patriarchal combined family system has a strong hold on the decision-making of landowners. Most of the families do not like to distribute land, as it is against their traditions. They consider land as indicating their social status and as a power symbol. An unequal command and access to property occur between different family members. Although, every member knows about his share of land, most of them are bound to live in a combined framework, because this is their culture. The legal members are deprived from gaining access to their share, and in some cases, loopholes of formal laws are supportive of such culture.

(2) Property rights: If an individual or a group of individuals has/have 1) the right to possess, 2) the right to use, 3) the right to manage, 4) the right to the income, 5) the right to distribute, and 5) the right to alienation, then he (they) is (are) the owner (s) of the land. In other words, he (they) relates to a particular stream of benefits and bear costs from the goods in the case of ownership.

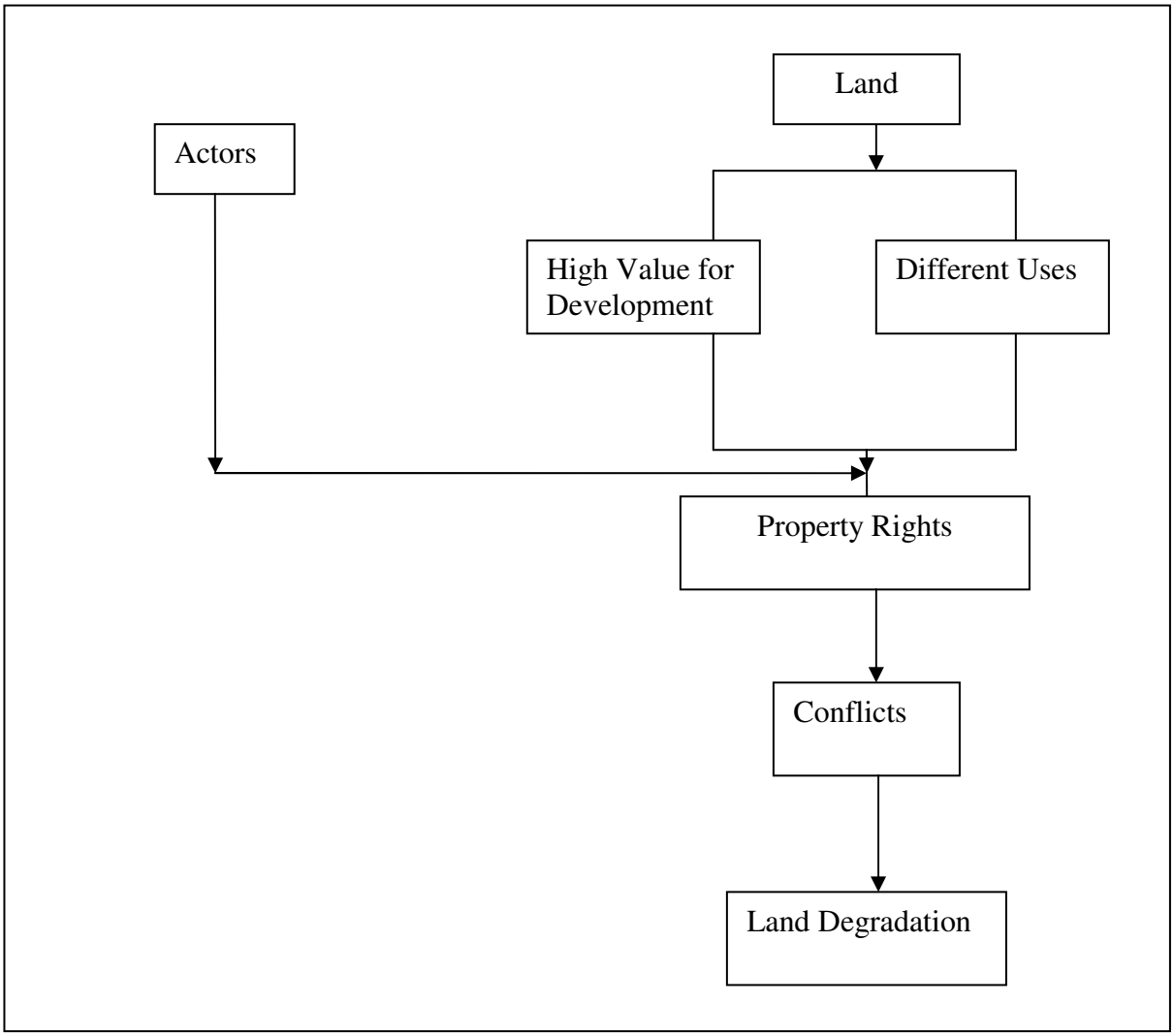

Figure 3.5: Action Arena for Land Degradation and Land-use Conflicts

Source: Own Presentation

As explained in Section 3.2.6, the law of the `transfer of property act´ has some ambiguities relating to oral declaration and irregular sales. These anomalies of the law cause problems at the time of distribution, and some severe family conflicts arise in the presence of a strong culture. These conflicts sometimes take far too long to decide. On one hand, the actors who have sources of income other than land can easily maintain their lifestyle. They are in the better position of bargaining and can spend more time over the settlement. On the other hand, the actors who are totally dependent on the land are in a weak position of bargaining and cannot obtain a sufficient amount of output because of improper timing and poor land conditions. This delay in the outcome of a decision causes falls in agricultural output.

Similarly, any land-use change, which is related to the economic utility of the landowners, is also effected by the influential group, as they can forcefully impose their decision of land-use change upon the other actors. This land use gives them maximum utility and profit, but the net social cost of these decisions will be very high, for example, over-utilization of land resources cause soil degradation, not only on the concerned plot, but also on other neighboring land.

Governance structure: Land is owned by private owners basically belongs to the state, and only *four feet* of land ceiling is allowed for use by the farmer; government has thus given the rights to private owners (Land Reforms 1972). For the usage of this land, the landowner has to pay revenue, which is determined by the District Officer of Revenue (DOR). The land registration system[9] is a long hierarchy, which is very complex and not easy to understand. Local governance structure is arranged as a top-down management of some bureaucrats who are not particularly helpful in dealing with the problems of landowners, as they consider themselves as being more government officials rather than representatives of the local people. No specific environmental policy exists that supports their decisions about land use. Local governance is not responsible at all for the conservation of the land resources.

3.5 Conflicts among Actors Regarding Land Degradation

The relationship of land and conflict is very complicated, because land is connected not only with the traditions, culture, and norms, but also with the legal and public administration system of the society (ICARRD 2006: 2). This means that it is a mixture of both economics and politics. At the same time, when related to conflicts, issues become more complex, after tie-ups with power, laws of property, economic incentives, and inequalities of the system. A situation of grievance can easily be found in wider and deeper rooted conflicts. To solve the land issue, it is necessary to dig deep into integrated and interdisciplinary matters in order to have a better understanding (ICARRD 2006: 2).

Campbell et al. (2000) have discussed the cases of scarcity and control of land resources in Kenya in which the population has increased, and the scarcity of land and water issues create a problem. Market liberalization and the trade in horticulture are unable to solve the problem because the institutional setup is not effective. “Land management and resource allocation system is totally controlled by power. Power is vested in people and institution with different

[9] The Land Registration System will be explained in Chapter 5

political, economic and social status and different influence over civil authorities and public policy" (Bryant 1998).

The causes of conflicts related to land arise because of the competition over scarce land resources (access, control, use). Some ambiguity exists over ownership and legal arrangements, and hence, a social relationship in land conflict always involves attempts to gain control of the land. The different perceptions, attitudes, and behavior of people in respond to land, for example, the increased interdependence over land resources (landscape and land-use) and contradictory regulatory provisions make the situation complicated. The conflicts occur because of lack of basic understanding of the relationship between land and people and unwillingness of landowners to respond to changing social, political, technological, and economic behavior. (Upreti 2004: 2).

Brazil's Amazon is an example of the ambiguity over ownership and legal arrangements. Titles for land in Brazil are as legal as in United States; for example, the title holder has to pay taxes, has the rights to use and to arrange the titles according to his will, and can take goods back from those who take them unjustly. Some ambiguities exist in the law of Brazil, e.g., in the recent constitution of 1988, shareholders can claim government land and can occupy up to fifty hectare of vacant private land. If they develop this land for five consecutive years without opposition of the owner, they can obtain the title through adverse possession (Alston et al. 1999: 165). This unclear definition of land institution invites dispute on land distribution, which provides a fertile ground for land conflicts.

Unfairness, injustices, anger and mistrust also lead to land conflicts (Martinelli and Almeida 1998: 322), as every actor attempts to destroy, influence or control the land of the other actor (Jacob and Schreyer 1980: 370). Knight (1992: 164) has discussed the problem of the distribution of property to the next generation after the death of the owner. The transfer of property represents the security of the future and well-being of the heirs and determines the status of the deceased. Mainly, property is distributed among the spouse and children of the deceased. He has characterized this problem of property transfer as a problem of asymmetric power between shareholders. The shareholders' concern is for the protection and the betterment of their future. The only asset is the family estate, and sometimes the efforts to attain these goals cause conflicts between or among families and disputes with attorneys. An explanation of the development of inter-state succession rules can be found in 1) the effects of the rules on these conflicting goals and 2) the alternative sources of economic well-being for

the actors (Knight 1992: 168). This concept will help in understanding the situation of land owners for this study.

The distributional theory of institutional change deals with the problem of land distribution as in the agricultural economy; asymmetric power10 is in the hand of the parents or some other senior member of the family who has an attorney to control the family estate. They can introduce rules according to their own ideas, in the absence of a formal will of the deceased, or for their own interest. For instance, they can introduce unigeniture rules that maintain the estate as productive as before and tie all the other family members as one unit (Knight 1992: 168). These rules may or may not be beneficial to the heirs, e.g., in the commercial economies, the remainder of the children who have other sources of income, and whose parent is dependent on them, are in the better position of bargaining (ibid). They can force a parent to change their decision.

The key features of this theory of bargaining are asymmetry, credibility, risk aversion, and time preference (Knight 1992: 129). The asymmetries of power are the factors that affect the attitude of strategic actors to determine institutional change. It is necessary to take into account that some social actors are more powerful than the others and know about those differences. These actors can force the other actors to choose a particular equilibrium strategy according to their preference and will act in accordance with whether they wish to do so (Knight 1992: 127).

In the case of land distribution, Knight (1992: 127) starts with an informal rule formation for the distribution of land. Different sets of preferences are available and actors structure these rules as per their independent activities (ibid: 128). More than one set of rules can satisfy the situation; because of this multiple choice solution, people enter into conflicts with preferences (ibid), and the result is bargaining. Three possibilities can occur: 1) all parties agree with the same decision, which is beneficial for all, 2) there is a conflict of interest about which agreement to conclude, and 3) instead of agreement, a decision is imposed on any one or by anyone without approval (Osborne and Rubinstein 1990: 1).

Knight has discussed the prisoner's dilemma game to explain the bargaining theory (Table 3.1). This game has two alternatives for two players (Knight 1992: 129).

[10] Power asymmetry means that power is unequally distributed; on the other hand, "the consequences for the low-power person are usually clear – he will enact responses or make other changes which the high power person desire" (Schopler 1965, cited in Dwyer and Walker 1981: 106).

Table 3.1: The Basic Bargaining Game

Player A	**Player B**	
	L	R
L	Δ_A, Δ_B	$x,\ x+\varepsilon_B$
R	$x+\varepsilon_A, x$	Δ_A, Δ_B

Source: Knight (1992: 129)

Where $\Delta_{A;B} < x$ are the two equilibrium outcomes of the game for the L, R and R, L strategic combinations. The Δ values are the pay offs, which actors have to pay in case of failure to attain equilibrium. $\varepsilon_{A.B}$ are the distributional advantages that every actor wants to obtain.

Convincing others to undertake a particular action is not sure. If "A" player wants to play 'R', then he should constrain the actions of player "B" for the selection of Game 'L'. "A" can improve his credibility by changing his profit situation obtained from his outcomes. In this way, he can assure player "B" of his selection for game 'R'. His credibility will force player "B" to choose the 'L' game.

Risk is based on the choice and relatively amount of the cost of breakdown. The breakdown cost is calculated through the equilibrium values. As players are in equilibrium, we can say that there is no asymmetric power in the game, and so the non-coordination cost is zero $\Delta_A = \Delta_B$. In case of $\Delta_A > \Delta_B$ "B" bears more breakdown cost, which means that "A" has the more power of choice. There is a positive relationship between ownership (choice) and risk acceptance and a negative relationship between ownership and risk aversion (Knight 1992: 133).

The time preference is related to the time frame for achieving a successful solution of the problem. If an individual has more resources, then he would be more patient and less dependent on bargaining outcomes, which is a time-consuming process.

Rules of intestate11 are affected by the bargaining power of the children with their parent. If the children have an extra source of income, then they are more powerful, and they can force parents to act according to their will. In most cases, the situation is reversed, and the children do not have an economic alternative, so they have to live with their parents. “This situation in fact works against the parents or the eldest son, because the set of feasible working rules are discontinuous. Unless a private arrangement is worked out (a will), the set of alternatives will be limited to one child, equal division, or some discontinuous division of shares” (Knight 1992: 168).

Table 3.2: Key Features of Distributional Theory of Institutional Change

Feature	Effects of Bargaining
Credibility	Relative bargaining power
Risk	Relative bargaining power
Time preference	Relative bargaining power
Total Cost	Relative bargaining power

Source: Adapted from Theesfeld (2004: 84)

Bargaining sometimes occurs between the remaining parent and the children, between the children and other family members, or among children. In cases of conflict, the actors who have other sources of income are in a strong position of bargaining and can take the risk of a long bargaining process, which might be costly. In the case of land, average revenues fall continuously, while the average cost increases and output level is very low as shown in Figure 3.3. A low level of agricultural output means land degradation (Johnson and Lewis 2007: 164). This low level of output may have different reasons. Here, we will mainly discuss conflicts based on land distribution; this might represent a high total cost as the sum of loss in productivity and other expenditures, e.g. the court fee.

[11] Different types of rules are under observation for the distribution of the property of the estate in this case. 1) Primogeniture in which the elder son is responsible for the well-being of the all other family members, and he has to look after the property and the family of deceased (Menchik 1980: 1). 2) Ultimogeniture, in this case, the responsibility is transferred to the youngest son. Some parts of Ireland had the same practice (Crada 1980: 2). 3) Another practice, which is early observed in many Islamic societies, is based on the equal distribution of property among sons and a half share to daughters and extends the distribution even to an explicit percentage of the estate for the spouse (Makdisi 1984: 107).

From this discussion, we will explore our first hypothesis, as "*Intergenerational land distribution creates problems not only in social terms, but also in mismanagement and resource degradation.*" This hypothesis will be tested for the case study region in Pakistan. The preposition is "*the ways in which the land distribution and land transfer rights are implemented and cause land degradation in the region. Both these variables have negative effects on the land distribution*"

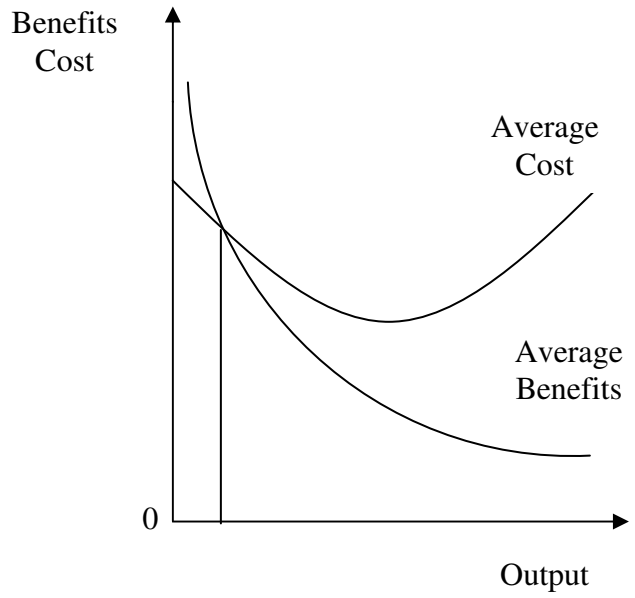

Figure 3.6: Situation of Output if Conflicts take too Long to be Settled
Source: Own presentation

3.6 Property Rights Systems for Land

The ability of individuals to produce their living or increase assets is dependent on their access to resources and the ways that they efficiently use and control those resources (Berry 1989: 1). In agrarian societies, land has played a major role as a means of living for generations, for the accumulation of wealth and the transfer of an asset to the next generation. Land property rights determine the social status of the households (Deininger and Feder 1998: 1), and structure the use of natural resources, particularly in the case of its maintenance for the long term (Beaumont and Walker 1995: 1).

Demsetz (1965: 354) explains the case of resource use with the help of three property regimes: communal, private, and state property regimes. In the case of the communal property regime, if one member wants to maximize his communal right, he will hunt more frequently. This has a negative effect on the rights of all other members of the community and causes a strong need for negotiation among the members. The costs could be very high, because it will be difficult for some members to reach a particular point of agreement. In the case of private land, the owner wants to maximize his present value by taking into account alternative future cost-benefit streams. He is interested in the best selection of his present rights for maximum present values. "The state, the court, or the leaders of the community could attempt to internalize the external costs resulting from communal property by allowing private parcels owned by small groups of a person with similar interests." A private owner can reduce costs and use resources efficiently and tries to maximize its present value (ibid: 356).

Hector Saez (1997: 1) has also examined the problem of land degradation by examining state farms, cooperative farms, and family farms. The author suggests that the family farm system is the best for resource conservation. He concludes that these farms change with respect to soil modification, plowing time period, and small scale deforestation (ibid: 483) because of human interference. Although state farms use state-of-the-art techniques of cultivation, these methods cause degradation in land, e.g., more use of fertilizer results in contaminated water. State farms are overstaffed with inefficient labor (ibid: 483). Small scale farms have the advantage of efficient workers who spend more hours on their fields and have more information to prevent their resource from degradation (ibid: 483).

Larson and Bromley (1989: 235) have discussed two fundamental concepts related to land degradation and property rights: 1) the control of a resource must be vested in a well-defined group for socially efficient use the called composition axiom, and 2) a well-defined groups must also act with a unified purpose known as an authority axiom. They explain that land as private property is better than that in the common property regime. This priority of private property is attributable to two different reasons; first, groups are not competent to use resources according to the preferences of the society, and secondly, individuals with distinctive authority are capable of using resources according to the societal preference in a specific time frame. Private users are always efficient in the management and allocation of resources, whereas the group cannot use them effectively, which causes resource degradation (Larson and Bromley 1989: 236).

The resource degradation issue is related to property rights only because of a misconception of the property rights' regime of common property with open access (Bromley and Cernea 1989: 6). In developing nations, land degradation is caused by the 'common property systems', which is the result of some local level institutional setup of resource use. This system is established by powerful rulers, local administrators, or family heads. The interest of the whole group is the same at the beginning, but gradually, because of differences, heterogeneous interests, and an unequal concentration of power, there are chances of excludability from resource. As a result, deterioration and degradation of the natural resources are observed (Bromley and Cernea 1989: 10).

"An individual property right in a resource is a claim of value that the owner of the right can expect to be enforced by some power" (Larson and Bromley 1989: 237). It is not compulsory that a party holds all property rights; sometimes, another individual has certain rights. Restrictions are imposed on certain behavior by state, community, family, or kinship (ibid).

The transfer of land from one person to another is a beneficial process, but only in the case where the new owner is more efficient and a good manager and has better ideas for its usage. Normally, land-use change causes bad effects and degradation of the land. Its major examples are urban expansion and infrastructure development. The land tenure system is helpful in saving land from degradation, but at the same time, it requires the proper management and planning for land use and land-use change. In the case of the lack of planning and management, the productivity of the land can easily be lost, even land handled by a private owner.

A thorough review of the literature reveals that land-use change is generally accepted to cause land degradation, and therefore, in this study, a general preposition to be tested is that "*together with the negative effect of intergenerational land distribution and land transfer rights, land-use conflicts have positive effects on land degradation*". For the preposition, the hypothesis is "*because of improper management and lack of planning, land-use change conflicts together with the land distribution cause land degradation*".

The theory of property rights in case of conflicts deals with the incentives of actors in their actions in the way that they confront each other in the struggle related to land (Alston et al. 1999: 171). In the model of Alston et al. (1999), actors are considered to behave in a strategic manner for the selection of land supply. This pattern is based on game theory and uses the rules of antagonist motivation. They have derived this model for the Brazil Amazon region.

The aim of all the actors is to win the ownership of the land, and violent conflict is defined as personal injury or death and/or physical damage of the property (land) under dispute. A conflict arises from the encroachment of squatters and efforts to expel the owner, which is legally supported by Brazilian law12 (Alston et al. 1999: 165).

The first important variable is the land value, as explained in Table 3.3 (ibid: 171).

If land owners are successful in attaining their rights and evict shareholders from their land, then the value of the land for them will be at a maximum, and the shareholders will not receive any shares. The second outcome is in favor of shareholders, and here, the land owners are deprived and receive compensation prices lower than the market share, as $0< \gamma <1$. For these two outcomes, there is no conflict, as there is no ambiguity (Alston 1999: 172).

The third outcome is an unsolved case in which shareholders are neither evicted nor expropriated. Land owners want the maximum land back, and so they are in favor of the first option. Shareholders want to attain higher benefits, and so they prefer the second option. Both the land owners and the shareholders try to obtain a maximum. This stage can be prolonged for years until the conflict is resolved, because of a variety of reasons, which are sometimes external factors, such as the inefficiency of the relevant departments (registration and revenue), or some unsolved issues of both the actors involved directly in the conflict (Alston 1999: 172).

Table 3.3: Land Values under Different Outcomes

Outcomes	**Land value to Shareholder**	**Land value to Land owners**
Land owners successfully evict shareholder	0	L
Shareholders successfully expropriate land owners	L	γL
No result	ΠL	δL

Source: Adopted from Alston et al. (2000: 172)

In the case of the distribution of the property of the deceased among heirs, if we consider the rule of distribution or no distribution of land, the above theory can be explained in different

[12] Constitution of year 1988, Article 196

ways. If land is not distributed between legal inheritors, then a conflict will arise, and if land is distributed but not transferred, then there may or may not be a conflict. These conflicts will cause degradation on the basis of land use. If the land is distributed and transferred, then again, there may or may not be conflict.

All these cases are explained in Table 3.4. The first situation is one of power asymmetry, where land shareholder 1 is stronger than the others and obtains a decision to his liking of not to distribute the land. His share of the land is in the form of whole land as 'L'. Shareholder 2 receives no land in this case. All control of the land is in the hands of shareholder 1. Conflict is possible as a result of this distribution. The second possibility is that the land is distributed, and both shareholders get their shares. In this situation, two further outcomes can be expected; there may or may not be conflict. In the case of no conflict, shares are given according to the law, and both shareholders are satisfied with their shares 'L' and 'γL', respectively. In the case of conflict, shares are not distributed according to the rules, and one shareholder is deprived of his actual share and is allotted less land. If shareholder 1 obtains a smaller share of the land, then $\gamma > 1$, or, in case of $\gamma < 1$, shareholder 2 is deprived. The third situation also has two outcomes. In this situation, the land might be distributed but not transferred to the actual owners. No conflict arises if all the shareholders are willing to live together and want to keep their land combined. In the second case, if the shareholders want to use their land on their own, then passive conflict might occur.

In this theory, the important variable is the conflict between the shareholders and the cases will be defined in Table 3.4.

Table 3.4: Land Conflicts under Different Outcomes

	Shareholder 2 gets his share from land	**Shareholder 1 gets his share from land**	**Result**
No land distribution	0	L	Conflict
Land distributed and transferred	L	γL	May or may not be conflict
Land distributed but not transferred	ΠL	δL	May or may not be conflict

Source: Own Presentation

Together with land distribution, land-use change lies at the base of conflicts and land degradation. Hence, conflicts on the basis of land-use change are another important variable in this theory.

The relation between land degradation LD and property rights is dependent on three different variables: land being distributed between shareholders denoted by Ldis, land being transferred between shareholders and other persons 'LT', and land distribution conflicts arising between shareholders 'Cdis'.

The first step explains the effects of property rights on the land degradation. For this purpose, the study will use three variables, viz., land distribution, land transfer, and conflicts attributable to land distribution, as independent variables and will regress all of them to land degradation as in Equation 3.1.

$$L_D = f(L_{dis}, L_T, C_{dis}) \tag{3.1}$$

To establish the hypothesis, a negative trend of these two 'Ldis' and 'LT' and a positive impact of the third 'Cdis' are required. These trends will explain the theoretical concept of increasing land degradation because of the improper implementation of land property rights of land distribution. If these laws are not appropriately executed, more conflicts will be generated and cause the occurrence of more degraded land.

In the case of land-use change, the efficiency of the different available options will be calculated in this study, as will the effect of different conflicts related to land use on land degradation on order to establish the second hypothesis. For the effect of land-use conflicts on land degradation, another regression is presented in Equation 3.2.

$$L_D = f(C_{LUC}) \tag{3.2}$$

$$L_D = f(C_{use\ 1}, C_{use\ 2}) \tag{3.3}$$

$$L_D = f(C_{dis}, C_{LUC}) \tag{3.4}$$

In this Equation, the 'positive' value of CLUC will establish that, with an increase in land-use conflicts, land degradation will also increase, whereas Cuse1 and Cuse2 indicate the response of respondent 1 and respondent 2 with regard to whether they will avail themselves of the option of land-use change or not. The positive signs of all these variables indicate that they all affect land degradation. The positive trend of these two variables supports the positive relationship between the land degradation and land-use conflicts. The last equation, Equation

3.3, will establish the second hypothesis, as inappropriate land distribution and improper decisions for land use will cause land degradation.

3.7 Summary and Conclusion

Institutions and property rights affect the functioning of land and cause land degradation. In order to analyze such a situation in a particular region, three theories have been proposed and explained in this chapter: distributional theory of institutional change, the theory of property regime, and property right theory in case of conflicts. The framework has been built on the Institutions of Sustainability framework proposed by Hagedorn et al. (2002). In this framework, on the basis of the characteristics of the land and actors, some situations are created in the action arena, and as a result, some outputs are obtained as conflicts, which can be tested for the reason of land degradation.

On a theoretical analysis, this establishes that private land is more efficient with regard to ownership than any other type of ownership of land, and that land-use rights play an important role in the degradation of land. Similarly, distribution theory of institutional change is in favor of the distribution of land but is based on bargaining and some high costs. This theory concludes that if one party has a source of income other than the land, the members of that party are in a better position for bargaining and are the risk takers. They can set their own time preferences according to their resources and income. Because of the heir asymmetric power, they have a strong influence on the decisions regarding land distributions, causing land-use conflicts.

The property right theory applied to conflicts explains the situation of land degradation attribuTable to the land distribution and land-use conflicts. There are increased chances of land degradation because of land distribution resulting in family conflicts and land-use conflicts. To the best of my knowledge, no work has been done at the level of family conflicts with regard to land distribution and land-use change causing land degradation. This study will provide information to fill this gap by collecting data from the selected regions.

4 Methodology and Descriptive Case Study Analysis

4.1 Introduction

For the analysis of the relationship between land degradation and property rights, a case study approach was followed, and the case regions were selected through published documents of the monthly statistical bulletin of Pakistan, February 2008, and the soil survey of Institute of Soil Fertility, Lahore. Three main regions were selected with different levels of land degradation among the twenty one villages (seven villages in each region). These villages were randomly selected on the basis of their distance from the grand trunk road and link roads among the large cities. Later, one village had to be eliminated from the study because of a disturbed law-and-order situation attribuTable to one family conflict regarding land distribution. Data for three main variables, viz., (1) intergenerational land distributional conflicts, (2) conflicts regarding land transfer to the actual landowners, and (3) land-use change conflicts, for the empirical investigation of land degradation was collected from these three regions. The field study was conducted over a period of three months, and during the selection of regions and villages, officials and experts in various research institutes and government offices were also visited for the collection of documents related to the study. Once the problems of the areas had been explored, detailed interviews of the landowners were conducted. For this investigation, a case study approach was followed, and after group discussions, a household survey was conducted for one hundred and fifty households, which were selected through stratified random sampling. Each stratum was designated as affected land because of degradation.

This chapter is arranged as follows: First, I link the theory discussed in the previous chapter to the empirical data as a research strategy in Section 4.2. In Section 4.3, I explain why I have used a case study approach for this study, and research process and its different stages are explained in the next Section 4.4. The various sources of data collection are given in Section 4.5, and triangulation is explained in Section 4.6. The background of the case study site is given in Section 4.7, and procedures for the selection of cases and villages are detailed in Section 4.8. Section 4.9 interprets the descriptive analysis of the cases, and Section 4.10 explains the selection of variables for the study. Finally, a brief summary of the Chapter is given in Section 4.11.

4.2 Research Strategy

Increasing scholarly interest in research can be utilized to explain various problems; research is a diverse phenomenon and cannot be restricted to a single pattern. Scholars have to approach problems in various ways, to set diverse questions for the collection of data, and to apply different theories to explore the solution to their problem; only then are they able to contribute to useful research. This linkage of data collection and theories for empirical analysis serves as a research strategy (Van de Ven 1992: 169, Bryman 2001: 8).

Before I present a further explanation of the research strategy used in this study, my intentions are to refer to some broad methods of reasoning, namely the deductive and inductive approach. Deductive thinking works from the general to the specific and starts from a general theory where we draw up our hypotheses. These hypotheses are to be tested during the research procedure, and then observations are collected to address the hypotheses, which may or may not be accepted. In case of the deductive approach, the researcher's views about theory are not final, and often he changes his views as the analysis proceeds, so that finally theories may or may not be confirmed (William 2006: 19, Bryman 2001: 9).

In the case of inductive thinking, the direction is the reverse, i.e., from specific observations to generalizations. From such specific observations, we can infer patterns, and on the bases of these patterns, some tentative hypotheses are formulated that can be explored. On the results of these hypotheses, a final conclusion or theory can be drawn up. Sometimes, data is not sufficient for the testing of hypotheses, and so researchers need to collect more observations. This is a back and forth procedure and is known as an iterative method (William 2006: 19, Bryman 2001: 10). Some researchers use both inductive and deductive approaches in their research (ibid). I have also used a combination of these two research approaches. The deductive approach departs from the general development of a preposition to establish principles in the study process, and inductive reasoning has been compared for different observed values between three regions.

Working with the theoretical prepositions, drawn up on the basis of the theoretical background described in previous chapter, it is necessary to make clear which empirical research approach will be used to answer the questions: qualitative or quantitative. For the study of institutions, the qualitative approach plays a large role (Furubotn and Richter 2005). According to Creswell (1997), qualitative research is a process of inquiry with the goal of

understanding a social or human problem from multiple perspectives; conducted in a natural setting with an objective of building a complex and holistic picture of the phenomenon of interest, qualitative research gives an in-depth understanding of human behavior, with close emphasis on people's words, actions, and records. These methodologies are designed to help the researcher with the perspective of target audience members through immersion in a culture or situation and direct interaction with the people under study. According to this technique, theories should be produced from observations and should be generated by the inductive and deductive way of interpretation. Hypotheses are generated during data collection and analysis, and measurement tends to be subjective. In the qualitative paradigm, the researcher becomes the instrument of data collection, and results may vary greatly depending upon who conducts the research (Neumann 1997: 14, Miles and Huberman 1994: 5). Whereas a quantitative paradigm is measured through objective facts derived through theoretical conception and independent of the researcher, they are supposed to control for bias. The aim of this approach is to formulate a valid theory (Stake 1995: 37, Welman and Kurger 2001: 69). The discussion above makes it clear that the qualitative paradigm is based on basic prepositions, created from the theories as in the present study.

Proceeding from the above search strategies, further steps for investigation provide an action plan that include questions, prepositions, and units of analysis (the actual source of information) (Yin 2003: 21). This action plan helps the researcher to obtain empirical results, and in order to understand this action plan, it is important to build a conceptual framework that explains the relationship among the main aspects to be studied, e.g., theory, variables, and empirical findings (Miles and Huberman 1994: 18).

Table 4.1 illustrates the building of the conceptual framework for this study based on the relevant theories and hypothesis derived from these theoretical backgrounds and preliminary results that explain the scope of the study. In this investigation, two theories are applied: distributional theory of institutional change and the theory of institutional change in case of conflicts. One hypothesis from each theory is derived, and the test of this hypothesis provides some results to improve the understanding of the case, whereas the final findings might establish whether the new theory is acceptable or not.

Techniques for scientific research comprise diverse ways of collecting, analyzing, and interpreting data that might answer the research questions in an appropriate way, according to Bryman (2001: 29). The author explains five different research designs: (1) quasi

experimental design, (2) cross sectional or social survey design, (3) longitudinal design, (4) comparative design, and (5) case study design. Case study is considered more appropriate for the study of social and qualitative studies based on inductive and deductive reasoning, as this particular design deals with the complexity and nature of the questions (Stake 1995: 2).

Table 4.1: Building a Conceptual Framework

Theory	Hypothesis	Results
Distributional theory of institutional change	Intergenerational land distribution creates land degradation	Improper land distribution causes land degradation
Theory of institutional change in case of conflict	Conflicts on the base of land-use change together with land distribution cause land degradation	Mismanagement and lack of planning causes land degradation
		Interpretation

Source: Own Presentation

4.3 Case Study Design

Yin (1994: 2) defines the case study design as an empirical inquiry that explores a contemporary phenomenon within its real-life context when the boundaries between the phenomenon and context are not clearly apparent and in which multiple sources of evidence are used. It presents detailed information about a particular participant or small group of respondents, frequently including the accounts of the subjects themselves; in the form of qualitative descriptive research, the case study draws conclusions only about that participant or group and only in that specific context. Researchers are interested only in exploration and description, instead in the discovery of cause-effect relationships. The role of case studies has become more prominent as a tool in research within the social sciences, e.g., in poverty, unemployment, and community based problems (Gulsecen and Kubet 2006: 97, Grassel and Schirmer 2006: 217).

The design of case studies is very important because of the potential lack of robustness in this method. Yin (2003: 39) explains various designs for case studies; they can be single or multiple depending on the issue in the research questions. Single case study design is preferred where there are no other cases available for replication, e.g., the effects of the tsunami in Hawai 2010 can only be conducted by using single case study design. In such cases, the events are rare, and conclusions cannot be generalized, but this problem can be solved through "triangulating" to test the validity of the data by other sources. Single case study design can be of two types: (1) holistic, where the researcher deals with only one unit of analysis and (2) embedded, which has many subunits.

Similarly, multiple case study design is derived from the real life events that have numerous pieces of evidence through replication. This is a "comparative" study between separate case studies (Yin 2003: 49) based on the related topic. Replication occurs at two stages: (1) the literal replication stage, where cases are selected with similar results, (2) the theoretical replication stage, where cases are chosen to explore the confirmation or rejection of the pattern of the initial cases (Yin 1994: 46). This model helps in the development of the theory when all or most of the cases show the same results. This case study design has two approaches: (1) the holistic approach, where only one phenomenon is studied at large scale, and operational details cannot be investigated, (2) the embedded approach, in which the researcher can understand the event in detail and gain better results. Land degradation is a complex phenomenon and can easily be studied through embedded multiple case study design, and so I have adopted this research design and selected three different cases, tested the hypothesis drawn from the theories, and finally compared the results.

Yin (1994: 53) explains a protocol for case study research, in which he gives prime importance to the unit of analysis and case study questions. The unit of analysis is a major entity in a research study, e.g., individuals, groups, or events. In my study, the unit of analysis is the "household" affected by the land degradation because of intergenerational land distribution and the availing different options of land-use change. According to the Census Program of UK (2011: 4), a household is defined as the people living at a same address sharing a common household. In my study, people were living in the same house and shared the main common entrance. For the analysis of land degradation related to these issues, one hundred and fifty households were visited in three different regions.

Case study questions should be very clear and specific and are asked during the field survey. Most of these questions are open-ended and focused on 'how' and 'why' for the qualitative analysis; for quantitative analysis, questions are based on 'how much'.

The data was collected in twenty villages from three main regions near Gujranwala and Lahore (Shaikhupura-Kamoke region, Qadirabad Dam region, Nandipur Region). These regions were selected for the analysis of land degradation.

4.4 Field Research Process

According to Lincoln & Guba (1985: 319), public records are materials kept for attesting to an event or providing some required information about a particular phenomenon. These records are collected from the areas in which the evaluation is taking place. Study of this information is not common but is potentially useful. In this study, for the selection of study regions, some reports and maps of the soil survey of the Soil Fertility Institute, Lahore and the monthly statistical bulletin of Pakistan February 2008, published by Federal Bureau of Statistics (FBS) Islamabad were used. With the help of these maps and reports, three areas were pin-pointed in the north east of Punjab, with different scales of land degradation. A further twenty villages among these three areas were selected randomly according to the requirement of the study. The major indicator for the selection of the villages was their distance from the main road.

Table 4.2: Check List for Field Survey Process

Steps in field survey	
Study of demographic survey for region selection	X
Visit experts in regional and district offices and law chambers for discussion and material collection	X
Interviews of relevant experts at regional level	X
Group discussion with villagers in selected villages	X
Interviews at household level	X
Interviews from interest groups	X

Source: Own presentation

Interviews with some experts in regional and district government offices and law chambers were also conducted during this time, and relevant material was collected, which was very helpful in the household survey. In Table 4.2, a list is provided showing all steps of the field survey. For further detailed information about the land degradation in the area, I used the expert opinions of the Agriculture Research Center Kalashahkako near Gujranwala together with the additional help of the District Office of Environmental Protection in Gujranwala and the District Office for City Planning, Gujranwala and tried to determine the major causes of land degradation in the region. I also visited some law chambers in the District Court of Gujranwala and the High Court of Lahore for the discussion of the issues related to my research. Finally, information was gathered from various sources, mainly through three open-ended questionnaires: questions in two questionnaires were asked from relevant experts and questions in the third questionnaire were asked from the affected households.

4.5 Data Collection

As previously explained, qualitative data is extremely varied in nature and cannot easily be recorded numerically because information is mostly based on textual data and in the form of a story (Auerbach and Silverstein 2003: 24). Different sources can be used for the collection of qualitative data, e.g., participant observation, behavior personally observed by a researcher, experts' opinion, cultural artifacts, documentation, media accounts, and general discussions with people in the area individually or as a group. In my study, three different methods were used to investigate and collect the information.

4.5.1 General Group Discussion

During the first step, I visited the different villages and met most of the villagers at an open place with the reference to a senior person or a representative of the people to discuss the problems related to my study. This person was, in some places, the nazim[13] (mayor) of the Union council[14] or the landlord of the village, and in some villages; he was the Imam of the local mosque. This meeting was approximately of three to four hours in duration. On the basis of information provided during this meeting, strata were derived for the stratified sampling for

[13] Nazim is the representative of local people in a local body administration
[14] Union council is the smallest division in local body administration and will explain in fifth chapter in detail

household selection. These strata were defined on the basis of land quality. Then, some affected households were marked according to the size of the total affected houses in the village (about one third of effected households per village), and next day, these houses were visited individually. During this visit, the two persons from one household were interviewed. A person, who was culturally in the powerful position, acting on behalf of the head, was my first respondent (R_1). Second respondent (R_2) was the other member of that household, who was deprived and did not get his right.

4.5.2 Interviews with Landowners

Words spoken by people represent data in cases of inquiry, and the interview is the major source of data collection and is the most difficult with respect to obtaining the right response. Mischler (1986: 11) explains an interview as a joint product of interviewee and interviewer talking together, and the way in which they talk to each other. The use of interviews as a data collection method begins with the assumption that the perspectives of the participants are meaningful and knowable, and it is assumed that their views will contribute to the success of the project. An interview is not only a paper and pencil survey but is important in the case of interpersonal contact, and if opportunities for the follow-up of interesting comments are desired.

Two types of interviews are used in evaluation for qualitative research. The first is the semi-structured interview, in which the researcher has a theme to be covered through a questionnaire. Although a questionnaire has previously been administered, some questions have to be omitted according to the situation of the interview and a particular topic. The second type is the in-depth interview, in which there are no hard and fast rules for the interviewers and no rigid forms; indeed, the interviewer seeks to encourage free and open responses, and there may be a trade-off between the comprehensive coverage of topics and an in-depth exploration of a more limited set of questions. In-depth interviews also encourage the capturing of respondents' perceptions in their own words, a very desirable strategy in qualitative data collection. This allows the evaluator to present the meaningfulness of the experience from the respondent's perspective. In-depth interviews are conducted with individuals or with a small group[15] of individuals, permit personal interaction with the

[15] Small group of individuals about 10 to 12 is known as focus group.

respondents, and provide an opportunity to explore topics in depth. It also allows the interviewer to explain or help clarify questions to increase the usefulness and effectiveness of responses and to be flexible in undertaking an interview with particular individuals or circumstances.

Among these visited household from the selected regions, an interview was conducted with two members, who were legal shareholders in the property of the predecessor. One interviewee was the caretaker of the estate, according to the culture of the family, and the second respondent was a member of the family, who had suffered because of anomalies of the law or culture. Questions were semi-structured and in the local language, and interviews were recorded and noted down with the permission of the respondents. These interview guidelines were flexible, as Bryman (2001: 323) maintains that questionnaires help a researcher with respect to the flow of the questions, but sometimes the order can be altered according to the situation of the interview. Similarly, they are helpful in defining topics, the behavior of the people, and clarifying the problem, although specifications of the interview questions cause some problems. Flexibility of guidelines is necessary in the case of audio recording of the interviews. Interview guidelines are explained in Table 4.3.

Table 4.3: Interview Guidelines for Landowners

1. Personal data of landowner
2. Ownership of land
3. Land history
4. Distribution and transfer of land
5. Conflicts among family about land distribution and land transfer
6. Land sale or purchase
7. Structure of land and land degradation
8. Land-use change
9. Land-use change conflicts

Source: Own Presentation

The place in which interviews were to be conducted was chosen by the interviewees. Mostly, it was a guest room at their workplace and within a friendly environment to allow the interviewees to feel that they were not forced to relate anything that they wished to keep private. Briefly, I told them about my requirements with regard to their ownership rights and land-use rights, and then they were free to tell anything that they wanted. If the respondent was not willing to reply to a question, I skipped over that question. I tried to probe them in a very friendly way, and if I felt that they were not willing, I did not force them to answer.

Figure 4.1: One Respondent in the Village Nowykay during His Lunch Break

4.5.3 Interviews with Experts

In case of experts, my target interviewees were local and district level officials related to land distribution and the land registration department, called patwari, and lawyers from the notary public and Registrar. A patwari is the most junior official of the revenue department; he deals at a village level and generally is an employee of grade 5. He is the sole custodian of all the original land records of the particular area, which is composed of two to eight revenue estates (commonly one large village or two to three small villages). He is also responsible for keeping the records of government land in his area. A patwari has authority to keep original records

and can make changes relating ownership, use and taxation in these records in case of change (Qazi 2006: 5). For my study, I visited ten patwaries, in three regions (twenty villages), and asked some questions related to my research (Table 4.4).

Table 4.4: Questionnaire for Patwaries

1. Personal information
2. What are land distribution laws implemented in this region?
3. What are your responsibilities in the case of land distribution and land transfer?
4. Generally what kind of problems do you face in the transfer of land?
5. What is your role in the case of the issue of power of attorney?
6. What types of documents do people need from you?
7. What is your role in the case of the sale or purchase of land?
8. What sort of conflicts generally do you find in the region related to land?
9. Do these conflicts also cause land degradation?
10. What policy will help to solve the problem of land degradation in the region?

Source: Own Presentation

Similarly, lawyers from the notary public and registrar (sub registrar) are the government officials appointed at the district level as an issuing authority of power of attorneys. Lawyers from the notary public are responsible for the issuing of the special power of attorney[16], and the registrar (sub registrar) is responsible for the general power of attorney.[17] The registrar (sub registrar) is basically the member of the district revenue office, called the thesildar (naibthesildar) of grade 16 (15) and is the man in charge of the office in one district.[18] The main responsibility of thesildar is the collection of land revenue, payable to government, and in order to fulfill his responsibilities, he has to keep his information about land and land records up to date. Because of his responsibilities, he is an assistant collector of class I, and his assistant (naib thesildal) is an officer of class II with similar responsibilities. In the case of

[16] Special power of attorney will be explained in detail in Chapter five.
[17] General power of attorney will also be explained in detail in Chapter five.
[18] Administrative unit of district division and will be explain in Chapter five.

general power of attorneys, the government appoints them as a registrar (sub registrar). For my study, I visited three lawyers and three registrars (one lawyer and one registrar in Shaikhupura, and two lawyers and two registrars in Gujranwala), and asked them questions related to my studies (Table 4.5).

Table 4.5: Questionnaire for Lawyers and Registrar

1. Personal information
2. What is your role in the case of the issue of power of attorney?
3. What types of documents, people need for this contract?
4. What are your responsibilities in the case of monitoring this power?
5. Generally what are the reasons for the cancellation of this contract?
6. Do you find some serious conflicts because of the cancellation of these contracts?
7. What sort of conflicts generally do you find in the region related to this issue?
8. How are these resolved?
9. Do these conflicts also cause land degradation?
10. What policy will help to solve the problem of land degradation in the region?

Source: Own Presentation

4.6 Triangulation

In case study data collection, the accuracy, validity, and reliability of the data are most important, and for this purpose, Yin (1994: 80) has suggested various sources for the collection of data. This process is known as triangulation, through which collected data can easily be verified by another source (Yin 1994: 92, Stake 1995: 114). For my present study, I have used various techniques for the confirmation of my data and to obtain accurate information.

4.6.1 Personal Observations

Personal observation techniques are helpful for individuals to gather first-hand data on the behaviors of the respondents being studied. It is based on a natural and flexible setting, and

the personal involvement of a researcher is the major element in these observations (National Science Foundation (NSF) 1993: 52). Normally, there are contradictions in beliefs and in what people report in interviews, and personal observations are the best tools to check against these discrepancies; this is helpful for understanding the multiple diverse perspectives of a community. To attain this objective, a researcher has to approach the respondent, rather to call them into his environment (Family Health International (FHI) 2005: 13).

In this study, I was fully involved in the field survey and gave full attention to every respondent and his actions. During the general meeting, I interacted with all affected household heads. Next day, during individual meetings with selected households, I keenly observed the actions that occurred but kept in mind the many small things related to my research and noted down some things in my dairy. This provided me with an opportunity to collect data on a wide range of behaviors, to capture a great variety of interactions, and to explore the evaluation topic. This approach also allowed me to learn about things that the participants or staff might have been unaware of, or that they were unwilling or unable to discuss in an interview or group discussion. It also provided me with good opportunities for identifying unanticipated outcomes and permitted me to enter and understand the situation.

4.6.2 Document Studies

Another technique of data collection, which is not very common but potentially useful, is document studies; written material and documented records from different organizations and publications can also produce information for the cross-checking of the collected data (Patton 1990: 4). According to Yin (1994: 80), documents are the most reliable source for the validity of data because of repeated reviews and the large time span for the data collection.

For my study, I collected material related to land degradation from the libraries of various research institutes, e.g., the Rice Producing Research Center Kalashahkako, Soil Fertility Research Center Lahore, Soil Research Center Lahore, and Agricultural Research Centers in Lahore, Gujranwala and Islamabad. For further exploration of some issues related to land-use change and city expansion, I visited the city planning office Gujranwala, industrial development office Gujranwala, and housing societies Gujranwala, the Lahore Development Authority (LDA), Ministry of Environmental Protection Lahore, Motor Way Construction Authority Lahore, Motor Way Planning Lahore, and Motor Way Planning Islamabad. These public records helped me to understand the institutional structure and government policies for

land use and for environment and agriculture protection. Some information was also gathered by the revenue office, Gujranwala, for the structure of local governance and the present laws of registration for the cross-checking of the information gathered from the respondents. All these documents were easily available and were inexpensive. They were local in setting and in the language in which they occurred and were useful for determining value, interest, political climate, and public attitudes.

4.6.3 Photographs

Photographs are also a very useful tool for data collection, as introduced by Wagner (1979), and many researchers have successfully employed this technique for analysis in the field of social sciences. I have used this technique for the verification of my information. I took various photographs from the different places in the field regions with the permission of the landowners and according to the situation of the event.

4.6.4 Informal Interviews with other Actors

Various techniques were used to collect and to verify the data. The main focus was on the local land owner and farmers, but also some other villagers who were not farmers but essential part of the villages such as Imam Masjid, the women who cook bread for the villagers, shoe makers, etc. were questioned. Similarly, some other actors such as real estate builders and industrialists were also visited and asked about their interest in the area with respect to the sale and land-use change pattern of the region.

4.7 Background of the Region

All of three case study regions were selected from the north east area of the province Punjab[19], called Retina Doab[20] (shown in Figure 4.1). The regions are located in the upper area of the doab shown near Upper Chanab canal.

[19] Punjab is province in Pakistan with the largest Population.
[20] According to Earth Science, the alluvial land between two converging rivers is known as a doab

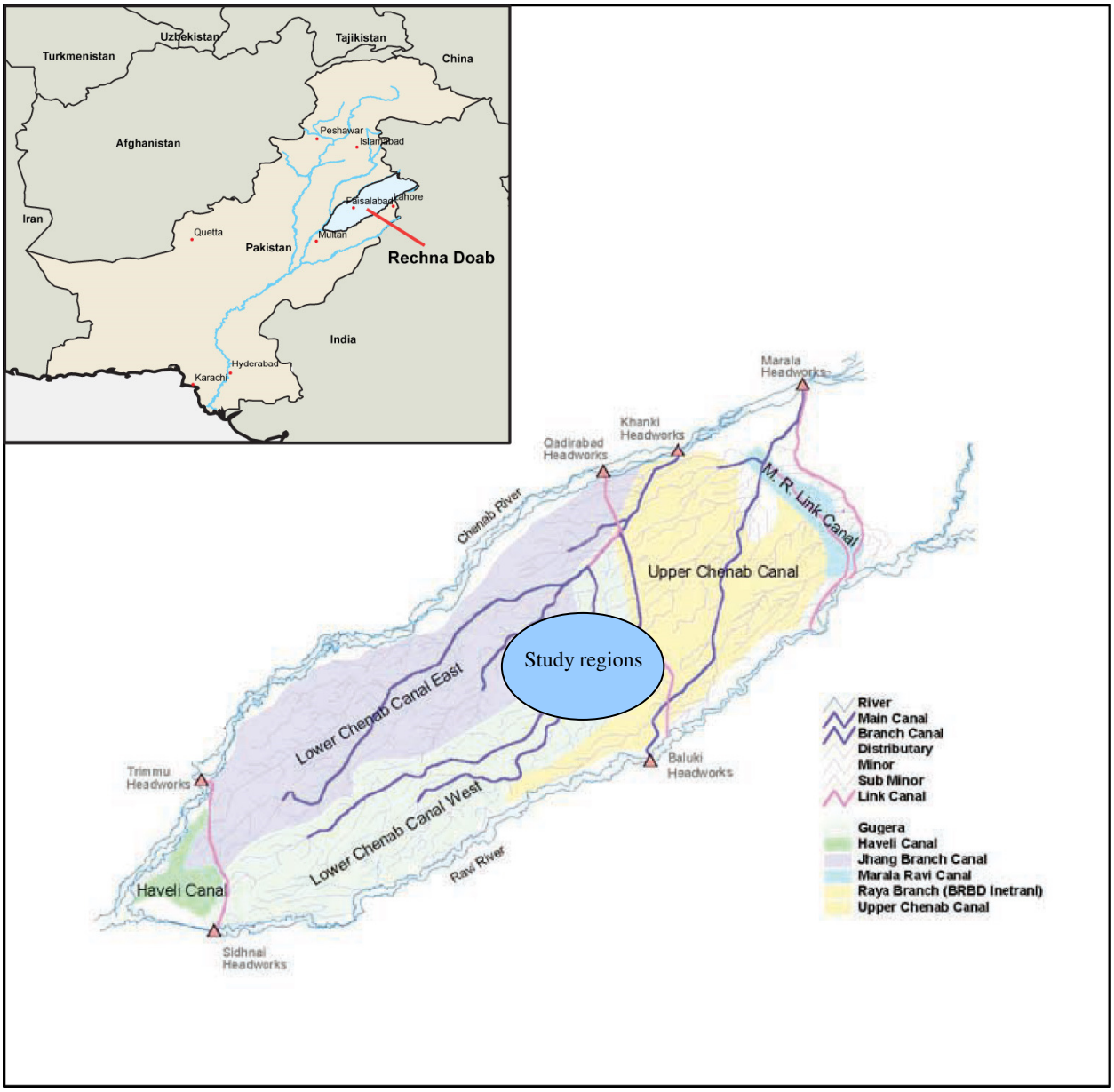

Figure 4.2: Rechna Doab Benchmark Basin, Pakistan
Source: International Water Management Institute (2001)

This doab is situated between the two rivers, Ravi and Chanab, and the agricultural point of view is very important because the doab is irrigated by the canal links from these rivers and also from other rivers. The soil of this doab is very fertile and good for the production of cash crops, for example, wheat, cotton, sugarcane, and rice (Jhangir and Ali 1997: 1). The north east part of this doab, which is geographically located at 31^{o} in North and 73^{o} in east, is very famous for its cultivation of rice, because rice favors a fine soil texture with maximum water

retention near the root zone. According to the history of Rechna Doab, this area is considered best for the availability of irrigated water and ground water (ibid: 23).

District Shaikhupura, Gujranwala, and Sialkot are much enriched in the production of the World's best quality rice known as “Basmati”, which has a special aroma, and Pakistan has a monopoly in the International Market because of this aromatic verity of rice (Jhangir and Ali 1997: 23). Jhangir and Ali (1997: 31) and Jhangir et al. (2003: 11) report that the farmers only use ground water for the rice cultivation in the clay soil, because, in this region, the ground water is of good quality and, in the case of the use of irrigated water from the canal, the cost of production increases. The history of Rechna Doab shows that this area has not been properly utilized, as some of the areas have been over-cultivated as mentioned in the study of Jhangir and Ali (1997: 3-31); land was intensively used in the upper Rechena Doab. This use was about eighty one percent in 1960, increased gradually up to the level of ninety three percent in 1990, and again reduced to a level of eighty six percent in 1995. Increase in output level occurred because of the introduction of higher yields and new varieties and additional water supplies. After 1990, a reduction in output was caused by many reasons, for example, a cut in subsidy for fertilizers, a shortage in the labor supply because of poverty and urban migration, and the land degradation because of over-cultivation and mismanagement in the land-use change (Jhangir and Ali 1997: 23, Rehman et al. 1997: 15, International Water Management Institute (IWMI) 2007: 3).

4.8 Selection of Case Studies Sites

As previously explained, three study regions were selected with the help of published data of the Monthly Statistical Bulletin February 2008 and Soil Fertility Report; the main indicator was the level of degradation of land. According to the study of the Soil Fertility Research Institute Lahore, the upper part of Rechna Doab can be divided into three groups on the basis of land capability classification.

This classification is a method of the general grouping of areas as per characteristics of soil for agriculture production. This classification is as follows: (1) moderate agricultural land with a moderate level of degradation that can be reclaimed, although the cost is high, (2) poor agricultural land with a high level of land degradation that is non-reclaimable, and (3) good agricultural land with a low level of degradation that is easily reclaimable. I selected one region from each classification, the major indicator being area of degraded land. These

regions were sub-divided into twenty villages: six villages from the first region (Shaikhpura-Kamoke Region- SKR) and seven villages from each of the other two regions (Qadirabad Dam Region- QR and Nandipur Region- NR, respectively).

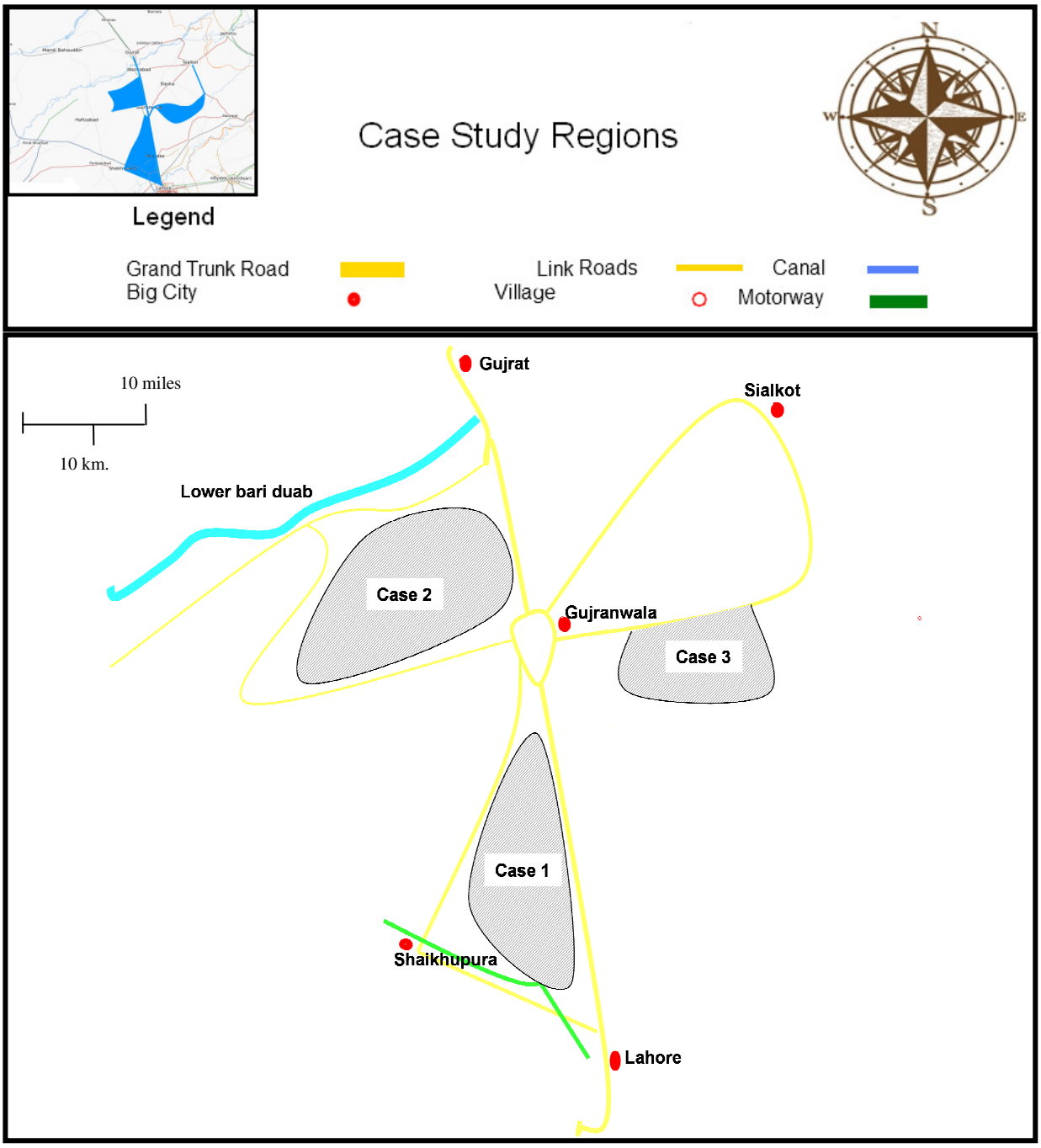

Figure 4.3: The three Case Study Regions

Source: Openstreetmap.org

In Figure 4.3, three large cities are prominent, for example, Lahore, which is the provincial capital and center of trade and commerce in Punjab province; similarly, Sialkot and Gujranwala are major industrial cites and the chances of employment are high in these cities. Because of these economic reasons, urbanization in these cites is growing very rapidly (Sharazi 2009: 2). This urban migration and population pressure have affected the rural areas in the surroundings, and many interest groups such as builders and industrialists are attracted into these selected study regions for their own non-agricultural interests. The villages were selected on the basis of their distance from the grand trunk road or link roads between main cites, as most villages chosen were near the roads as shown in Figure 4.2 for the analysis of land-use change effect on land degradation. Three main variables were considered for the analysis of land degradation according to my hypotheses: (1) intergenerational land distributional conflicts, (2) conflicts regarding land transfer to the actual landowners, and (3) land-use change conflicts. As previously mentioned, for this study, one hundred and fifty households were visited (fifty in each region), which were selected through stratified random sampling; strata were created on the base of effected land. People with more badly affected land were grouped into one stratum, whereas those with less badly affected land were placed in another group. From each group, one third of the total number of the households, affected with land degradation in the village, were selected randomly.

4.8.1 Case 1: Shaikhupura-Kamoke Region (SKR)

Land capability for this region has some moderate limitations for agricultural production throughout the year or some specific period of time, e.g., during the cultivation of specific crops. Normally, special techniques are required for remedial measures. Soils in this case have moderate to strong sodicity, which occurs because of the periodically high water Table in the region. Collection of alkali (sodium ion) in the root zone reduces the efficiency of the land, and the overall productivity of the land falls. Many reasons are possible for this degradation of land, such as the use of old methods of cultivation, poor management of the irrigation system, and lower availability of groundwater through tube wells because most landowners use groundwater for irrigation (Jhangir et al. 1997: 23), but because of the huge population pressure in large cities, the availability of water for agriculture is reduced (Couton 2009: 90).

The soil fertility report also mentions that these areas are reclaimable, but that the management cost is very high because of the drilling of new tube wells in the regions or the

requirements for improvements in the drainage system in the area to avoid seepage. This land can also be treated by applying gypsum onto the affected soil. The calcium remains in the root zone of the plant when gypsum ($CaSO_4$) is dissolved in water and splits into ions; the sodium ion attaches to the sulphate ion, dissolves in the water, and percolates down out of the soil.

As shown in Figure 4.4, this region is a triangle formed by the grand trunk (GT) road and link roads. The GT road links Lahore with Rawalpindi via Gujranwala, the first link road is between Shaikhupura and Gujranwala, and the second one links Shaikhupura to Lahore.
I visited six villages (Sahokimaliyan, Majuchack, Sadoke, Kamoke, Mustafaabad, and Dara Husainwala) in this region, which were selected randomly on the basis of their distance from the main roads from the large cities. In Figure 4.4, the location of these villages is highlighted. Mainly, these villages are situated on Lahore-Gujranwala GT road and Shekhupura-Lahore Road.

For the analysis of the effect of land-use change conflicts on land degradation, I visited fifty households in this region and tried to explore other reasons of land degradation according to my hypothesis.

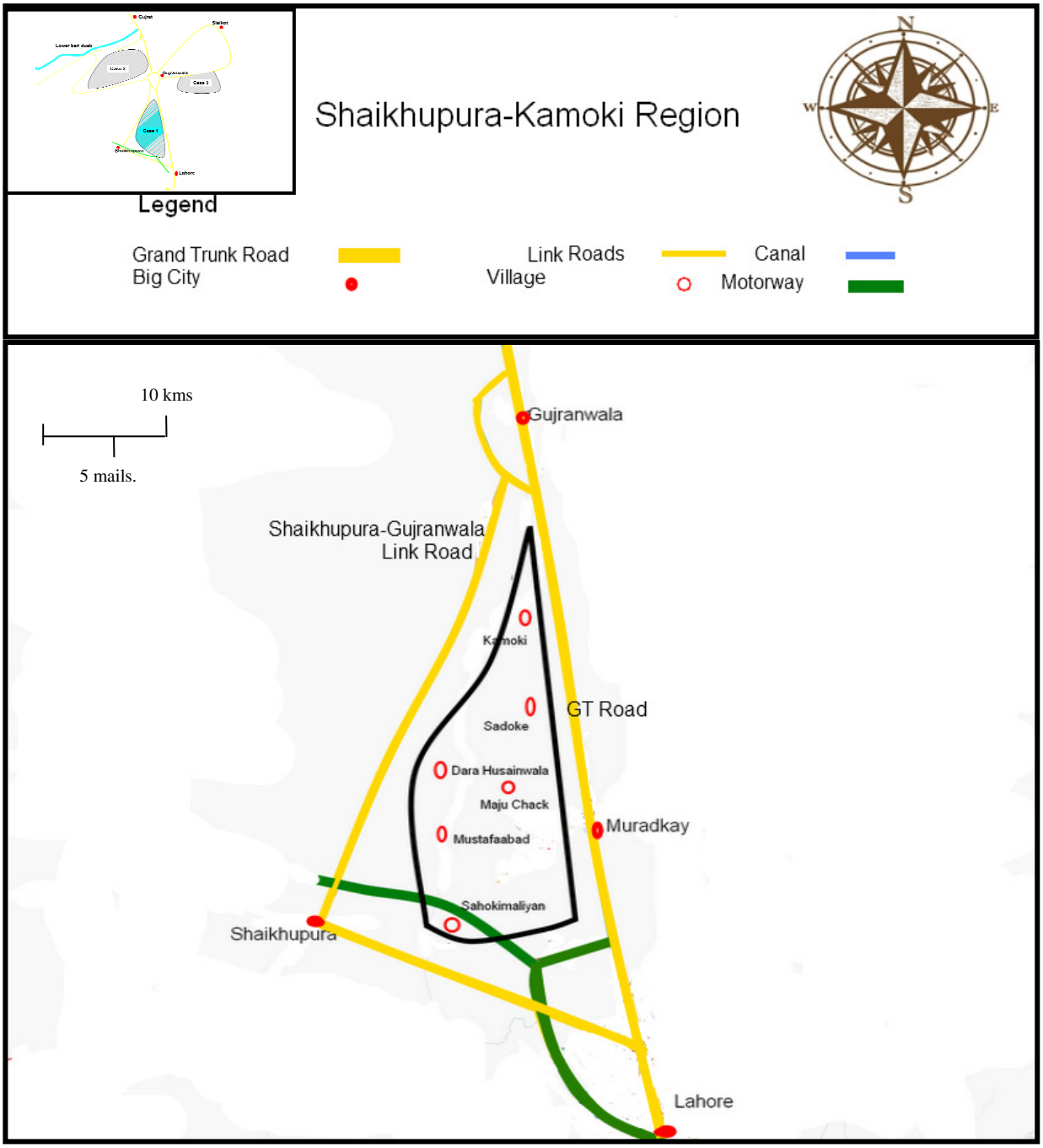

Figure 4.4: Shaikhupura-Kamoke Region
Source: Openstreetmap.org

4.8.2 Case 2: Qadirabad Dam Region (QR)

According to the land classification, this region is categorized as having both irrigated and dry farming conditions, with the soil having severe limitations for agriculture production and a narrow range for farming use. The cost for development and maintenance of these areas is very high and is technically high for high-level production with high-yielding crops and a large investment for irrigation. Thus, most of the land in this region is not cultivated for crop production. Dam seepage is one of the main reasons of land degradation in the region. With all these limitations for crop production, this area can be used for other types of farming, such as fish farming or dairy farming, and so in the report of soil fertility, areas like this are called poor (marginal) agricultural land. Eucalyptus plantations have been found to be very effective in some of the areas where the water Table is comparatively low and can be controlled. This land is used for the cultivation of wheat or fodder or low quality rice under tube well irrigation.

Figure 4.5 shows the location of the villages and indicates that a branch canal of the Upper Chanab Canal named the Lower Bari Canal passes very close to this region. This region is connected to Gujranwala and Gujrat (another large industrial city famous for its electricity industry) through with Lahore-Rawalpindi GT road and the Gujranwala bypass, and on the other side, the famous district Hafizabad, which is rich in rice cultivation, is also connected through a link road; all visited villages were near these main roads. Seven villages were visited in this case (Alipurchattah, Chanawa, Jamkaychattah, Jandyala, Siraanwali, Ademkeychattah, and Qadar-a-bad). Four of them were near the GT road, and the remaining three were near the Gujranwala bypass. Cultivated areas were found close to the city of Gujranwala. For the exploration of the problem, fifty households were visited, as in the previous case, and data was collected for the study.

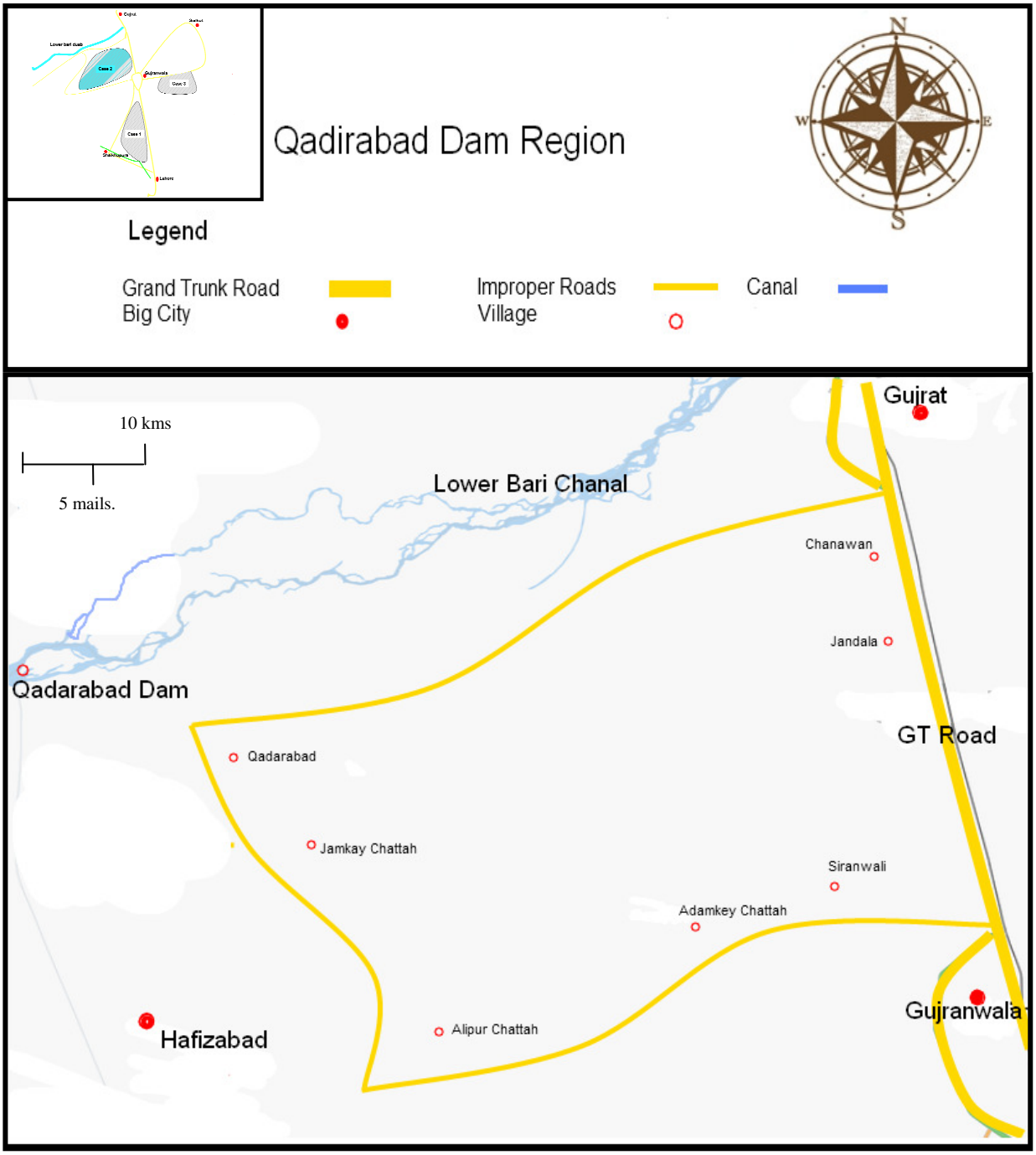

Figure 4.5: Qadirabad Dam Region
Source: Openstreetmap.org

4.8.3 Case 3: Nandipur Region (NR)

Soils in this class have minor limitations for crop production as remedial measures are easy to apply and can be managed with less effort as compared with the class of "moderate agricultural land". These areas can be affected by water logging in the rainy season because of poor management of the irrigation system. However, this problem is not permanent, and some extra care and attention in the preparation of seedbeds can resolve it, the only requirement being to train the local farmer in the proper management of his land. In this way, prime agricultural land for crop production can be saved. The land can become highly productive, and according to the soil fertility survey, this is good agricultural land with minor limitations for crop productions throughout the year, having the widest range of agricultural use with little heavy irrigation of good quality of water.

As in the previous two cases, this region is also situated between two large cities, Sialkot and Gujranwala (Figure 4.6), and as previously explained, these two cities are economically very important. This is the reason that the population burden in the soundings in very high. Geographically, this area is very important for the development of industries and for city expansion. I visited seven villages in this area (Nowkay, Dansarpai, Mahrwala, Banglay, Wandalay, Tharwali, and Nundipur Chack), near the Gujranwala-Sialkot road via Pasrur, as shown in Figure 4.5, and for my study, I also visited fifty households in this region.

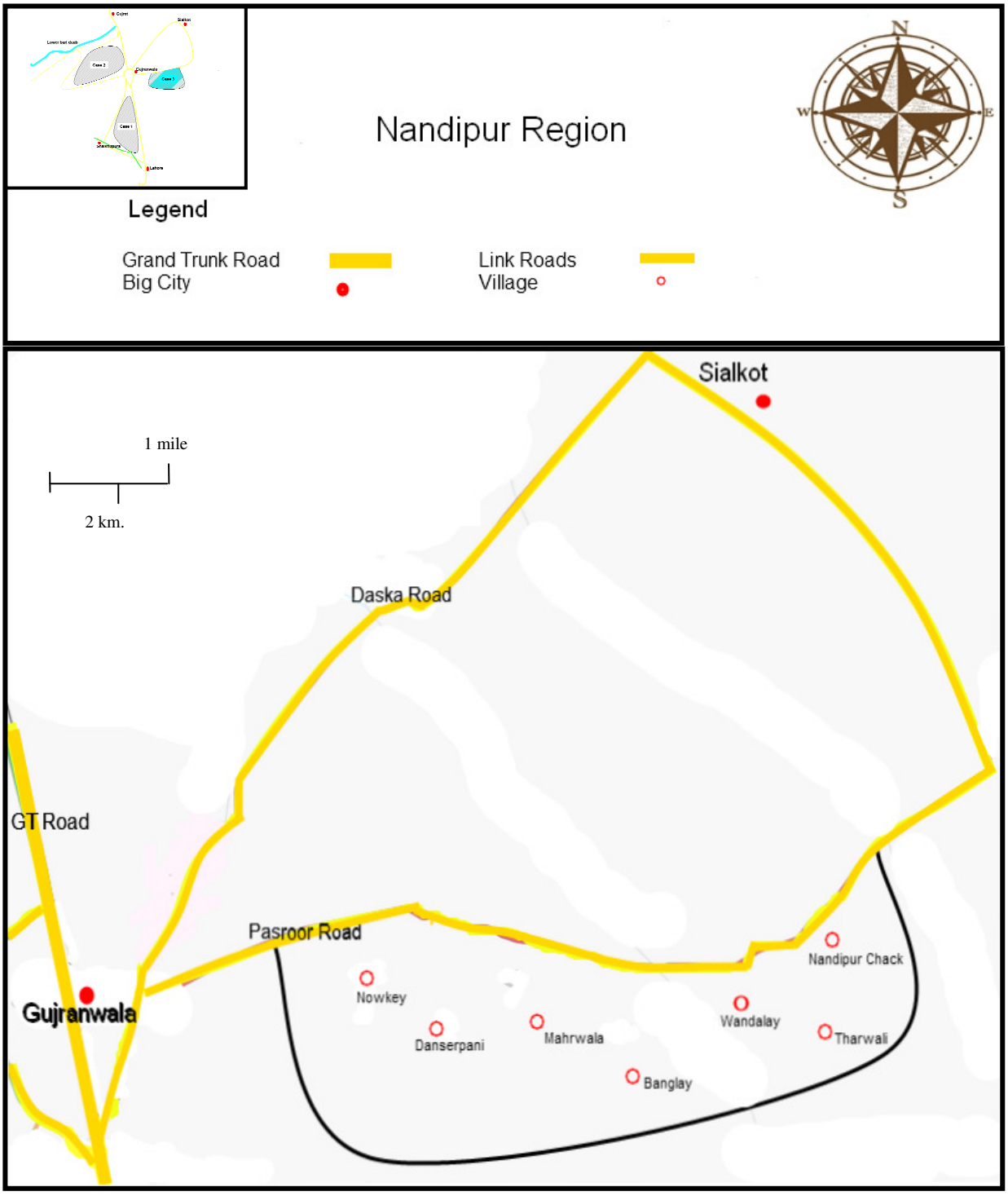

Figure 4.6: Nandipur Region
Source: Openstreetmap.org

4.9 Comparative descriptive case study analysis

In the following, the study regions will be indicated by the acronyms SKR (Shaikhupura-Kamoke Region), QR (Qadirabad Dam Region), and NR (Nandipur Region). Figure 4.7 shows that, in the case of SKR, the land is moderately degraded, and the survey results show that some of this area has been reclaimed by the landowners. For this purpose, they have used gypsum[21] on their land as recommended by Jhangir and Ali (1997: 76) for the solution of the land degradation by sodicity. As shown in Figure 4.3, the case of QR is situated very near to the Lower Bari canal, and because of this, the soil is rich in moisture, According to the soil fertility survey, it is hard to reclaim and is poor agricultural land. Survey data also show the same situation in the area depicted in Figure 4.6. For the third case NR, the soil fertility report says that this is highly productive area and quite good for agricultural production with less land degradation (see Figure 4.6).

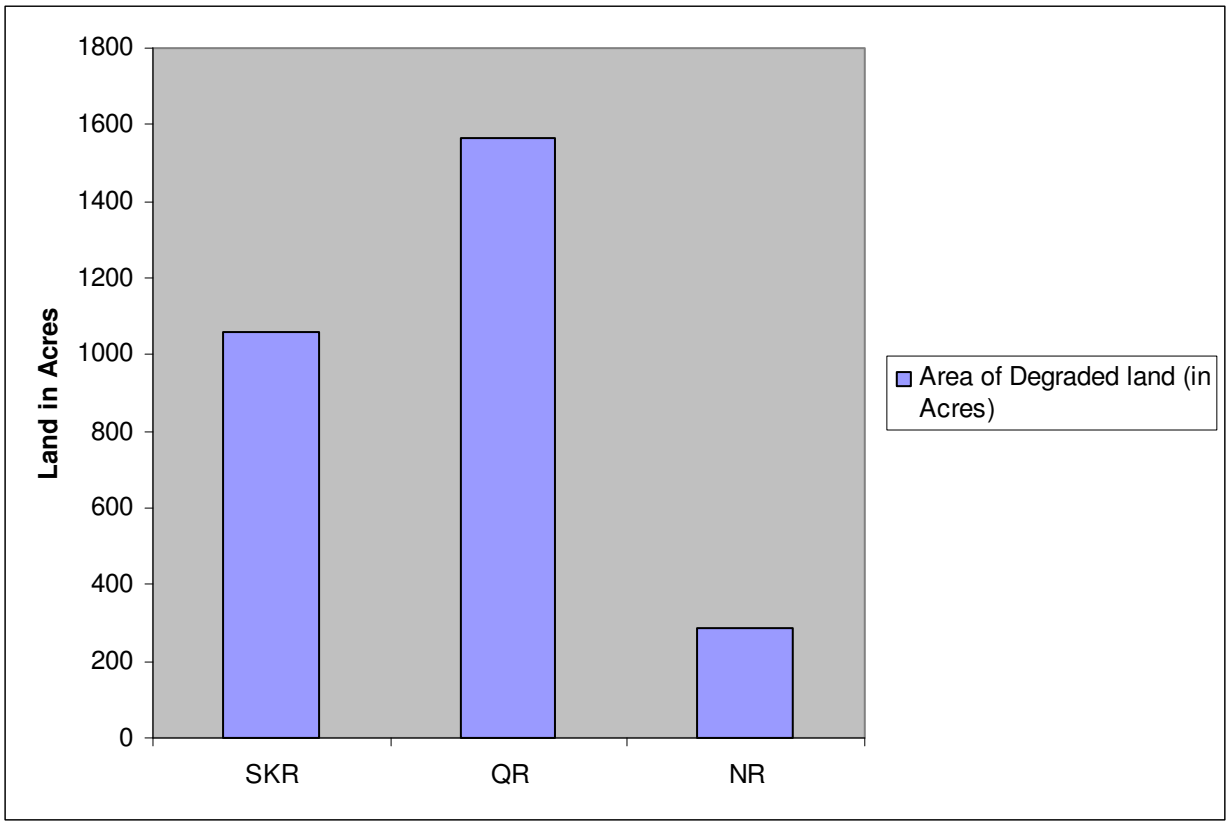

Figure 4.7: Area of Degraded Land in Three Selected Regions
Source: Own survey 2008

[21] Gypsum is used to rectify the deposits of sodium causing sodicity in land.

As mentioned in the literature, these three regions are not properly utilized for crop production. The soil fertility report mentions that Shaikhupura-Kamoke Region (SKR) can be used for general cropping under amended tube well water but gives moderate yields under traditional management. Nevertheless, with modern management, this land is capable of producing good yields for most of the crops. In the case of Qadirabad Dam Region (QR), modern management techniques and irrigation structure are helpful in the production of selected high-yielding crops of wheat and rice. In the case of Nandipur Region (NR), even under traditional management, a small amount of extra irrigation to leach the salts can give better results, and the land can produce very good yields of crops throughout the year. These situations have been observed by the researcher during the survey results reported in Table 4.6, although the production level is gradually becoming less than that of previous years, although the farmers were still trying to produce rice and wheat alternatively in these regions, as the Kharif[22] and the Rabi[23] crops.

Table 4.6: Comparative analysis of annual production of crops per Acre in the regions (2007-08)

Regions	Current Wheat production (kg per Acre)	Recent Rice Production (kg per Acre)
Shaikhupura-Kamoke Region (SKR)	1600	1700
Qadirabad Dam Region (QR)	1000	1000
Nandipur Region (NR)	2200	2400

Source: Own Survey 2008

A fall in production has mainly been reported because of the scarcity of water, industrially polluted ground water, and conflicts related to land distribution among heirs and land use. Landowners have reported various reasons for land degradation on the basis of the unequal intergenerational distribution of land, e.g., a person installed a tube well on his land and, at the time of the distribution of the land after his death, a powerful heir took that part of land and

[22] The term Kharif means autumn, and in Pakistan, the season for this crop usually starts from the first rain of monsoon in July.
[23] The term Rabi means spring, and the season is from October to February

kept the tube well in his custody, and was not willing to share water with other shareholders or particularly one whom I investigated. This loss of water causes salinity or sometimes sodicity. Similarly, some farmers report that, eventually, they will face serious issues such as crops on being set on fire by an opposing actor or group of actors, and that this crop burning has bad effects on the fertility of the soil.

4.10 Model Explanation

For an empirical analysis and find the relations between land distribution and land degradation, I used SPSS (Statistical Package for Social Sciences) to estimate the Ordinary Least Square regression model (OLS). Land degradation (LD) is explained as a dependent variable, and intergenerational land distribution conflicts (C_{dis}) and land-use change conflicts (C_{use}) are all interpreted as independent variables.

In the first step, I used two independent dummy variables, land distribution among heirs and land transfer, to test the hypothesis that intergenerational land distribution can cause land degradation, as mathematically explained in Equation 4.1.

$$LD = f(L_{dis}, L_T) \quad 4.1$$

Where 'L_{dis}' is the land distribution among heirs and 'L_T' denotes the land transfer. Values of these variables are the direct answers of the questions explained in Subsection 4.3.2. In the next step, the effect of land distribution was merged with the effect of conflicts occurring because of land distribution in order to find the joint effect all these three variables on land degradation (Equation 4.2). The variable of 'land distribution conflicts' (C_{dis}) was also confirmed from the previous two variables of land distribution and land transfer, as conflicts in the case of non-distribution, conflicts raised as oral transfer, and as a result of complete possession.

$$LD = f(L_{dis}, L_T, C_{dis}) \quad 4.2$$

For the attestation of the second hypothesis that land degradation is caused by intergenerational land distribution and land-use change, the relationship of two different

responses for land-use change (whether landowners were in favor of change or not) with land degradation was found by means of Equation 4.3.

$$LD = f(C_{use1}, C_{use2}) \qquad 4.3$$

Here 'C_{use1}' and 'C_{use2}' are the response to land use change of the landowners from the same house respectively as explained earlier in Subsections 4.5.1 and 4.5.2. These are also qualitative variables with two possible options of may or may not change the use of land. To check the effectiveness of the different land-use options, some more linear equations, e.g. equation 4.4, were estimated.

$$LD = f(X_i) \qquad 4.4$$

After finding the relationship between land-use options and land degradation, percentage response in land degradation with respect to the change in numbers of land users for one particular option was measured as the effectiveness of land use change. To check which option has the strongest effect for land degradation, the effectiveness was calculated through the Equation 4.5.

$$Effectiveness_{X_i} = \beta_{X_i}\left(\overline{X_i} \big/ \overline{LD}\right) \qquad 4.5$$

Where '$\overline{X_i}$' is initial value of different options of Land-use Change and '$\overline{LD}$'is the value of degraded land in Acer before going for this land-use change, 'β_{X_i}' is the rate of change of land degradation with respect to change in the value of X_i. Finally the effect of conflicts, occurring because of land distribution and land-use change, on land degradation was estimated through Equation 4.6, for the confirmation of the second preposition of the study, as inappropriate land distribution and improper decisions for land-use will cause land degradation.

$$LD = f(C_{dis}, C_{LUC}) \qquad 4.6$$

Here 'C_{LUC}' is the conflicts based on land use change.

4.11 Summary

This chapter has briefly presented the research strategy and case study design and explained the ways of linking the theories to our findings. Three regions were selected for an in-depth study and for the analysis of property rights and land degradation, and through stratified sampling, twenty villages were selected. This selection was dependent on the soil condition of the villages. The units of analysis (households) were chosen randomly following group discussion with the villagers.

The case study method was followed for the analysis of the problem. Data were collected through semi-structured interviews from the actors (landowners, patwaries, registrars, and lawyers) and were confirmed by various techniques, e.g., personal observations, document studies, and photographs. Some other actors such as real estate builders and industrialist were also investigated informally for the authenticity of the data.

The ordinary least square method was used for the estimation of results, from the collected data, to establish the hypotheses. Different relationships between land distribution conflicts were employed for the confirmation of results. Similarly, for the analysis of effects of land-use change, the efficiency of all available options for land degradation was utilized as an additional step, together with the estimation of the relationship between conflicts (as a reason of land distribution and land-use change conflicts) and land degradation.

5 Empirical Setting - Land Administration and Legislations with Local Governance Structure

5.1 Introduction

The land administration system and land reforms in the Subcontinent Indo-Pak[24] are very old and were introduced in the sixteenth century in the era of Muslim emperor Sher Shah Suri. These were extensive and administrative agrarian restructuring foundations that continued to be helpful for the following rulers for three hundred years (Hamdani 2001: 1, Ali and Nasir 2010: 4). Sher Shah Suri introduced revenue policies, which were equally supportive of government and common landowners, as these were widely used for the alleviation of poverty and the redistribution of land among poor and landless people. These reforms also avoided corruption of the relevant officers, by transferring them in their respective areas of jurisdiction, every two or three years.

In the reign of the Mughal emperor, Sultan Akber, one of his advisers, Toder Mul, suggested the levying of an agriculture tax and regularized the land record management system for the collection of such revenue from the landowners (Ali and Nasir 2010: 4). For this reason, a comprehensive plan of land assessment was prepared, and land was grouped into four different categories according to their fertility. The ratio of tax was fixed, being one third of the gross produce of the landowner; this was the share of king (Salim 2008: 1).

After the end of Mughal Empire, administrative control in the Subcontinent Indo-Pak was taken over by the British colonial power (East India Company). They implemented a scientific system based on their own pattern, which was very costly and complicated. For land management and record keeping, they conducted a large-scale cadastral survey, and the revenue ratio was now settled in cash, instead of in kind, after the fertility survey of each village. A special administrative hierarchy was established for the collection and monitoring of the revenue process and the local governance structure (panchayats) was abolished. The land tenures were based on the concept of private property in land on the English pattern, allowing sales and mortgages of lands to the money-lenders (Raza et al. 2005: 1, Salim 2008: 8). The British government introduced a proper cadastral system through the land registration act, and

[24] Before independence, Pakistan and India were the parts of combined region of Subcontinent Indo-Pak.

similarly systemized the transfer of property from one owner to another through the Transfer of Property Act.

Pakistan inherited the same pattern of the land tenure system, and to improve land management, various land reforms and amendments in these laws were introduced in the diverse time periods. In this chapter, the different legislations implemented in Pakistan related to the study, and the land reforms are discussed. In Section 5.2, the Transfer of Property Act is presented, and then in the next Section 5.3, the Land Registration Act is explained with its necessary amendments. Section 5.4 elucidates the Punjab Land Revenue Act with a further explanation of local governance structure in Punjab, and then a short explanation of the Stamp Act 1882 and Land Acquisition act is given in Sections 5.5 and 5.6, respectively. Finally, the most important inheritance law implemented in Pakistan is explained in Section 5.6. After this, the whole legislation structure and related land reforms of Pakistan are presented in Section 5.7. A brief summary of the whole chapter is provided in Section 5.8.

5.2 The Transfer of Property Act, 1882

This law is related to the record of usufructuary rights, sales rights, and transfer rights against property, whether moveable or immovable. Immoveable property means all things attached to the earth including land buildings, hereditary allowances, fisheries, rights to ways, or benefits that arise from the land, but standing timber, growing crops, grass, fruits on the trees, and machinery are excluded from the record, as these are included in moveable property such as cash, saving certificates, insurance, and jewelry. This law was implemented on 1st of July, 1882 and was amended three times before the independence of Pakistan and four times post-independence. These amendments explain the situations for both agricultural and non-agricultural land. Most of the land in Sindh and Punjab is agricultural land, and so amendments suggested by these two provinces are related to agricultural land.

Transfer of property means that anyone who is the owner of any property can transfer it to some other living persons, companies, or any organization. During the process of the transfer of property, the following conditions have to be fulfilled.

1. There must be free land (free from any litigation[25], any possession of other parties)

[25] A contest authorized by law, in a court of justice, for the purpose of enforcing a right.

2. The man or organization to whom this property is going to be transferred must be mature (adult) and not having an unsound mind.
3. Finally, the owner of the property presents a sale deed on judicial paper (stamp paper) before a sub-registrar[26] after a statement of the owner, such as a property will be transferred to the purchaser.

According to the law, a person can transfer his property to one or more living persons in the present or in the future, but the chance of an heir-apparent succeeding to an estate, the chance for relation obtaining a legacy on the death of a kinsman, or any other mere possibility of a like nature, cannot be transferred. Similarly, in the case for a breach of a condition subsequently, property cannot be transferred to anyone except the owner of the property. Property of any kind may be transferred, except state land, which can be allotted to farmers for cultivation or are granted to them on lease. In the case of restricted property, where the owner has some specific rights, these rights cannot be personally transferred to himself.

The operation of transfer of land deals with the easements, rents, and profit after the transfer, and all things attached to the earth (in the case of trees, all things rooted in the earth, and in the case of buildings, embedded in the earth) are transferred to the new owner. Similarly, in case of machinery, moveable parts belong to the old owner, and immovable parts are the share of the new owner. Sometimes, the owners come to an understanding, e.g., in the case of tube wells on land, when a landowner transfers the land to the next owner, the new owner pays for the amount of moveable machinery, if he wants to keep the tube well in his own custody; eventually, both make an agreement for the water use and electricity charges and can use this well collectively. This depends on the contract of transfer.

The transfer of the property act allows oral transfer, and written expression is not required by law. Most people do not receive their cadastral document at the time of intergenerational land transfer and avail themselves of the facility of oral transfer to avoid a long legal process. When ever anyone who is the owner of the immovable property wants to transfer such property to some other body through a gift or sale, this must be undertaken legally, when it would be registered before a sub-registrar in the same district or tehsil where such property is situated. This oral transfer of property sometimes makes problems in the process of transferring land to the next generation, if the share is not specified for the shareholders in the

[26] Sub-registrar is the governmental person authorized for the confirmation of transfer at district or tehsil level. Administrative structure and the various official posts will be explained in the next section.

inheritance. In addition, there is also a rule of benami, through which a person can transfer his property to any unknown person or more than one person. If legally two or more persons have the right to transfer immovable property, it is not allowed for one person to transfer that property without asking for consent from the others. The other owners can challenge such sale, but according to Section 53 of this act, sometimes a person fraudulently represents his authorization to transfer certain immovable property. Similarly, in the case of common property, problems sometimes occur when only one co-owner sells or transfers his share. According to law, any person who is authorized to hold his share and is competent to contract or sell his/her own immovable property can transfer his/her property in exchange for money or a parallel land. In the case of common property, one co-owner cannot sell any part of it without the consent of the other partners, but if the land has been transferred legally, then the owner is free with regard to all his actions and rights.

Sale is a transfer of ownership from the owner to the purchaser and must be legalized through a registered sale deal before the sub-registrar. Any immovable property, whose value is more than Rs.100, must be transferred through a registered sale deal.

Sale of a property will be completed by:

1. Statement before the registrar
2. Delivery of possession to the buyer

5.2.1 Rights of Landowners

A landowner has the following rights:

1. To keep the land by himself throughout his life.
2. To sell the land to another one, but for this, he has to reveal all the characteristics of the land and all other necessary details to the buyer. If the property is held by more than one person, then it is necessary for every person to agree to the sale, otherwise the seller can sell only his part. However, if the property is in the form of the shared house and is not divided, then the seller can still sell, but in this case, the buyer cannot claim his share if he is not the part of this family. If there is any issue in court related to the property, that property can be sold, but the buyer cannot use it without the final decision of court. In addition, he is also bound to answer all the questions of the buyer and hand over the complete documents to the buyer.

3. To transfer and to distribute the land and even to gift his land according to Islamic rules and regulations at his will.

5.2.2 Process for Land Purchaser

The land purchaser has also some rights:

1. He has all those rights as the landowner after payment for land to the seller, but first he has to perform his duties to check all the documents thoroughly.
2. It is the responsibility of the purchaser to make sure that the person who is selling the land is authorized to do thist or not, and for this purpose, the only authority is the patwari who holds all the records of the land.
3. Similarly, for the transfer of land, both the land holder and land purchaser must go to the patwari for documentation. The patwari gives the record of land to any owner of land situated in his halqa/ jurisdiction and also enters any "mutation" of agricultural land. Through this mutation, the buyer becomes the owner of the agricultural land, and old owner transfer the property to the new owner.

5.3 The Registration of Property Act, 1908

As explained in the previous section, for the sale and purchase of property, it is necessary to register the documents; this act deals with this process of the registration of property, whether moveable or immovable. The act was brought into force on the first day of January 1909 and was amended six times, four times before partition during the era of British India and twice after the independence of Pakistan. The amendments during the time of the combined sub-continent were mainly for the structure of the registration department, and after independence, these amendments redefined documentation relating to priority and compulsory registration.

The first time that these terms of priority and compulsory registration was used in British India was in 1864, when the first complete enactment as to the registration of documents was passed, and all previously applied systems of unregistered documentation were abolished. Under this new system, a clear definition of the optionally registered documents was available, which were not compulsory to register. The same definition is applied in this act in Section 18. According to Section 17 of this act, documents for which the registration is compulsory are: property whether moveable or immovable, immovable property given as a

gift[27] to someone, immovable property of the value of one hundred rupees and upwards, which can create or assign any right, title or interest, presently or in the future. Non-testamentary instruments involve the transferring or assigning any decree or order of a Court or any award when such a decree or order or award purports or operates to create, declare, assign, limit, or extinguish, whether in the present or in the future, any right, title or interest, whether vested or contingent, of the value of one hundred rupees and upwards, to or in immovable property. Any joint instrument share, notwithstanding that the assets consist in whole or in part of immovable property, also has to be registered, for example, tube wells. In the case of the transfer of property to an adopted son, the authority, executed after the first day of January, 1872, and not conferred by a will, shall also be registered. Similarly, in the case of the authorization of any attorney to sell any immovable property, the power of attorney has to be registered.

According to Section 18 of this act, some documents are optionally registerable; these are mainly parts of particular transactions, e.g., family arrangements and compromises, and sales agreements. Although sale agreements are a recital of part of purchase money to the purposed vendee, they do not need to be registered according to the Section 18 of the Registration Act, 1908. This is known as irregular sales or defective sales, and because of these sales, unauthorized persons can sell the land of others. Generally, these cases can be observed in the case of attorneys, where the actual owner of land is not interested in selling, but the attorney sells the land by using his power, which is executed to him under stamp act Section 2 and Subsection 21.

Similarly, in the case of family arrangement and compromises, if there are some agreements, then there is no need to register those writings; for example, if the joint family wants to separate their land, then partition is made, but this partition is not necessary to be registered according to Section 18 (2) clause ‘v’. The will of a deceased person is another document that is optionally registerable during the life the testator,[28] but after his death, any person claiming to be an executor may present it to the registrar or sub-registrar office according to Section 32.

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[27] Gift is the transfer of certain existing movable or immovable property made voluntarily and without consideration, by one person, called the donor to another, called the donee, and accepted by or on behalf of the donee. Such acceptance must be made during the lifetime of the donor and while he is still capable of giving. If the donee dies before acceptance, the gift is void.

[28] Testator is a person who makes or leaves a will.

Similarly, Section 50 of this act explains that certain registered documents relating to land take priority over unregistered documents. A person possessing a property under unregistered documents would be entitled to the rights under Section 53A of the transfer of the property act, 1882, if all the conditions of that section are fulfilled. According to Section 17 Sub-section 2, any registered document, which does not have priority under this law, cannot be executed against an unregistered preferable document.

The administration structure under this act follows a specific hierarchy. The highest rank is inspector general of registration, who is appointed by the provincial government for the territory of such government. The inspector general may hold another office under the same government. From an administrative point of view, the provincial government can divide the province into divisions, districts, and sub-districts. This administrative structure is explained in Figure 1, where the "highest" part is the province and "lowest" part is the village. The long chain hierarchy within this administration is complex, so that in the case of intergenerational transfer of property, most landowners do not register their property and believe only in oral transfer as per Section 9 of the Transfer of Property Act, 1882.

The provincial government appoints registrars and sub-registrars at the level of the district and sub-district (tehsils). In the absence of the registrar from his duty, the inspector general of registration may appoint some other person in his place. A judge of the district court in his jurisdiction may perform the duty of the registrar at the local level in the temporary absence of the registrar or until a new appointment. Similarly, in the case of the absence of the sub-registrar, a person who is appointed by the registrar can act as the present incubant, until the vacancy is filled. Some inspectors of registration are also appointed by the provincial government as the subordinators of the inspector general of registration at the district level. These registrars and sub-registrars are responsible to register the properties situated in their jurisdiction. According to Section 72 and 73 of this act, the Registrar is also responsible for hearing appeals and applications preferred to him, against the refusal to register documents by the sub-registrars under him.

For the registration of an immoveable property, a landowner needs legal documentation known as a cadastral, prepared by the patwari according to the value of the land on the legal paper known as the stamp paper, which has the value of two percent of the total land value. After the preparation of this stamp paper, the land owner takes this paper to the sub-registrar or registrar and pays him one percent of the land value, which the registration fee or charges.

The registrar checks all the documents and records and then finalizes the registration of the property. This not only is a long process, but also involves heavy costs, and because of this, most people avoid registering inherits property.

5.4 The Punjab Land Revenue Act, 1887

This act, which came into force in January 1889, is related to land revenue in the province of Punjab and extends to the whole of the province. According to this law, the agriculture year for the collection of revenue starts from first day of July, and the Board of Revenue is responsible for this activity. The administrative setup of Board of revenue is also grouped into divisions and districts as shown in Figure 5.1. The job descriptions of the various revenue officials according to this act are given in this Table 5.1, but this applied before 2001. In this new century, the power of the board of revenue is supported by local governance. This new hierarchy is shown in Figure 5.6.

A patwari (see Table 5.1), who is responsible for collecting land revenue, reporting the land transfer information, preparing the documents in the case of the sale or transfer of immovable property, managing land records of the area within his jurisdiction (known as a patwar circle; Figure 5.1), is the administrator at the grass root level. Generally, one patwari is responsible for one or two villages or 8000 acres. He has the most information about the area, and so he is a very important representative of the government. He has to record ownership and tenancy in a register of rights and is thus the king pin of the revenue and registration department. He has to deal with the area mentioned in massive maps (see Appendices 1 to 3 for the study regions).

The tehsildar is the head of the office in a tehsil and is responsible for all revenue and land matters within his jurisdiction. In order to be able to solve official problems, he has to keep himself constantly on tour and in contact with his subordinates. He needs to know about the land and crop situation, and so he visits the various regions under his jurisdiction on a regular basis. He is an assistant collector of grade I, and in the criminal authority, he is of a magistrate of grade II. The niab-tehsildar has more or less the same duties as an assistant of the tehsildar in his jurisdiction, and his powers are defined as an assistant collector of grade II and magistrate of grade III. Before 2001, an Assistant Commissioner was in charge of the sub-division level for revenue collection and had to report to the Deputy Commissioner at the district level, who was answerable to the Commissioner at the division level. All these ranks

were selected through competitive examination of the civil services and were appointed by non-elected bureaucracy.

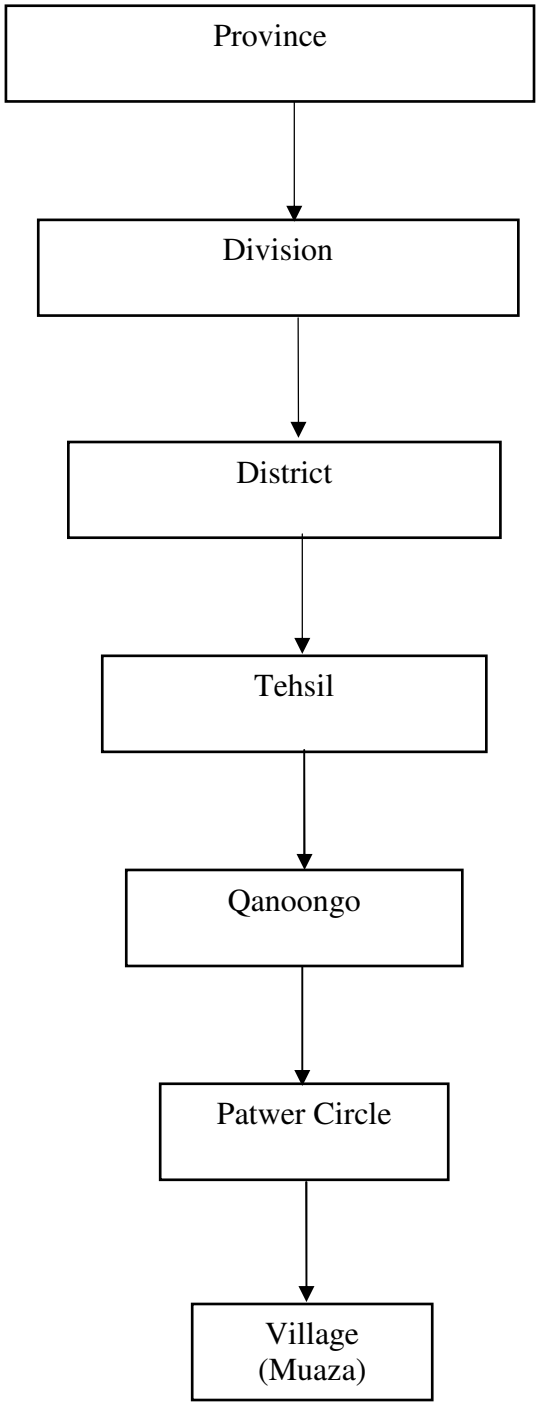

Figure 5.1: Administration Structure of the Country

Source: Own Presentation

Table 5.1: Structure of Provincial Board of Revenue for Revenue Collection till 2001

Post	Category	Job Description
Member	Secretariat	Chief Controlling Authority for revenue matters in the Province
Secretary (Revenue)	Secretariat	Controlling Authority for revenue matters in the Province
Commissioners	Field	Appointed by the Provincial Government for each Division and exercises control over all the Revenue Officers and Courts in his division
Deputy Commissioners.	Field	Appointed by the Government for each district, with the powers of Collector of the district. All Revenue Officers and Revenue Courts in the district are subject to his control and superintendence.
Asst. Commissioners.	Field	Exercises the powers of the sub-divisional Collector
Tehsildars	Field	Vested with the powers of Assistant Collector, 1st grade.
Naib-Tehsildars	Field	Vested with the powers of Assistant Collector, 2nd grade
Qanoongos	Field	Supervises the work of the Patwaris in the Qanoongoi.
Patwaris	Field	The lowest functionary of the Revenue department. He maintains and updates the record pertaining to his Patwar Circle.

Source: Own Presentation

In 2001, General Musaraf tried to merge the setup of local governance with this selected bureaucracy, as the elected member of council (chairman)[29] is senior to the member of non-representative bureaucratic member of provincial government (District Coordination Officer). This study is depicting only with the part of local governance, which is explained here and is not included the civil society.

Present Local Governance Structure in Pakistan

The present governance structure of Pakistan is mainly distributed into three sub-divisions: the Union Council, which is the lowest tier, headed by a tehsil council, with the tehsil council being a part of district council.

[29] Nazim of district council

Union council: At present, the local governance structure is based on union councils consisting of 21 members in each council. The nazim is the head of the union council, and the naib nazim is his deputy. Thirteen members including the nazim and naib nazim are elected through elections, in which two male and two female members are the representative of labor and one is of a minority. In addition to elected members, there are seven government employees and functionaries in every union council, all of whom report to the Secretary of the Union Council. This Secretary is directly appointed by the Provincial State (shown in Figure 5.2).

The Union is a part of the tehsil and of the district. In one district, there are normally large numbers of unions; for example, in Gujranwala, there are 192 union councils. All Nazims of union councils in one district are members of the District council, and all naib nazims are members of thesil councils. After election, nazims and naib nazims select district nazim for district councils and tehsil nazim for tehsil councils.

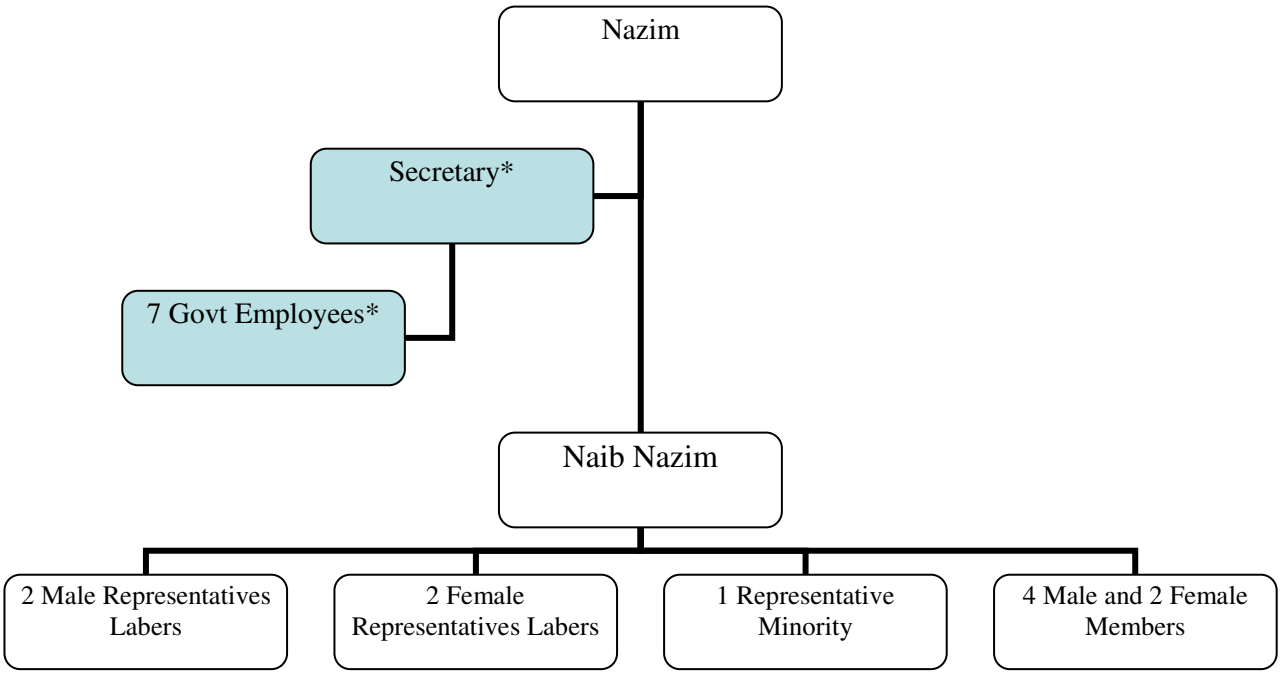

Figure 5.2: Structure of Union Council Pakistan

Source: Government of Punjab, Pakistan

*: Gray color indicates those directly appointed by the government (non-elected members)

Tehsil council: The naib Nazims of all union councils are the member of tehsil councils, and they select one nazim for the tehsil as the tehsil nazim among themselves. The structure of tehsil council is explained in the Figure 5.3.

The Union council is responsible for the revenue collection on land and property together with other responsibilities, and the tehsil council has to register all the property of the area. Thus, the tehsil council has a full record of registration. The patwari is the lowest rank in the revenue and registration departments at the tehsil level and is responsible for keeping a record of the registration and all other details regarding land revenue.

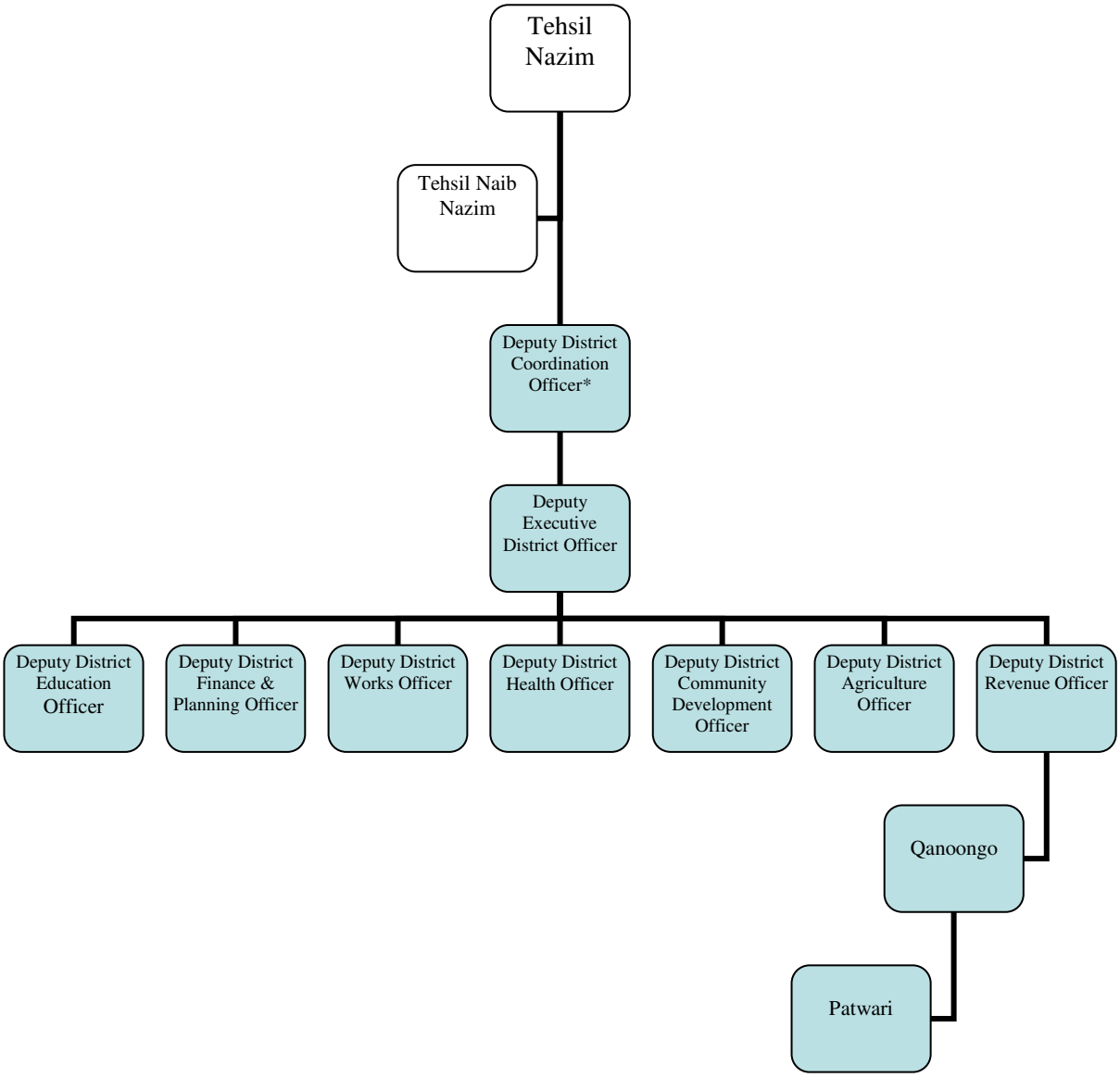

Figure 5.3: Structure of Tehsil Council Gujranwala, Pakistan

Source: Government of Punjab, Pakistan

*: Gray color indicates those directly appointed by government (non-elected members)

District council: The District Nazim is the chairman district council together with all union and tehsil councils of the district but heads the bureaucracy at the district level as given below in Figure 5.4. Thus, we can say that the district council consists of all elected nazims of the unions and some government appointed officials who have different responsibilities at the district level. For example, the agricultural department has to look after the sites and farms of the districts for the target production of all crops and to check the implementation of crop production strategy and the availability of proper agricultural inputs for the production. They are also responsible for demanding the budget for the maintenance of degraded lands from the finance and planning department. Similarly, the revenue department is responsible for collecting the revenue and for land acquisition. These departments cannot take any decision without the approval of elected members of the district council.

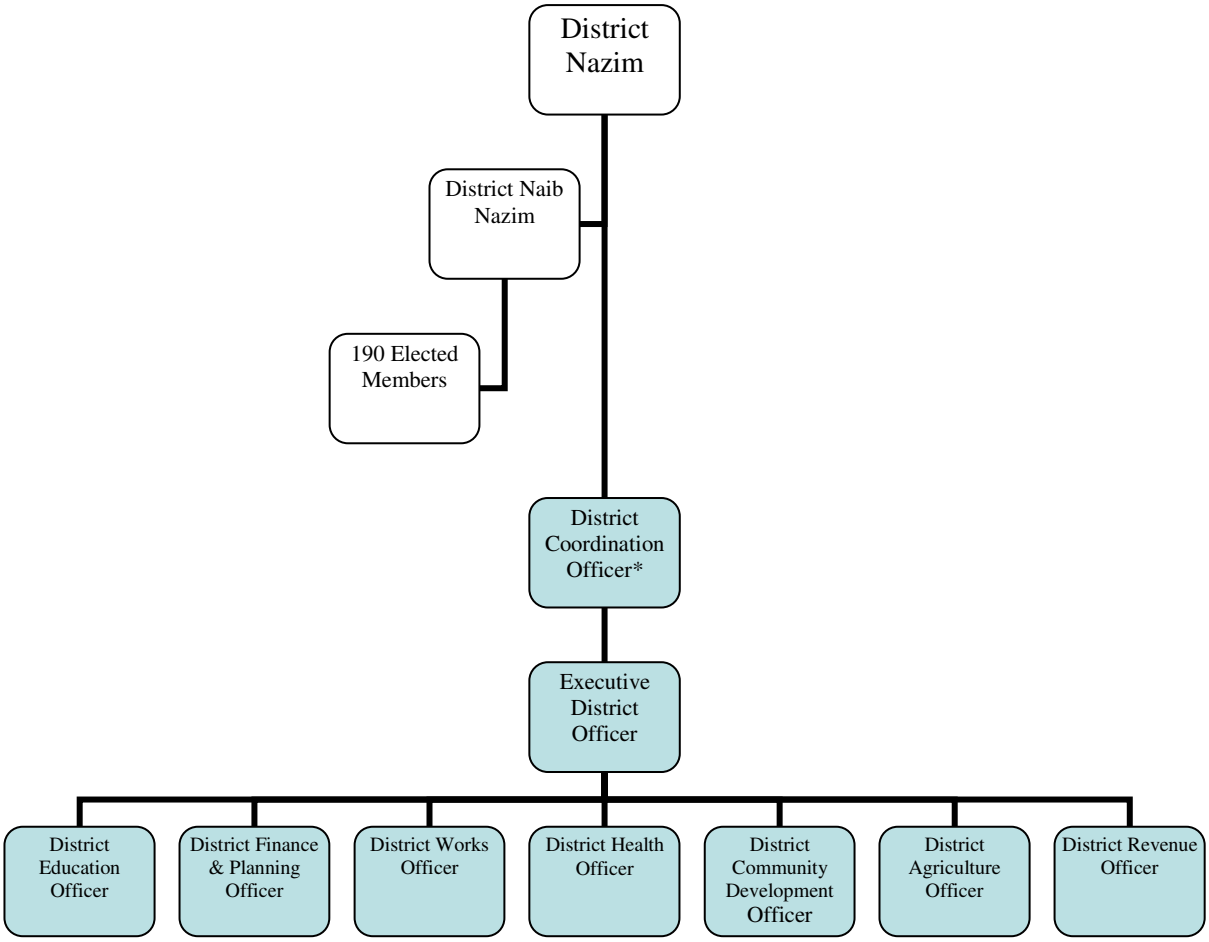

Figure 5.4: Structure of District Council Gujranwala, Pakistan

Source: Government of Punjab, Pakistan

*: Gray color indicates the directly appointed by government (non elected members)

Present Structure of Registration and Revenue Department: As explained above, in Pakistan, the non-elected bureaucracy has a very long chain (see Table 5.1) and is supported by local governance at the district level (see Figure 5.5).

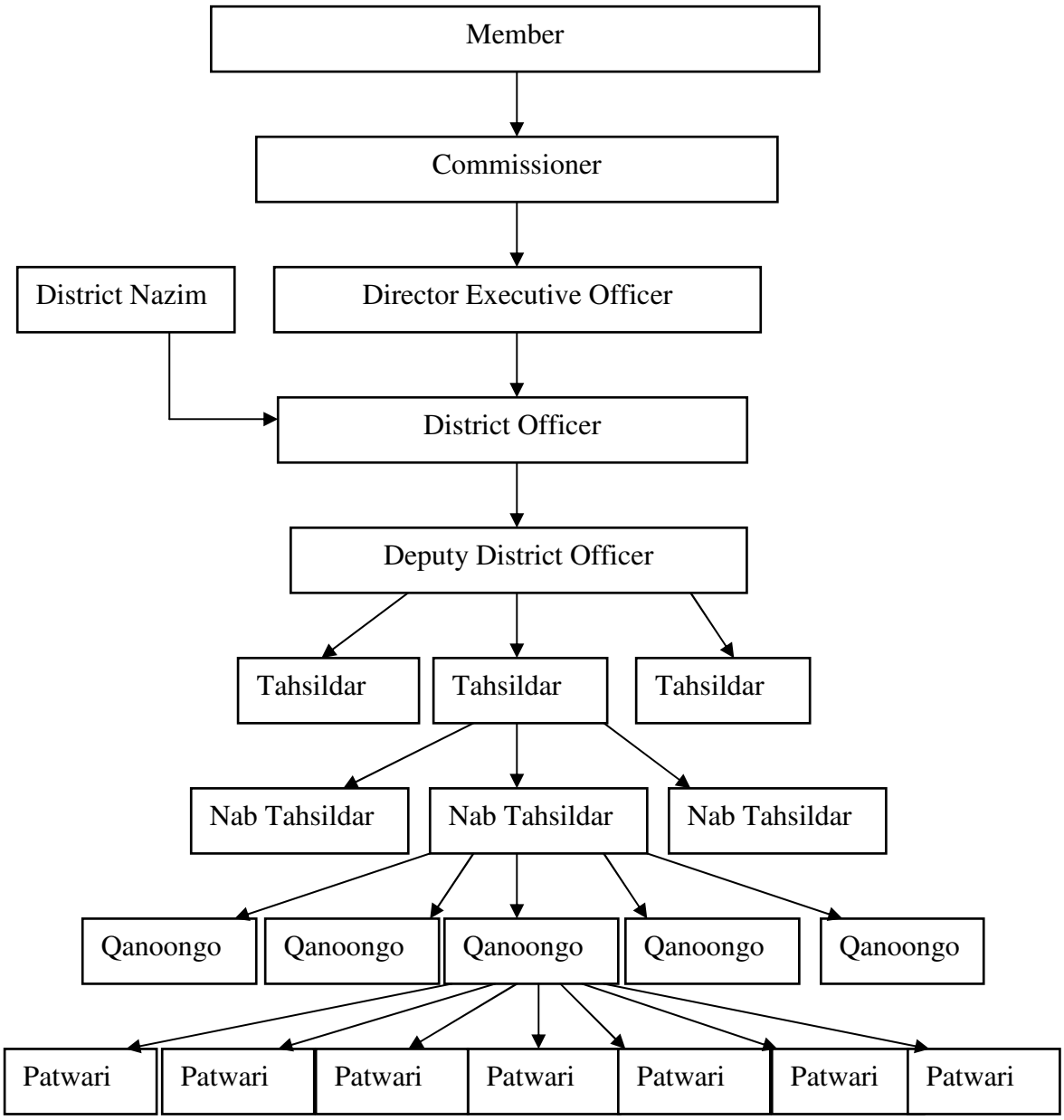

Figure 5.5: Administration Structure for Excise and Taxation Department

Source: Own Presentation

5.5 Stamp Act, 1899

This act was amended, according to the central law ordinance 1960 and was implemented in the whole of Pakistan, with effect from 14th October 1955, for the transaction of legal documents. Before this, when Pakistan was combined with India, it was amended sixteen times, after it came into force on May 1st, 1899. Section 2 of this act explains the details of all these documents, together with transfer procedures.

In Section 2(10) of this act, the procedure for the transfer of a title for immovable property, which is of the specific amount of legal stamp required by an authorized officer, is mentioned. First of all, the landowner needs to know the value of his land according to the area. This area value is declared by the registrar or sub-registrar. The landowner obtains legal papers known as the stamp paper, which is two percent of the total value of his registry. In the case of sale, he has to present these documents at the office of the registrar together with two witnesses, because this paper must be duly signed by these two individuals in the office of the registrar. The landowner has to pay one percent of his land value for the registration fee, and then his registered sale deed will be duly executed.

According to Section 2(15), in the case of the partition of land, such legal documents are also necessary, but in this situation, any order for affecting the partition passed by authority of the revenue department is sufficient. Thus, most of the villagers want to save their time and money and avoid going to the registrar's or sub-registrar's office. They contact the local patwari and ask him to prepare the temporary transfer documentation, which is known as 'fard mulkiat'.

Power of attorney is a legal document in which one person (the principal) appoints another person to act as an agent on his or her behalf, thus conferring authority on the agent to perform certain acts or functions on behalf of the principal. Section 2(21), of this law explains the conditions of such Power of attorney, which empowers a specified person in place of executant of that attorney. Through these documents, a person can depute his rights to someone else, because of some specific reasons; for example, in the case of his absence from the area, a landowner is not able to look after his land by himself, and so he can give his rights to some other person or persons. Similarly, this might occur in the case of illness or because of old age. Sometimes, a landowner is female and, because of cultural boundaries, is not able

to deal with legal matters. Thus, it is practical to be allowed to execute attorney for someone else.

There are two types of power of attorney.

1) Special power of attorney: through this, the donor[30] (s) can give only specific rights to the donee[31](s); for example, for the supervision, management, and looking after of the property, to deposit the rent, and to file the cases on behalf of the donor.
2) General power of attorney is the execution of the authority for all matters of the property; for example, not only supervision and care of the property but the installation of new machinery and if necessary, the sale, transfer, and conveyance of the property; even in the case of the death of one of the co-attorneys, the others all are bound to perform his legal deeds.

The procedure of contract for the transfer of power is the same (statement of contract for special and general power of attorney are presented in Appendices 4 and 5) as that discussed above, but in this case, the registration fee is exempted. Registration of power of attorney is necessary only in the case if the donee has to be authorized to use some of the recovered funds from the property of the donor for his own benefit; otherwise, it is not necessary to register the contract.

5.7 Land Acquisition Act 1894

The Land Acquisition Act 1894 was established for the acquisition of land for public purposes. This law came into force on 1st March 1894 and was extended to the whole country. Many amendments were made in this law, according to the needs of the time.

According to this law, the provincial government is authorized to acquire the land in any locality that is likely to be needed for public purposes, and on behalf of the government, a collector can issue the notification for the required locality. The government can appoint any officer for the survey of the land or to set the boundaries of the respected area; this officer is responsible to pay damages in the form of compensation. If any person is not willing to accept the given compensation, the officer is bound to forward the dispute to the collector.

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[30] Donor who executes the power of attorney
[31] Donee is the person who is authorized to use the rights in the absence of donor

The patwari is a very important person because, generally, the collector of the district[32] normally appoints him for the survey on behalf of executive district officer (revenue) when land in any locality is needed or is likely to be needed for any public purpose or for a company. He has considerable influence. Even after the survey, if any person has any objection to the survey report, and he applies for reconsideration, the collector can forward his recommendations to the executive district officer (revenue), and he is the final authority for making decisions on land acquisition. He can ask the patwari to confirm the report. Khan (2006) has pointed out that the corruption exists within this department.

Section 4 (1) explains that land can sometimes be acquired without prior survey of the locality. In such cases, a declaration is made by the officer, who is duly authorized by the provincial government and the secretary of the government. After the issue of the declaration, the commissioner can ask the collector to take charge of the acquired land. Thus, he will send a notice to the involved persons, and they can claim their compensation and for damages and lay other objections in writing after fifteen days in front of collector, who will serve all these complaints.

In this law, the compensation prices depend on the market values of land at the time of notification and are defined as the value of land similarly situated and in similar use. In some cases, person finds that the compensation equals the value of the registry of his property. This will be decided according to the situation of the land.

5.7 Law of Inheritance

Inheritance is usually treated as an unimportant issue for policy formation concerning the security of tenure, land rights, land reform, or regularization (United Nations Human Settlements Programme (UN-HABITAT) 2005). However, this is one of the most common ways of acquiring land or of gaining access to land. In all Muslim societies such as Pakistan, inheritance rules are generally derived from religious sources for the division of an individual's property upon death. The rules are implemented by the family and community and are upheld by the State. Before the creation of Pakistan, Mohammedan Law was implemented for inheritance in Indian Courts. After partition in 1953, Islamic Shari'a Law was introduced, and in 1960, inheritances were announced to be distributable according to this

[32] In charge at district level activities

law. In 2002, the Supreme Court of Pakistan made an amendment for giving shares to orphan grand-children.

As for all other inheritance laws, Islamic inheritance law allows the distribution of all kinds of property of the deceased, whether moveable or immovable, among heirs. However, the Islamic Law of succession has many distinctive features which are given below.

1. This law provides a wide range of beneficiaries of these assets
2. Fixed percentage share for the beneficiaries
3. A will is very important for a Muslim, and the importance of the will is clear from the following hadith,[33]"It is the duty of a Muslim, who has anything to bequest not to let two nights pass without writing a will about it." (Sahih al-Bukhari), but a person is restricted to leaving only one third of his assets according to his will, and the remaining two thirds will be distributed as per rules of Islamic Inheritance Law.

When a Muslim dies, some liabilities are necessary to be paid from his assets.

- All expenses of his funeral
- All debts, which he has to pay
- Implementation of his will
- Distribution of remaining assets among heirs according to Islamic Law

5.7.1 Beneficiaries of Inherited Property

Islamic Inheritance law explains the different levels of beneficiaries, who inherit the property of a deceased. In level one, all those heirs are included who are classified as primary or immediate family members, in which the spouse, children, and parents can be included. Level two, which is categorized as the secondary level, includes the grandchildren (only children of the son, in the case of the son having died), grandparents (in the case of the parents having died), brothers and/or sisters (in the absence of father and son, only), and uncles and/or aunts (in the case of the grandparents also not being alive). Similarly, the distribution occurs to the next levels, in the case of the absence of heirs from previous levels; it is not practical to give the share to the heir in level three, if the heir in level two is alive.

[33] Hadith means the narration of Holy Prophet Mohammad (Pease Be Upon Him)

Islam has a clear definition for the heirs; for example, adopted children are not considered as the shareholder in the property of the deceased. Similarly, orphan grandchildren (daughter's children) are also unlikely to obtain any share from the assets of the grandfather, if he has not mentioned them in his will. The same occurs for an unborn child or a child who is the offspring of the spouse of the deceased. A person can give some share of his property as a gift to these defined members of his immediate family or can leave something (one third of his total assets) for them in his will. The last category (offspring of the spouse) can obtain a share from his mother's property according to the rules.

5.7.2 Fixed Percentage Shares

Before the explanation of fixed percentage shares in Islamic Shari'a,[34] some terms should be clarified, for example, sharer and residuary. Sharers are those heirs who will receive their allotted share according to their entitlements, and residuaries are those who will receive the residue according to their entitlement as per the given rules as (1) remote relations are excluded by the nearer, and if no near relation is available, the residuaries will receive all estate of the deceased. (2) Sometimes, the ratio of double for a son in comparison with a daughter will also generate some residues. Shares from deceased males and females are different for some heirs, but the share of the children is the same from both parental sides. All the details of this sharing are explained below.

Distribution of inheritance between first level heirs for a deceased male: After the performance of his necessary duties, his property will be distributed among his first level heirs, such that his wife will receive one eighth of the remaining property in the case of having children, whereas if there are no entitled descendents,[35] she will receive one fourth of the remaining property. If the deceased has only one daughter and no son, then that daughter will receive half of his remaining assets, but in the case of two or more daughters, the shares will be two thirds for all, which will be equally divided between them. If the departed is blessed with sons and daughters, then every brother will get double the share of his sister.

In the case of parents, the mother is the direct sharer of the son's property and will receive one sixth from this property, if entitled descendents are present. If the deceased has no children, then here again two situations will arise; in the first situation, if no other relation

[34] Islamic law
[35] Entitled descendants: sons and daughters

such as spouse, father, brother, and sister of the died person exist, then the mother will receive one third of his property, and if any of these relations is alive, then the mother will get one third of the residue. For example, if the wife of the deceased is alive and has no child, then according to the law, the shares of both the widow and the mother are given below in Equation 5.1 and 5.2.

Share of the widow = 1/4 5.1

Share of the mother = 1/3 of the residue (1/3 of the 3/4) = 1/4 5.2

The father's position as an heir has three characteristics: (1) as a sharer, (2) as a residuary, (3) as a sharer plus residuary. In the presence of other entitled descendents, the father will be a sharer and will receive one sixth of the deceased's property, but if he has no grandchildren, then he can take the residue, and in the presence of female descendents, he will first take his prescribed share of one sixth and then will take the residue.

Figure 5.7 (a) explains the situation of all the first level sharers with their fixed shares; similarly, part b of Figure 5.7 depicts a scenario in which no entitled descendents exist, and the father and mother inherit as residuaries. Figure 5.7 (c) indicates the situation in which the father acts as both sharer and residuary in the presence of the only female daughter of the deceased.

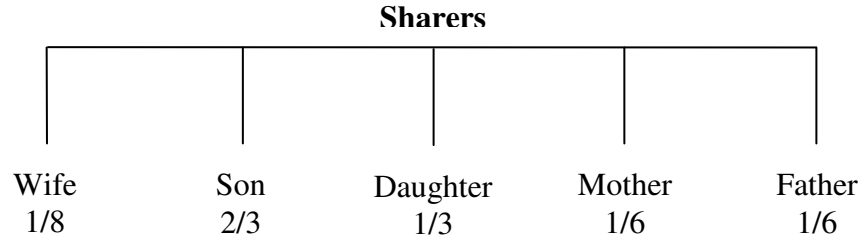


Figure 5.6 (a): Distribution of Assets among First Level Sharers

Source: Own Presentation

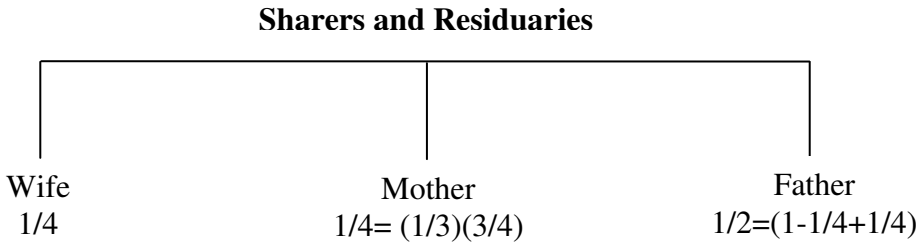


Figure 5.6 (b): Distribution of Assets with the Wife as a Sharer and the Mother and Father both as Residuaries

Source: Own Presentation

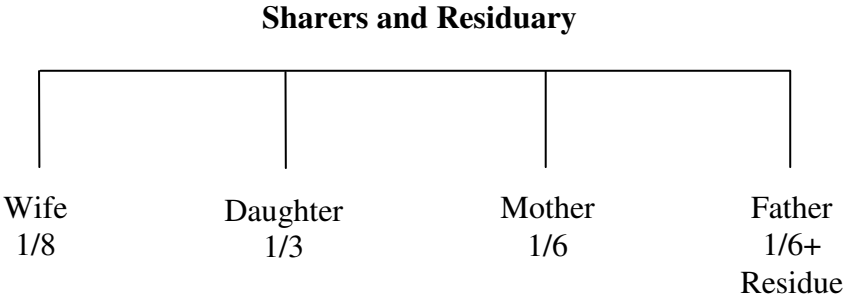


Figure 5.6 (c): Distribution of Assets where the Father acts as a Sharer and Residuary

Source: Own Presentation

In the case of a deceased male, the distribution of property to the heirs of the next levels: According to Inheritance Law, the secondary and next level heirs in the queue are entitled to inherit only in the absence of the particular primary heirs or heirs from the previous level; for example, if the son has died from the group of primary heirs, then his children are entitled to be sharers, and the property will be distributed according to the rules explained above. If the son of an excluded son is present among his entitled descendents, then his only daughter will get half of his share, whereas two daughters will get two thirds, and a son will get double his sister's share as explained in Figure 5.8. The daughter's children as previously explained are not eligible for the property of grandparents, but they can receive something as a gift or as part of the will. The only possibility of them receiving a share of the two thirds portion of the grandparents is if there are no sharers or residuaries, which is very rare.

Grandparents represent the next level in the queue after parents and are eligible only if the father and mother no longer exist. The grandmother may be father's mother or mother's

mother of the deceased and cannot be excluded from the list of heirs in the absence of the father or mother and will receive one sixth of his property as a sharer. Similarly, the grandfather will receive the same proportion, according to the same rules, that the father of the deceased receives, in the absence of a father or mother.[36]

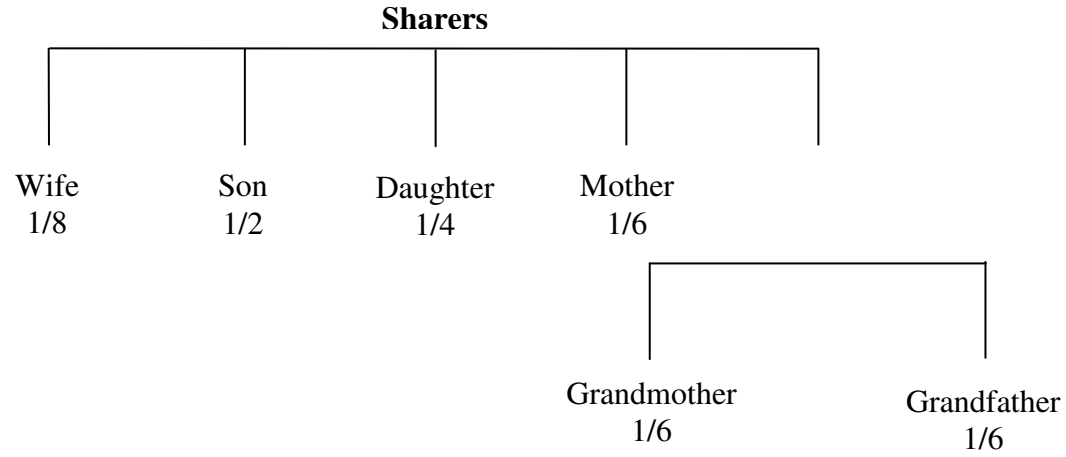


Figure 5.7 (a): Distribution of Assets where a Father Does not Exist and the Share of the Father Transfers to the Grandparents as Fixed Sharers

Source: Own Presentation

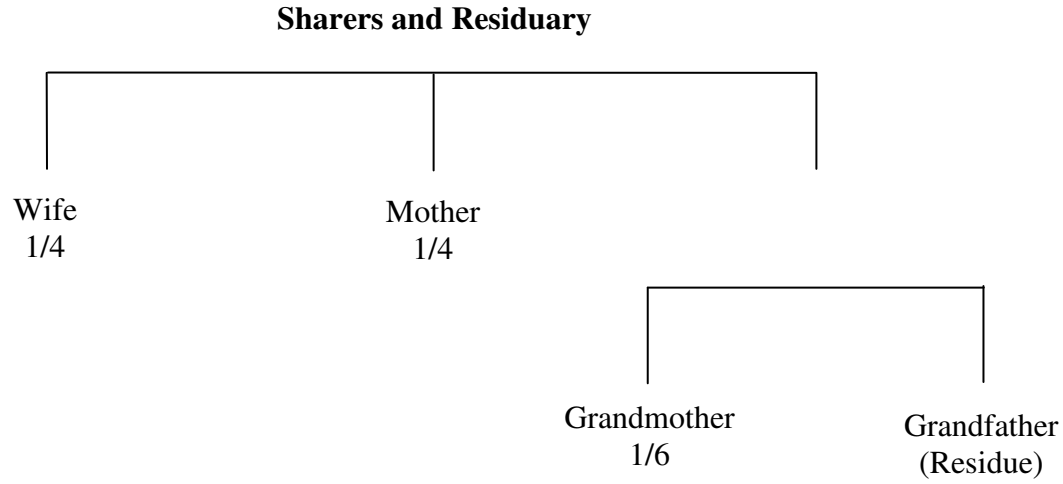


Figure 5.7 (b): Grandmother Receives a Fixed Share and Grandfather Receives the Residue in the Absence of Descendants

Source: Own Presentation

[36] Grandparents of father in case of missing father and grandparents of mother in case of missing mother

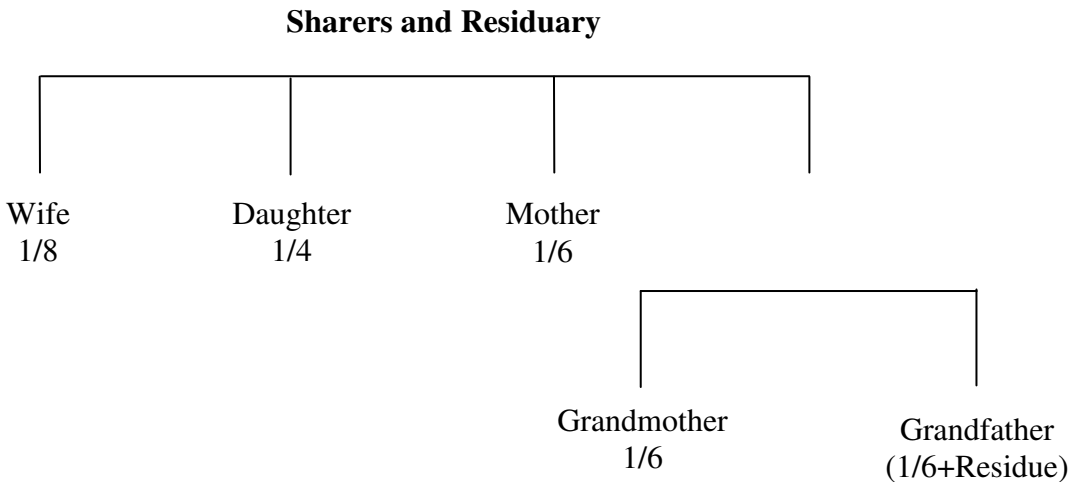


Figure 5.7 (c): Grandmother Receives a Fixed Share and Grandfather Receives a Presubscribed Share plus the Residue in the Absence of Descendants

Source: Own Presentation

Similarly, if the deceased has no entitled descendent or ascendant at the primary level,[37] then the property passes to secondary level heirs, which are brothers and sisters, who will receive shares only in the case if the father and sons of the deceased have previously died or not existed. Brothers and sisters are also categorized in three different groups, (1) full brothers and sisters, from the same mother and father, (2) uterine brothers and sisters, from the same mother but different father(s), (3) consanguine brothers and sisters, from the same father but different mother(s). Shares of property in all these three cases are different, as given below.

In the case of distribution to full brothers and sisters, if there are no female descendants, and the deceased has only one sister, then she will get half of his property. In the case of more than one sister, then they all get two thirds collectively, and if some brothers also existed but are deceased, then there will be a ratio of two to one between the brothers' and sisters' shares, as shown in Figure 5.9. If the departed is the brother of a male only, then in the case where no male entitled descendants exit, he will receive one sixth of his property; similarly, if there is only a sister, then she can also claim for a one sixth portion in the same case, but if the deceased has brothers and sisters, then they can have one third of the remaining property, after paying the necessary duties of the deceased. This case is shown in Figure 5.10.

[37] Real son and father are the primary level descendent and ascendant respectively.

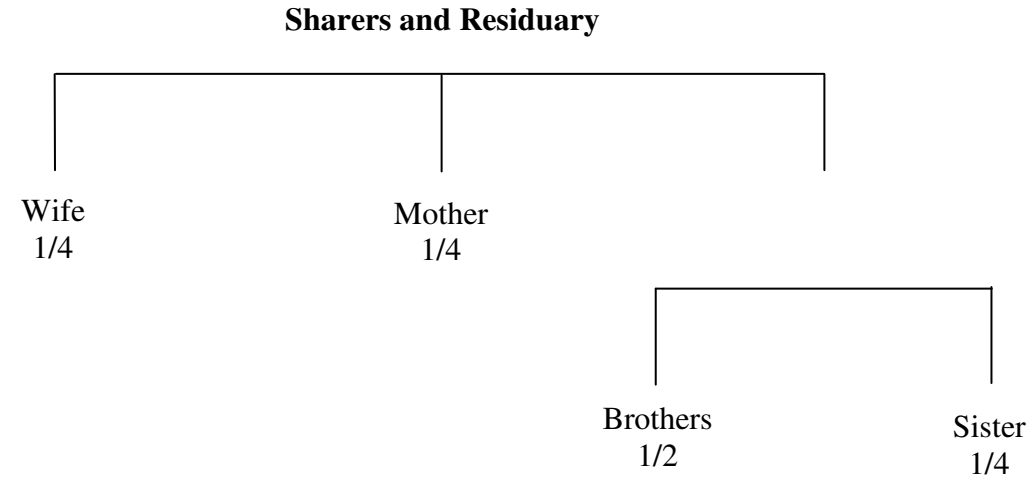


Figure 5.8: Share of Full Brothers and Sisters in the Case of no Entitled Descendants and Ascendants

Source: Own Presentation

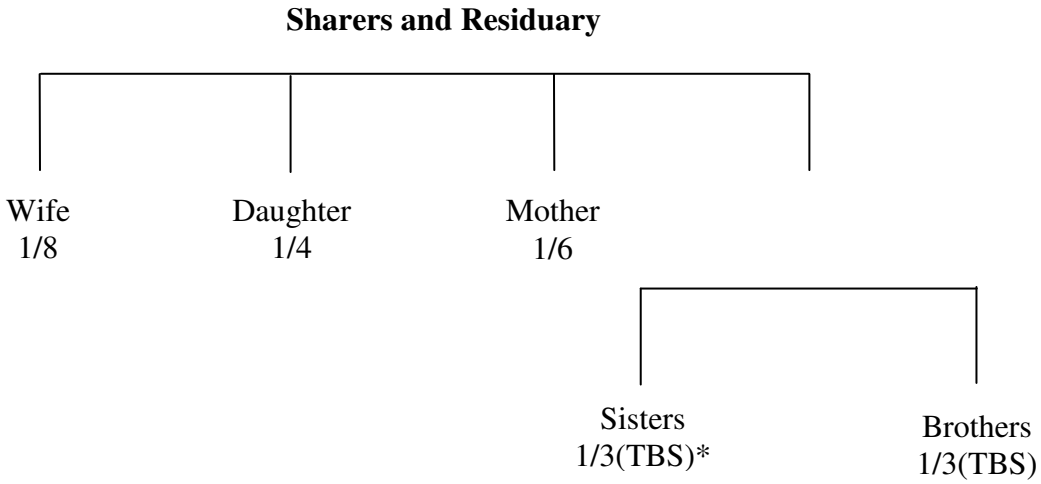


Figure 5.9: Share of Full Brothers and Sisters in Case of no Male Entitled Descendants and Ascendants

Source: Own Presentation

* TBS = total number of brothers and sisters

The distribution among consanguine brothers and sisters is the same as that for full brothers and sisters, but in the case of uterine relations, if the deceased has only one brother or sister, his/her share will be one sixth, if the deceased has left no children. In the case of a daughter of

the dead man, his brothers and sisters will receive one third of his property, providing that he has no son and father.

Similarly, uncles and aunts are the next following heirs after the grandfather, just as the brothers and sister are next following to the parents, and any nephews and nieces are next following to the brothers and sisters, and so on. They can claim only in the absence of particular heirs. If anyone above them in the queue is available, then the property cannot be transferred to them.

If the deceased is female, then most of the distribution is the same, but some shares are different; for example, her spouse (husband) is the only sharer who receives half of her property, if she has no child, whereas in the case of children, his share is reduced to one fourth portion of his wife's property. Another difference is between the shares of the children, as a female can allot fixed share of her property as per rule of law to all of her children, even if their fathers are different. The third point of difference is in the share of brothers and sisters; in the case of only a single brother as an heir and no entitled descendant exists, then her brother claim for all of her property.

According to Pakistani Inheritance Law, one category of distant kindred is defined that is neither a sharer nor a residuary. These are those heirs who are entitled to the inheritance, providing that no sharer or residuary exists; for example, the daughter's children and their children and the granddaughters' children. Sometimes, the owner gives them some property during their life as a gift or leaves some share for them as a part of his will. According to the registration act, 1967, neither the gift nor the will are documents that need to be registered; indeed, most people make an oral will, which causes problems after their death, at the time of the distribution of property, and conflicts arise.

5.8 Land Reforms Related to Land Ownership

In 1947, at the time of the independence of Pakistan, the landownership structure was badly skewed, being based on many small-scale farms and a small number of very large estates. Twenty five percent of the total agricultural land was covered by less than one percent of the farms, which were owned by big absentee landlords who contributed little to the production, and most of their land was ignored and uncultivated. At the other extreme, only fifteen percent of agricultural land was owned by about sixty five percent of the farmers, with a holding of

even less than five acres. These two extremes generated two poles in society: one was the landlord elite with their political power, and the other was poor and uneducated farmers.

In this situation, the government recognized the need to standardize the farm size and secure the rights of landowners. For this purpose, in the land reforms of 1950s, provincial governments tried to pass a bill relating to the absentee landowners, but they had little success in the face of strong opposition and because of this, an atmosphere of uncertainty was created in the countryside and intensified the animosity between wealthy landlords and small farmers.

During the era of Ayub Khan, a special commission was formulated for the betterment of the agricultural sector, and as per recommendations of this commission, the government issued new land reform regulations in 1959. This commission suggested a maximum farm size with a ceiling of about four hundred and ninety four acres (two hundred hectares) of irrigated land and nine hundred and eighty eight acres (four hundred hectares) of non-irrigated land, for an individual owner. In the case of the small landholders, the government considered an average holding of twelve to thirteen acres (about five hectares) necessary for a family's subsistence, and if a family had about sixty acres, then that family was considered as an economically stable household. The government allowed the transfer of extra land to the family members, and because of this exemption, slightly less land was surrendered. The land reform regulations made no serious attempt to break up large estates or could not reduce the power of the landed elite. However, these reforms were helpful to reduce the poverty gap by defining upper and lower limits of the land, and by allotting more land to individuals (through parental property or by government allotment), the risk of land wastage, mismanagement, and fragmentation of farm plots was decreased.

According to the land reforms of 1972, the landownership ceiling was lowered to about twelve to thirteen acres of irrigated land and thirty acres of non-irrigated land in 1973. In the case of poor quality of land, the owner was allowed to keep more land for himself; similarly, if the owner had his own tube well and tractor, then he could claim twenty percent additional land for cultivation. The Bhutto government imposed some taxes and other charges and obtained some desirable results. Thus, in 1977, they further reduced ceilings on the private ownership of farmland to about ten acres of irrigated land and about twenty acres of non-irrigated land.

Currently, the land reforms of 1972 represent the latest regulations in Pakistan, and according to these reforms, no one can keep more than one hundred and fifty acres of irrigated

land; in the case of non-irrigated land, the limit is two hundred acres. Transfer among family members and others is allowed, but the rule of compensation charges for the landowners who surrender their extra land has been abolished (this was only pertinent in the land reforms of 1959).

5.9 Summary and Conclusion

Pakistan has adopted some legislation from the legal setup of the former subcontinent Indo-Pak. For land administration, various acts are present in Pakistani law: for example, the Transfer of Property Act 1885, Land Registration Act 1908, Land Revenue Act 1887, Stamp Act 1892, and Land Acquisition Act 1894. These laws were amended according to the needs of the newly born country and came into force just after the independence of Pakistan.

According to the Transfer of Property Act, the people are allowed to transfer their movable and immovable property to the other persons. Various conditions are defined for the person who is authorized to make such transfer. Similarly, the Land Registration Act provides the facility for the registration of the property for secure investment in the future. The Stamp Act helps to deal with legal matters in the absence of the owner through the power of attorney. The inheritance law helps in the distribution of assets of the owner on his death.

Although this whole setup of legislation is helpful for the people, it is extremely complicated, and generally people cannot understand it. Unawareness generates many problems, especially for those landowners who are poor and illiterate. They do not know about the legal requirements and the procedures to save their rights. Similarly, the land reforms are very old and are not greatly much supportive of the farmers and landowners with small farms or those having the problematic land.

6 Do Property Rights Matter for Land Degradation? Evidence from Selected Regions of Pakistan

6.1 Introduction

Land degradation is a serious problem in general and in particular in those areas in which people hold land as a joint property. The degradation of land causes adverse effects on the agricultural sector of the economy, including all other sectors that depend on agricultural production. This problem is intensified in those economies in which agriculture shares a major contribution in GDP.

The theoretical literature provides various reasons for land degradation (Section 2.3). The major reason is the inefficient and unsustainable management of property by landowners (see, for example, Irshad 2008: 2; Banglapedia[38] 2006: 1). The inefficient management of land is especially significant when the land is mutually owned, and the work burden is unequally shared (see, for example, Rarieya 2009: 20).

Another important factor for land degradation is ongoing inter-family conflicts that are caused by ownership issues. Undistributed, orally distributed, and transferred lands act as the roots of serious conflicts, especially in the absence of well-performing institutions. For instance, Applegate et al. (2001: 36) notes that the burning of crops is based on land ownership conflicts; similarly Nyong and Fiki (2005: 4) point out that water conflicts are related to ownership conflicts.

In the presence of poor institutions, land property rights are over-exploited, and there is a need to understand the relationship of the individuals to their property. The lack of well-implemented property rights creates many problems, including land degradation. Therefore, well-defined ownership rights are crucially important for the efficient use of resources (Pamir and Pamir Alai Mountains (PALM)[39] 2010).

The existing literature on the relationship between land degradation and property rights has mainly focused on the issue of land fragmentation (see, for example, Dejene 1997: 37). These studies have demonstrated that small pieces of land as a consequence of land fragmentation cause the over-utilization of the land, which in turn reduces soil fertility and increases land

[38] National Encyclopedia of Bangladesh
[39] PALM is the sustainable land management in the high Pamir and Pamir Alai Mountains (GEF/UNEP/UNU project).

degradation. Another factor that causes land degradation is large areas of land-holding; Niazi (2006) provides evidence for Pakistan, showing that large sizes of land-holding cause the underutilization of land. The role of property rights has been examined by (Larson and Bromley 1989: 235, Sáez 1997, 3; UNDP/UNEP/WB/WRI 2002.). These studies provide evidence that the improper implementation of property rights is a crucial factor that causes land degradation and discuss property rights such as alienation and distribution; however, they consider intergenerational distribution of land is conflict-free.

Despite the vast body of literature involving examinations of this issue, as far as I know, none of these studies incorporates the conflicts that occur between family members from the distribution of land. This Chapter takes explicitly account into family conflicts associated with land distribution. Furthermore, it asks whether property rights matter in shaping the link to a selected region of a developing country, Pakistan, with regard to one hundred and fifty households in three regions. This analysis is relevant because it provides micro level evidence for selected regions of Pakistan that are lacking in the current literature on the theme in this country. To test the hypothesis that a relationship between land degradation and land distribution rights, inheritance laws were investigated and the following research questions were posed. What are the impacts of land distribution rights implemented on land degradation in selected regions of Pakistan? Do these laws cause land degradation?

The remainder of the discussion is organized as follows. Section 6.2 mentions theoretical considerations related to the issue and briefly discuss land property rights and inheritance patterns observed in the region. In Section 6.3, the results are further discussed on the basis of theory, and finally in Section 6.4, a summary of the results is given.

6.2 Theory

The constitution of Pakistan allows right-holders to deal with their property at their own discretion. The distribution of an estate is also related to the property rights of the owner, as future security and the well being of the survivors are dependent on the distribution of the assets of the deceased. The problem of the intergenerational distribution of the property after the death of the owner is characterized as a bargaining problem (See Section 3.5) according to the distributional theory of institutional change presented by Knight (1992: 168). The main concern of this theory is to deal with the distribution of the estate of the parents, but because of power asymmetric characteristics, a clear effect on the different relationships was observed

during the study. Everyone wanted to receive a maximum share in order to secure his future and to achieve a better economic position, and because of these various issues, conflicts arose between the heirs with respect to the issue of land distribution.

Similarly, in this chapter, the different groups of land owners have to be considered in the assumption of land-use rights. The issue of sustainable use and the conservation of land is directly related to its management; Bromley's theory of property regimes (1991: 22) explains the different management regimes for natural resources on the basis of rights allotted to the users (See Subsection 3.2.4).

Although, in Pakistan, land ownership rights are well defined, these rights are not taken up fully in practice, particularly in the investigated regions. Together with this improper implementation, some rights have loopholes, which may impose problems in land use and cause land degradation. I have checked these loopholes and found a relationship between property rights and land degradation, which is in agreement with the power distribution theory of Knight (1992). These issues are related to land distribution (Knight 1992). This chapter analyzes these problems in the case of family property and the distribution of the land among heirs for the study region.

Inheritance law in Pakistan is based on Mohammedan law, and according to this law, most of the primary level heirs are sharers and have a fixed ratio in the property. However, the anomalies of other laws (See Section 5.7) support the power theory of Knight; for example, a will does not need to be registered during the life of the testator, and any other person can present the will after his death. A person, who is influential and has income resources other than the land in question, can easily shift the decision of the distribution of the property in his favor.

The actual process of the transfer of property is time-consuming and requires legal contracts plus the outlay of costs known as “transaction costs”. Various authors have explained that individuals always want to reduce their costs (Bromley 1991, Alchine and Demsetz 1972), and so most people avail themselves of the facility of oral transfer of the property to avoid the long and complex system of registration that is implemented in Pakistan. Similarly, family compromises are also not legally documented, and in the case of partition, any document that is acceptable by an official of the revenue department is considered legally binding. These loopholes also create many problems in cases of the distribution of property (Alston et al.1999) and help the influential actor to obtain the favors of officials.

Power of attorney (See Section, 5.5) which also does not need to be registered in every case, further creates problems if a person who executes that attorney is socially and economically weak in his relationships. Similarly, cases of irregular sales are a common example of power asymmetry. Sale agreement can easily be exploited because of unawareness of the law, and so most people, who have a power of attorney over someone's property or who own common property, try to sell the land by establishing themselves as being authorized to carry out the sale. These are all frequent examples directly observed in this study.

6.2.1 Land Property Rights in Pakistan

In Chapter 5, land property rights in Pakistan have been thoroughly explained. Some landowners possess official documentation for landownership, which is known as registry in Pakistan, and this documentation gives them legal rights. However, in the study regions, as per survey results, most of the land has been orally transferred from one generation to the next, and the documentation was very old. Land distribution and land transfer among heirs has not been properly managed, which eventually causes serious problems, land degradation being one of these.

For this chapter, in order to analyze the situation of land degradation, it was important to investigate land distribution rights for the heirs; this analysis was helpful in answering the main research questions. In this context, the questions to be answered were: 1) Is the land to be distributed among the heirs? 2) In case of distribution, is land to be transferred to the actual landowner or to someone else authorized for the use of the land? 3) What sort of conflicts are evolved in the regions because of the improper implementation of land distribution laws?

6.2.3 Inheritance Patterns in the Study Region

The hereditary system is based on Islamic inheritance law[40]. People of this region in Pakistan believe in the traditional and cultural family system, which is comprised of father, mother, and children (and in the case of marriage, families of sons), who all live in one house (unit of analysis). On average, a household consisted of ten members in this region, with a family structure as shown in Figure 6.1. In some cases, other family members such as mother, brothers, or unmarried sisters of the father were also living in the same house.

[40] Islamic Inheritance Law is explained in Chapter 5.

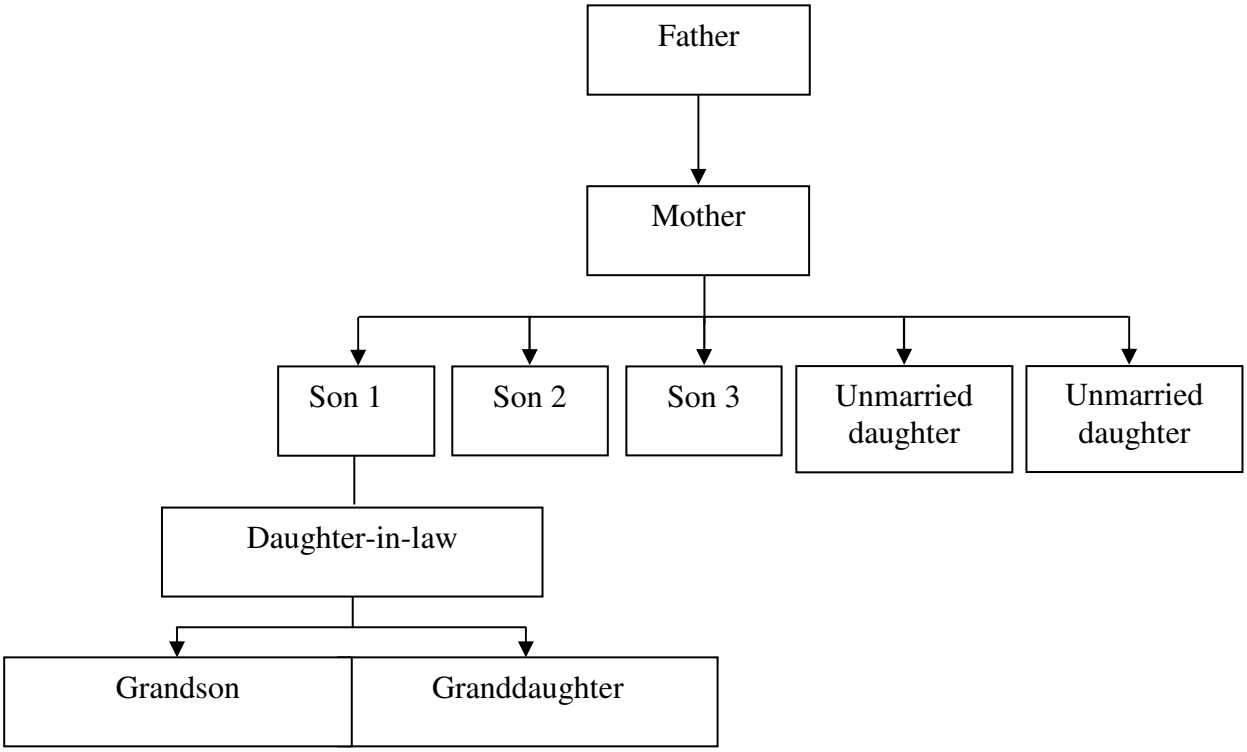


Figure 6.1: Standard Family Unit with Five Children, in which one Son is Married
Source: Own Presentation

Generally, the father played a significant role with respect to the well-being of his family unit and was responsible for fulfilling all the needs of his house. For this reason, he was considered the head of household and, in his life could own the entire property by himself. During the survey conducted in the region, various inheritance patterns were observed. In one third of visited household, land was transferred only to the eldest son, because of family traditions, as they considered that, with the distribution of the land, the family would lose its power. Another pattern was found again in one third of the households, where land was transferred orally, and in practice, the land was handed over to the eldest son or some other senior member of the family to look after. In this distribution, all shareholders had knowledge of their shares, but they were not able to use their rights, as they had made some family compromises, as per the culture of the family. Some other patterns were also observed, where landowners were enjoying full rights.

According to the Stamp Act, 1899 (see Section 5.5), the some registered landowners particularly females, who were culturally bounded and were not able to perform legal different tasks, enpowered the attorneys as an agent to act on their behalf. Other inheritance patterns are explained in Figure 6.2 and 6.3. In Figure 6.2, all the living sharers among which the property is distributed are shown; the mother and the spouse of the deceased are also alive and have received their share of the property as per the rule, but they have distributed their share among their offspring. Hence, mathematically, the distribution of shares can be presented as below.

If the deceased has five children, e.g., three sons and two daughters, every sharer can receive the following fixed shares from his estate.

Share of the spouse = 1/8 6.1

Share of the mother = 1/6 6.2

For the share of daughters and sons, the ratio is 2:1

For five children 2+2+2+1+1= 8 6.3

Share of each daughter = 1/8 6.4

Share of each son = 2(1/8) = 1/4 6.5

The widow and the mother of the deceased distributed their shares among their heirs. As per the law, the sharers in the widow's property were the children of deceased, and as a mother, she could give her share to her children. Similarly, the deceased mother distributed her share among her legal heirs who are her children and children of the deceased (grandchildren can only receive their father's share in the property of the grandparents providing that their father is died). An explanation of property distribution is given in Table 6.1.

Table 6.1: Common Practices of the Distribution of the Property

List of the persons involved in distribution of the land	**Sharers with a fixed share**				
	Spouse	Mother		Children	
				Son	Daughter
Shares of everyone in deceased property	1/8	1/6		1/4	1/8
Division of spouse share	-1/8			1/32	1/64
Division of mother's share		-1/6			
		Son	Daughter		
		1/24	1/48		
Share of deceased children in grandmother's property				1/96	1/192
Total share of everyone	0	1/24	1/48	7/24	7/48

Source: Own Presentation

In this situation, for the distribution of one third of the portion of the property, no written will was available in most cases. For all such cases, the whole property, after the removal of funeral expenditures and debt due from the deceased, were to be distributed between shareholders as shown in Figure 6.2.

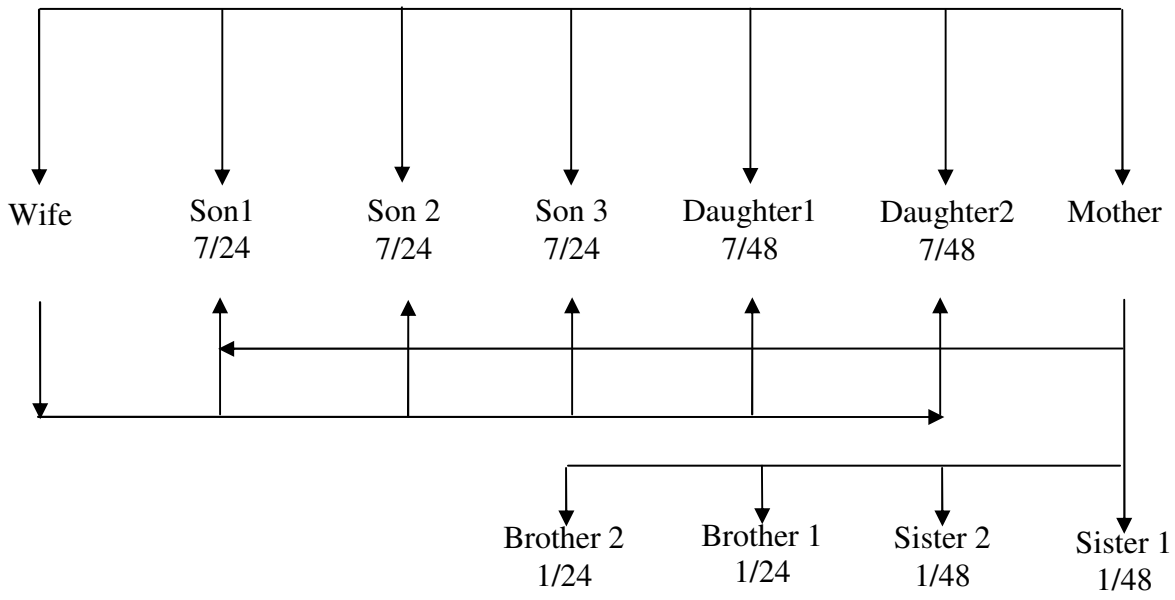


Figure 6.2: Share of Inheritance in Case of Redistribution of Widow's and Mother's Share

Source: Own presentation

In Figure 6.3, another observed situation is presented, which was quite common in the study areas. In this situation, the eldest son had died, and his share was distributed to his orphans, but these orphan grandsons were not the sharers in the property of the mother of their grandfather. Hence, the share of grandchildren was reduced to 9/32, and as per the rule, this was distributed between the brothers and sisters at the ratio of 2:1. In this case, the granddaughter would receive 3/32, and the grandson's share would be 6/32.

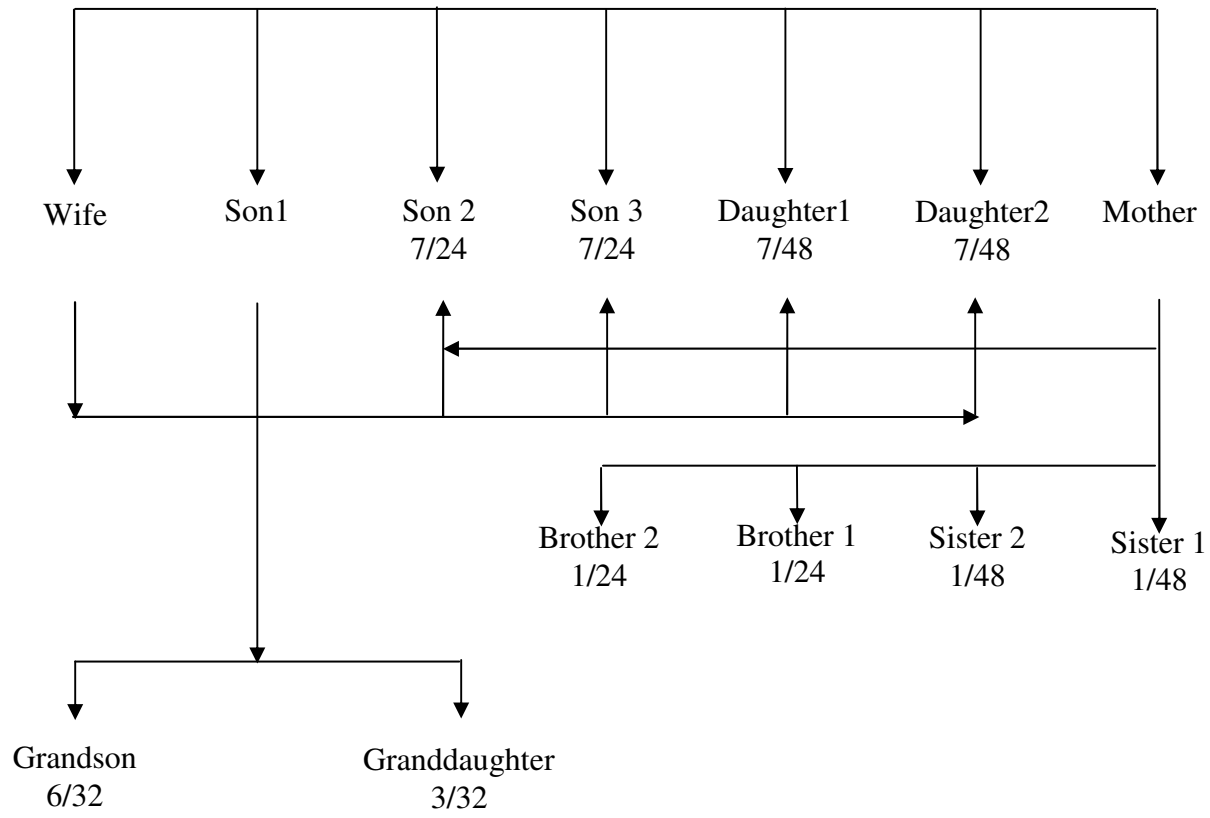


Figure 6.3: Share of Inheritance in Case of Redistribution of Widow and Mother's Share and one Son is also Died

Source: Own presentation

Some of the landowners of the region reported that they owned smaller than average size plots after the distribution of estate among the heirs of a large family. Culture of the joint family in the region promotes family compromises and arrangements. The main intention of these compromises is to avoid disputes in the family, but severe conflicts related to land distribution and land transfer were observed between the family members during the survey. These created problems not only in the relationships between family members, but also had effects on the fertility of the soil, as crop burning and water dispersal were common results of conflicts between different shareholders.

6.3 Results

6.3.1 Land Distribution among Heirs

In most of the families, land was not distributed in a proper way, the land still being registered in the fathers or even grandfather's name. These families had availed themselves of the facility, provided by law, that a 'will' could be executed at any time after the death of the testator. Initially, family members were made to comprise and, according to the family traditions, allowed one of the family members to take charge of the estate. Generally, this member was eldest living son, who established himself as being authorized to look after the property. In the Shaikhupura-Kamoki region, fifteen households were found in which their land had not been distributed at all. In Qadirabad Dam region, the number exceeded twenty, but in Nandipur region, this number was lower than that in the second region, and only fifteen households were found who had not distributed their land (Table 6.2).

Table 6.2: Number of Households according to Land Distribution and Control over Land in the Study Regions

Situation	SKR	QR	NR
Land was not distributed at all	15	20	15
Land was distributed, but not yet transferred to actual owner as partition was made orally	15	19	15
Land was distributed and actual landowner had full possession	20	11	20
Total number of visited households	50	50	50

Source: Field Survey (2008)

Another common situation was that distribution had occurred according to the oral transfer of the property. Through this distribution, landowners were awarded some specific rights, mainly to cultivate their land and to look after it, but they were not allowed to sell their land, because it had not been legally transferred to them. In this case, documentation was either very old or some of the members had obtained temporary documentation from the local patwari for the

partition. These types of distribution cases numbered thirty percent in the Shaikhupura-Kamoki region, thirty eight percent in then Qadirabad Dam region, and again thirty percent in the Nandipur region (data shown in Table 6.2).

In these regions, only a few households were found who were enjoying full land rights, as land was not only distributed, but the landowners had full possession of their land. In these cases, the landowners had their complete documentation with a new cadastral document signed by the sub-registrar. These cases involved forty percent, twenty two percent, and forty percent for visited households in each region as presented in Table 6.2.

Table 6.3: Results of Land Distribution Structure on Land Degradation for all Study Regions

Variables	Estimated Coefficients	t values
Results for SKR		
Constant	150.76	4.55*
Land distribution (L_{dis})	-55.90	-3.38**
Transfer of land ($L_{T)}$	-11.43	-2.06**
Results for QR		
Constant	113.78	3.40**
Land distribution (L_{dis})	-28.26	1.71***
Transfer of land ($L_{T)}$	-19.63	-3.20**
Results for NR		
Constant	12.01	4.05*
Land distribution (L_{dis})	-2.60	-1.77***
Transfer of land ($L_{T)}$	-0.88	-2.52**

Source: Field Survey 2008

* Significant at level 0.01

* Significant at level 0.01

** Significant at level 0.05

*** Significant at level 0.1

Mainly these regions were selected on the basis of the degree of land degradation; the Shaikhupura-Kamoki region was declared as a medium-level degraded area on the basis of soil fertility. Similarly, the Qadirabad Dam region was a highly degraded area, and the Nandipur region was a less degraded area. To determine whether the intergenerational land distribution and transfer of land among heirs was the reason for land degradation, a regression analysis was performed, which gave the following results expressed in Table 6.3.

These results showed that the variable of land degradation regressed on other two variables; one variable being 'intergenerational land distribution' and second one being 'transfer of land among all heirs'. All the estimated co-efficients established that these variables are significant for causing degradation of land in all three regions, and so the hypothesis that 'land distribution among heirs is also a reason for land degradation and causes bad effects on the land' can be accepted. Negative values of estimated coefficients show the inverse relationship of the dependent and independent variables, which mean that more land will be degraded following further improper land distribution and a poor land transfer structure in the region.

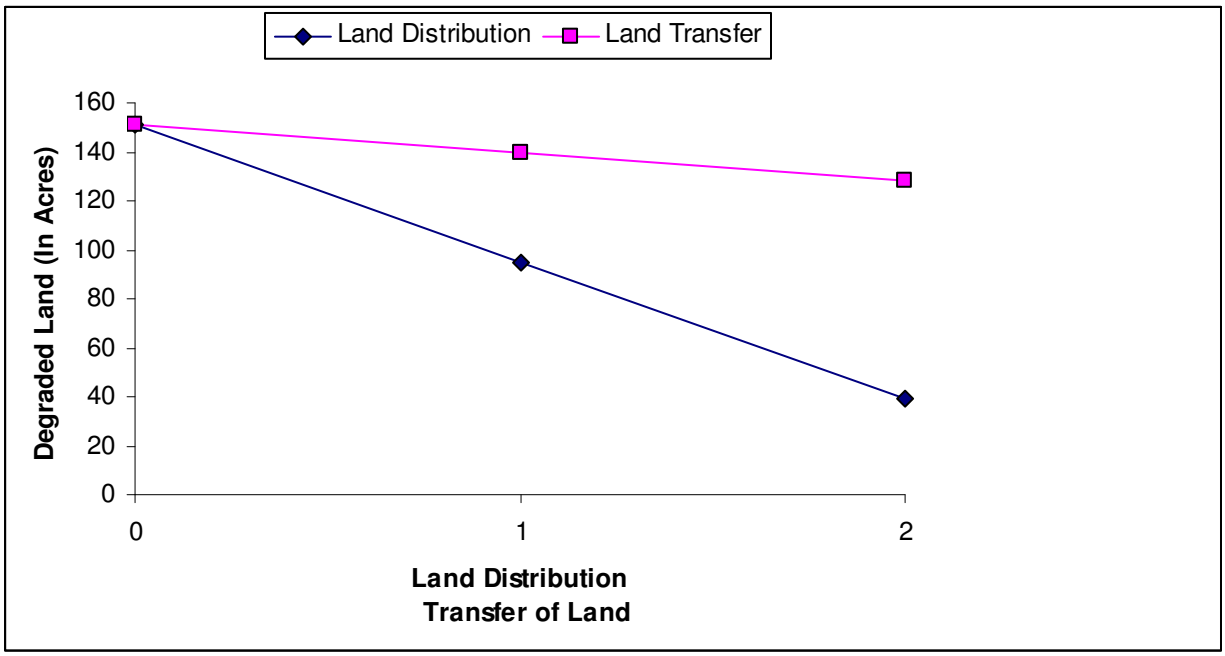


Figure 6.4: Relation of Land distribution and Transfer of Land with Land Degradation in Shaikhupura-Kamoki Region

Source: Own Presentation, field survey 2008

Figure 6.4 depicts the relationship of land distribution among heirs and the transfer of land with respect to land degradation in the Shaikhupura-Kamoki region. The steeper line of the land distribution with a negative slope of value 55.90 shows that the land distribution in this region has a strong effect on the land degradation, whereas the more flattered line of the land transfer of value 2.06 means that this variable is significant but comparatively less effective. Here, the value of R^2 is 0.34, indicating that thirty four percent of the variance of the observed data was well explained.

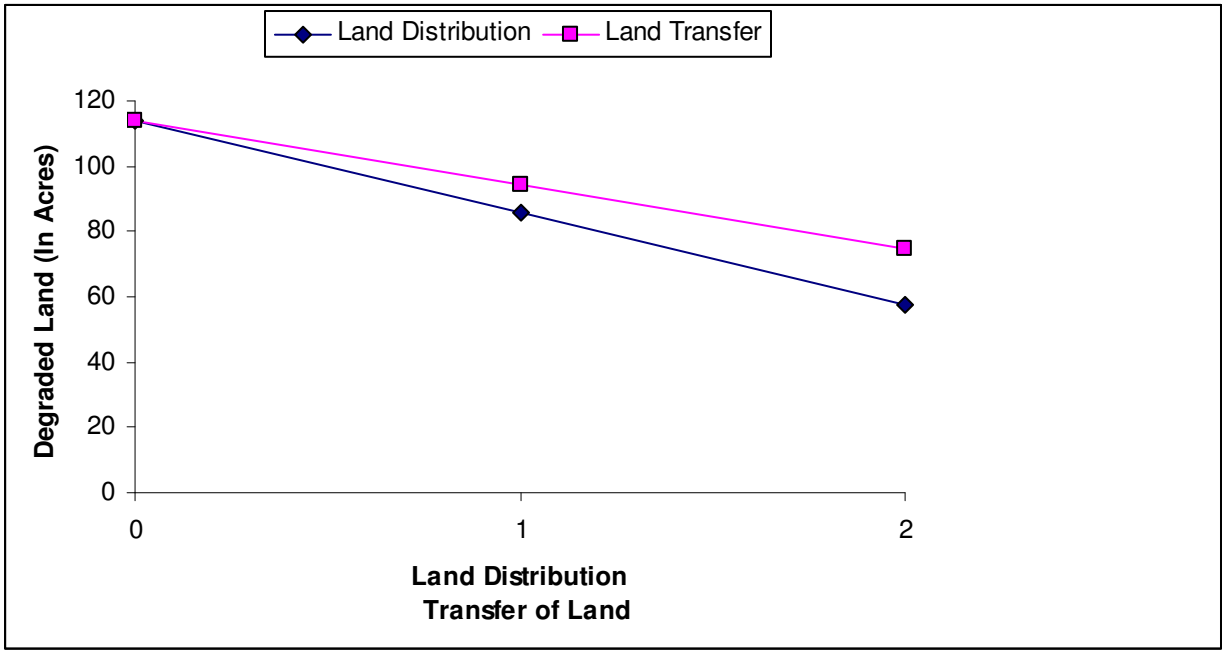


Figure 6.5: Relation of Land distribution and Transfer of Land with Land Degradation in Qadirabad Dam Region

Source: Own Presentation, field survey 2008

Figure 6.5 reveals the same relationship of land degradation with the two independent variables, viz., land distribution and transfer of land among heirs from one generation to the next, for the Qadirabad Dam Region. The trend is again negative, which is in agreement with the hypothesis of this study; however, the values of the slopes for these two variables in this region are different from those of the previous region, as here the value of the slope of land distribution is 28.26 and the value of the slope for transfer of land is 19.63. These results indicate that both the variables have an effect on land degradation, but that the land distribution is significantly less effective on degradation with significance at the ninety

percent confidence interval, whereas the transfer of land shows significance at the ninety five percent confidence interval and is more strongly related to the dependent variable than in case study region SKR. In this case study region, the value of R^2 is 0.324, which shows that, in this case, the variance of observed data is less well explained than in the previous case.

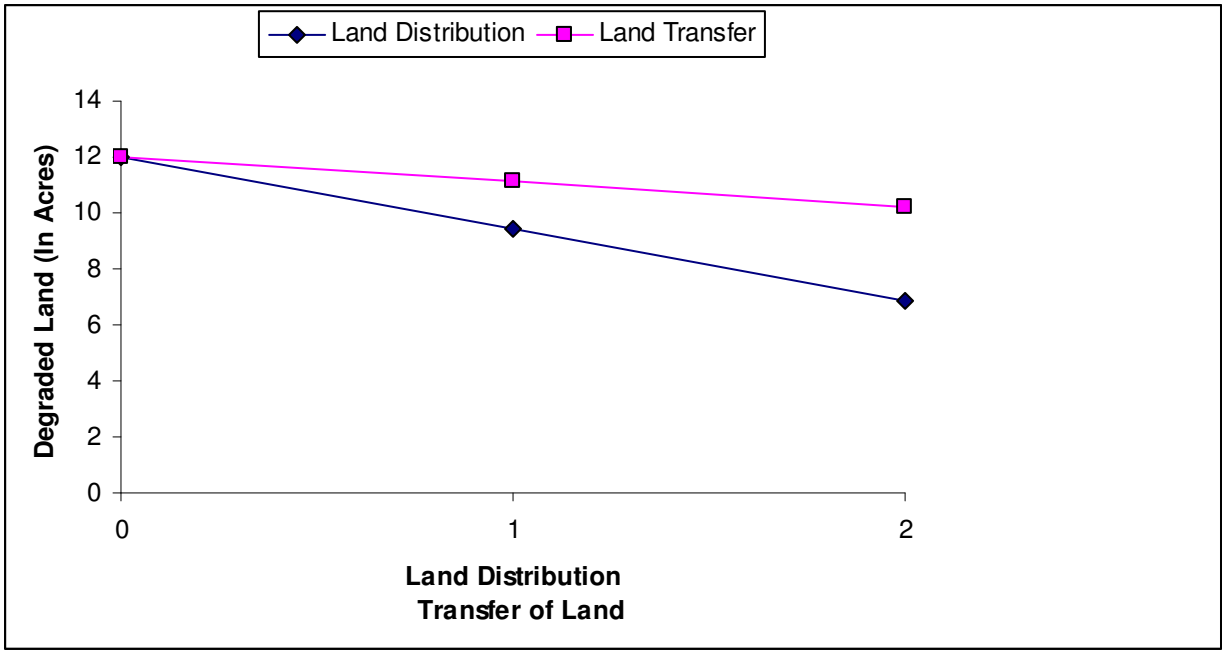


Figure 6.6: Relation of Land distribution and Transfer of Land with Land Degradation in Nandipur Region

Source: Own Presentation, field survey 2008

As in above two relationships, Figure 6.6 demonstrates the negative relationship of land degradation dependent on land distribution and land transfer for the third case study region, but here these two variables show a weak response in comparison with the previous two cases. In this case, the value of the slope of land distribution is 2.60, and the value of the slope of transfer of land is only 0.883, with R^2 also being as low as 0.122, indicating that only twelve percent of the variance is explained, and the data are much scattered. Scientifically, these weaker results show that the land degradation in this region is also caused by other factors, which have been considered as being constant for this analysis.

These results clearly indicate that the land distribution and transfer of land among generations play a significant and important role in the sustainability of land use. These results can be explained with the help of the ownership structure in Figure 6.7. In the first category,

the land is not distributed, and the families prefer to live together; as per family traditions, the eldest son or other senior member of the family (uncle) is the custodian of all the estate. In this case, the management of a resource is very important. According to Bromley's definition, resource management is a structure of rights and duties between different individuals with respect to that particular resource.

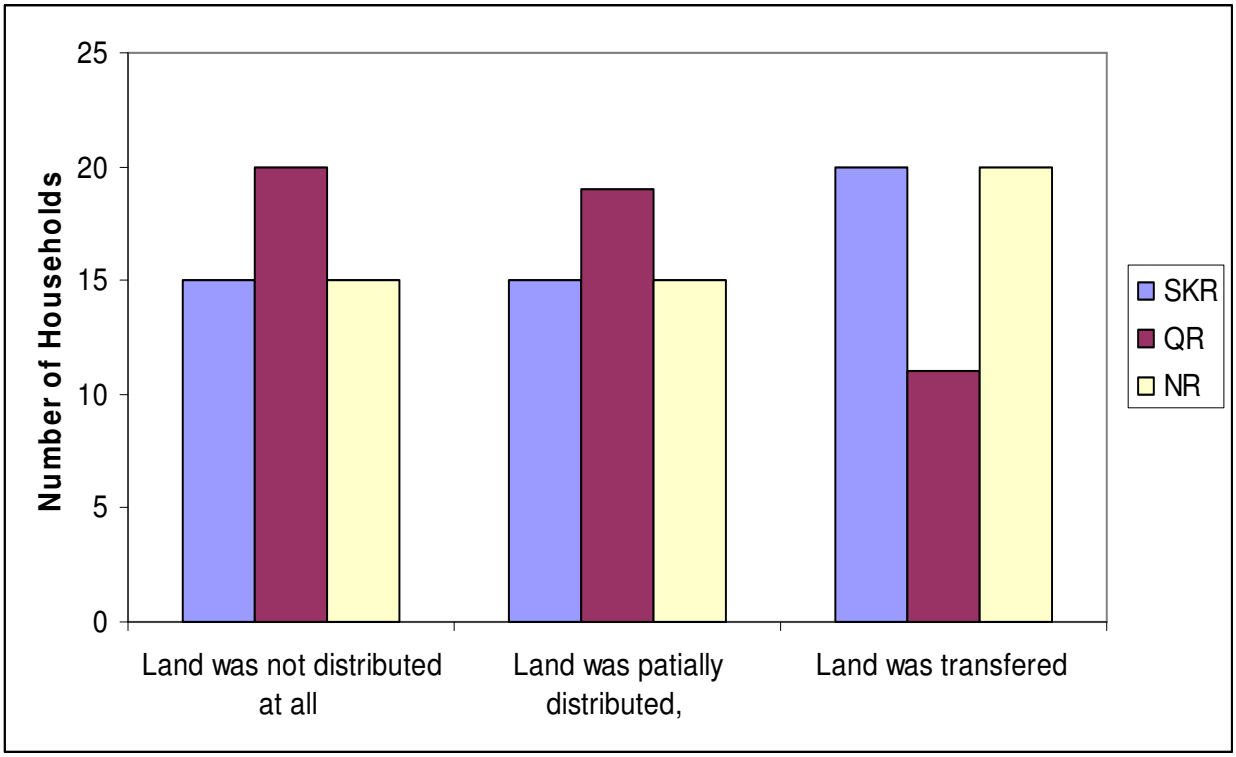


Figure 6.7: Pattern of Land Distribution in Study Regions

Source: Own Presentation, field survey 2008

Extensive use of these combined agriculture farms to fulfill the needs of an extended family has caused deterioration in the quality of soil, and because of the production of specific yields of the mono-cash crops to increase gains, the land has started to lose its productivity. The excess use of fertilizers and pesticides is another reason for the reduction of soil fertility in the region. The care taker is looking only for immediate benefit and ignores the future loss of the land (Cropper 1988: 13). However, because of the negligence of actual owners, they had to cost in the form of land degradation.

In the second case from Figure 6.7, the land was distributed, but this transfer was oral, and every shareholder knew his share in land. He could cultivate his land by himself but was still bound with respect to other rights, such as alienation, sale, and future transfer to some other

person in the family. The majority of households had documents of partition, which they had obtained from the local patwari. This is a type of kinship group, and according to Larson and Bromley (1989: 237), the owners have some restrictions placed upon them by the other family members or the other owners of the land, and so in this case, the resource is degraded because of insufficient property rights. The main reason of the degradation in this case is the behavior of the group members, as they are unable to act in a socially responsible manner; they blame each other for the low cooperation and coordination for cultivation of land (Demsetz 1967). No one is willing to accept the authority of anyone else and attempts to make himself as well-off as possible, without taking care of the welfare of other family members. Eventually, a reduction in the efficiency of soil and productivity of land results.

In the third case of Figure 6.7, each landowner had full rights with complete control over his land. This was the case of private property, and according to the literature, the private property regime gives the best results for resource conservation, because of its specific characteristics of management, the decision-making power of ownership, better investment planning, better time utilization for crop cultivation, and improved knowledge about crop rotation. However, sometimes, the owner cannot save his land from the degradation occurring as a result of other effects; for example, as in my study, the lack of input and investment, because of the poverty of the landowners, and their attempts to maximize current profits, with no regard for future resource conditions, are the major reasons for resource deterioration.

From the above discussion, the hypothesis presented in this study, “land distribution among heirs is also a reason of land degradation in the region”, can be accepted. These results show the land distribution effect is strongest in the region Shaikhupura-Kamoki. Although the results show almost equal trends, for further explanations together with the distribution and transfer details, the conflicts related to this issue have also been tested, and some important results have been found.

6.3.2 Conflicts Resulting from Land Distribution

Transfer of property in the next generation is necessary for the redistribution of wealth and the security of succession. However, most of the family members were not good at social relations at the time of distribution, and so transfer became crucial in the presence of such issues and caused conflicts of interests. During this study, various conflicts were observed between the landowners for a given pattern of land distribution (Figure 6.7). For the same

pattern of land distribution, another regression line was estimated for the three different regions, and here the respondent variable was conflicts on the basis of land distribution among the heirs, and the explanatory variable was land degradation in the region. The results of this are given in Table 6.4.

Table 6.4: Relation between Conflicts about Land Distribution and Land Degradation

Variables	Estimated Coefficients	t values
Results for SKR		
Constant	7.75	1.28
Land distribution Conflicts(C_{dis})	15.99	2.42**
Results for QR		
Constant	20.12	5.04*
Land distribution Conflicts(C_{dis})	17.34	3.53**
Results for NR		
Constant	5.05	21.58*
Land distribution Conflicts(C_{dis})	0.93	2.94**

Source: Survey 2008

* Significance level = 1%

** Significance level = 5%

According to the results given in Table 6.4, the conflicts related to land distribution had a strong effect on land degradation in the Shaikhupura-Kamoki region and in the Qadirabad region, but the value of QR is higher than that of SKR. In the third case study region (NR), the value effect of conflicts on land degradation was less than one but significant at ninety five percent confidence interval. From these results, not only the pattern of distribution, but also the conflicts that arose on the basis of this distribution are also clearly significant and

play an important role in land degradation. The value of R^2 is maximum in the Qadirabad region, at 0.206, and its value is 0.109 and 0.094, respectively, in the Shaikhupura-Kamoki region and the Nandipur region. Thus, in QR, the data related to land distribution conflicts is well-explained compared with the other two regions.

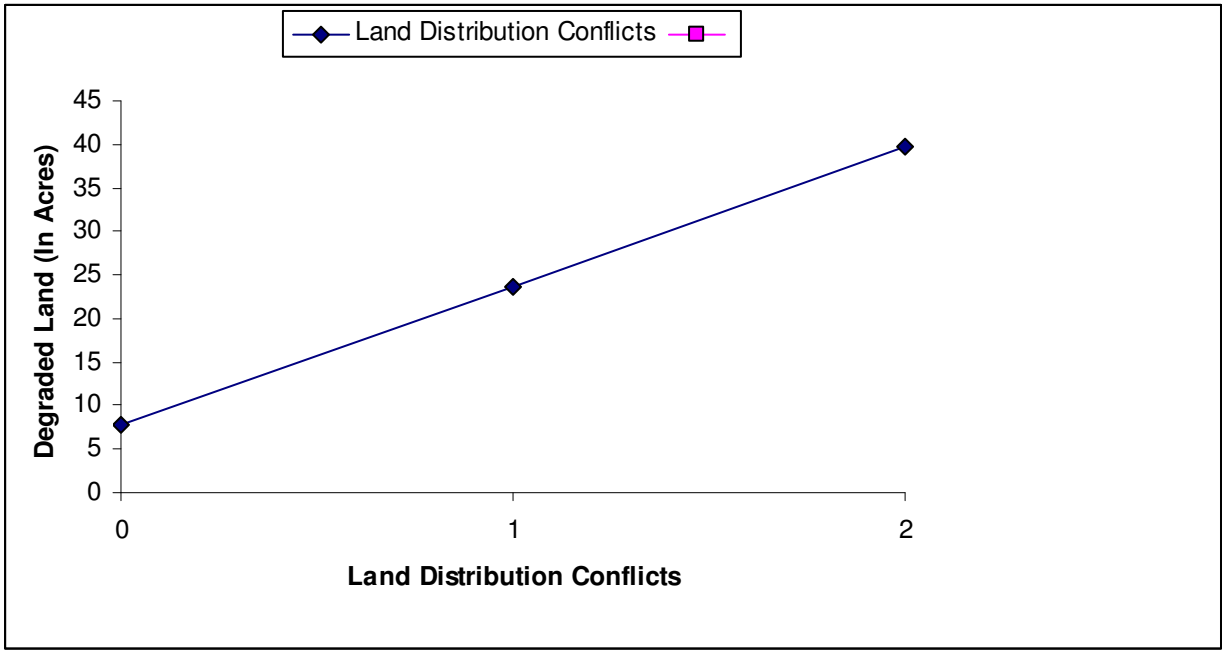


Figure 6.8: Relation of Land Distribution Conflicts with Land Degradation in SKR

Source: Own Presentation, field survey 2008

This positively sloped line in Figure 6.8 shows the relationship of land distribution conflicts and land degradation in the Shaikhupura-Kamoki region, with a value of 15.99. This relationship reveals that, with an increase in conflicts between household members related to land distribution, the land degradation will increase in the region. The same trend is found in Figure 6.9 and Figure 6.10 for the other two regions, with different slopes at 17.34 and 0.93. These results show that conflict is also one of the reasons for land degradation. These results demonstrate that the effects of conflicts related to land distribution are stronger in QR than in the other two regions. The value for the third region is quite low, being less than one, and this small effect is also significant for land degradation at ninety five percent of the confidence interval; thus, we cannot ignore this nominal effect.

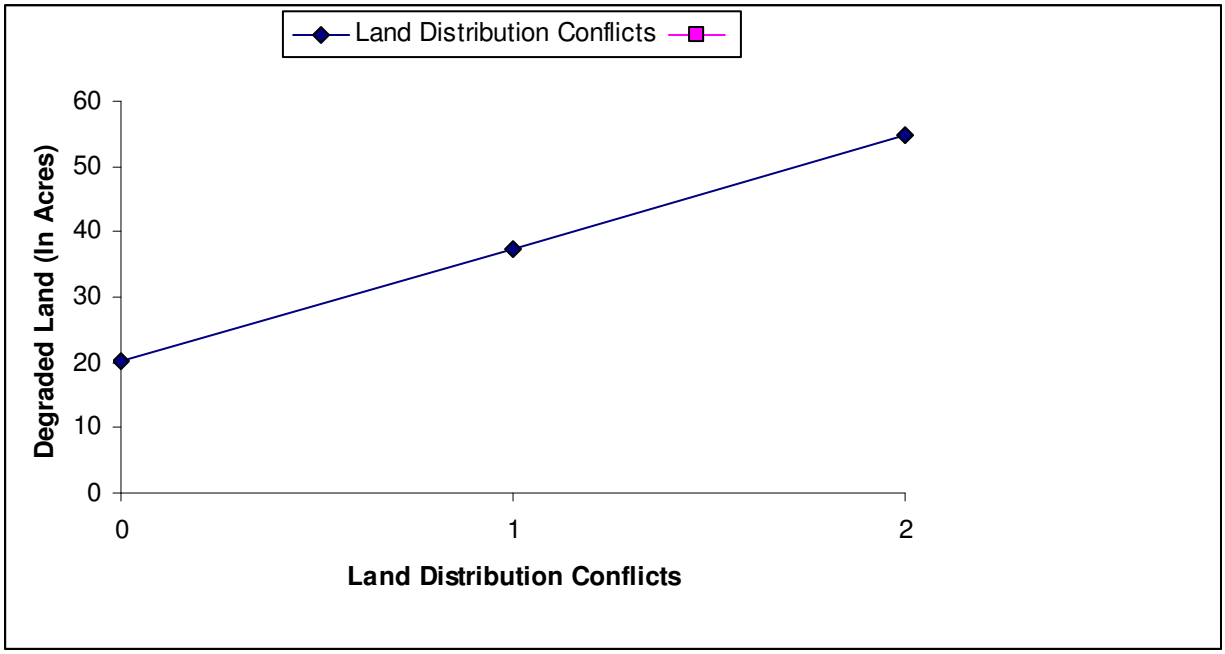


Figure 6.9: Relation of Land Distribution Conflicts with Land Degradation in QR

Source: Own Presentation, field survey 2008

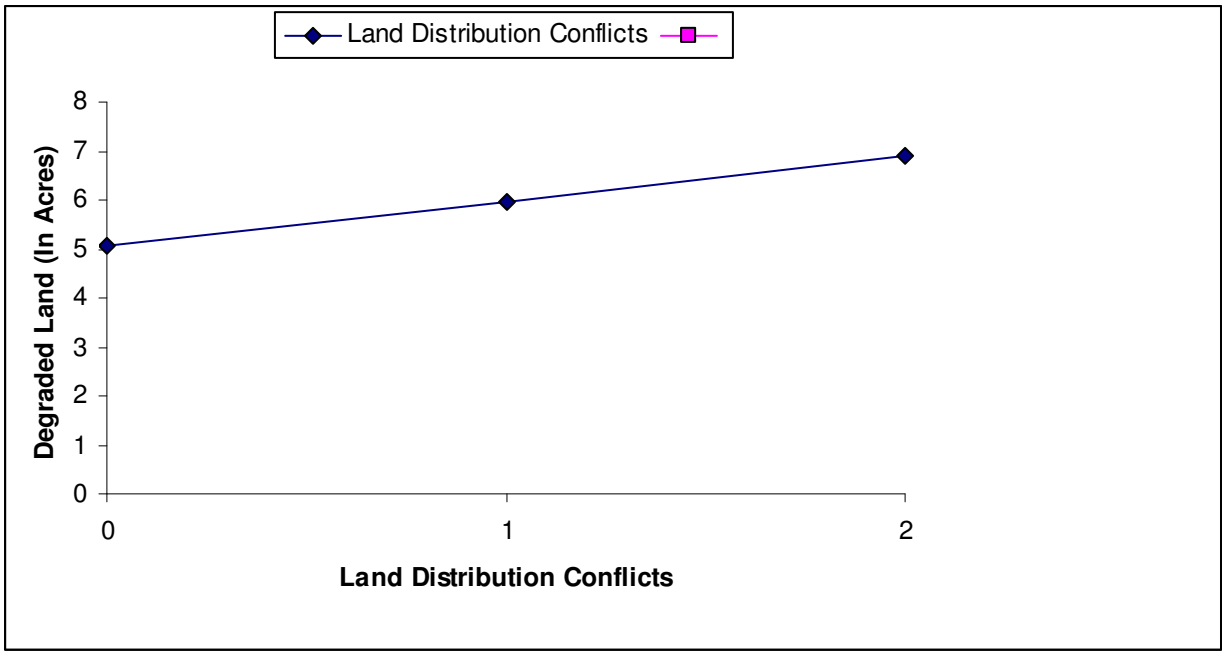


Figure 6.10: Relation of Land Distribution Conflicts with Land Degradation in NR

Source: Own Presentation, field survey 2008

In households in which the land was not distributed (Figure 6.7) and all matters were dealt by one person, second respondents[41] reported that, as they had no rights to use their land, they could not cultivate it according to their own will, they had no idea of the income generated through these farms, and they did not even know the annual production of this land. They complained that this was the fault of the monopoly of the care takers, who controlled all of the estate and its resources and used all their rights in order to keep absolute power over the land that they managed. These second respondents related that they wanted to exercise their rights over the land, and hence, their families should be forced to distribute the land. They also said that their first priority would be to cultivate the land, but that if land condition did not allow them to do so, and they would get a better return by selling up, then they would do so. The first respondents argued that land was a sign of their prestige and power, and that they did not want to distribute their power; in the case of selling up, others would then share their territory. Some respondents (R_1) answered that they had spent money on the marriage and other expenses for the other shareholders, and it was equal to the value of their land, and so now the others had no right to the land.

In the first case study region, the actors who had no rights to land (fifteen) tried to solve this matter through the family and then the nazims of the area, but because of the strong position of the other actors, they could not resolve the matter. Some examples are quoted in which the care taker sold the land, and because of the land-use change, the land was degraded. On asking for details of the conflicts, one of the respondents told me.

> "A plot measuring fifty acres was distributed between four brothers, namely Abdul Hameed, Manzoor Ahmed, Muhammad Saeed, and the respondent (Mustaq Ahmed) himself. The plot remained throughout in the individual ownership of Sadiq Ali Late (father of all shareholders). At his death, according to the family traditions, the property was transferred to the eldest son Abdul Hameed. He used the land for cultivation but did not inform other members exactly about income generated and the returns gained. After sometime, a building was raised on the side plot, and machinery was installed therein for rice processing, but this land-use change caused erosion, and the productivity of other parts of the land was also affected.

[41] As explained in Chapter 4, two respondents were selected from one household to reveal the exact situation of the conflict between the families.

> Abdul Hameed refused to accept his brothers' share in the property and claimed that he was the single owner of the land, as he had struggled to cultivate it. His brothers asked other family members to resolve this issue, but they did not achieve a satisfactory solution because of the strong position of Abdul Hameed within the family. The shareholders contacted the nazim of the union council and reported this matter. However, because of influential power of Abdul Hameed, the nazim also did not do anything."

The respondent also said that they could approach the Member of national assembly (MNA) of the area and ask him for justice, although the judiciary process takes too long, and they need immediate help to save their land. The respondents revealed a mix trend about selling their land, but most of them were in favor of agriculture.

In the second case study region (QR), where the land has poor agricultural qualities, the majority of households have already been shifted their business to other options, e.g., fish farming, despite the fact that the land has not been distributed. After this change in land use, they can achieve a good profit margin in comparison with the previous use. A distribution of land to other shareholders would reduce the area of the farm, which would eventually affect their returns. This is the main hurdle in distributing the land among legal heirs. On an investigation of the second respondents, most of them were interested in setting up other businesses by themselves, or, if they had a good offer for their land by an industrialist or housing societies, they would sell it.

In the third case study region (NR), where land is good for agriculture and is in production throughout the year, in those households (fifteen) where the land had not been distributed, both the parties were in favor of the cultivation of land, but the actors who had no rights wanted to be given some rights over the land; they wished to employ better techniques in order to increase the quality and output of their part of land and wanted to improve their lifestyle. In response to the question with regard to selling the land, the majority said they did not want to sell, but that, if in the future they are offered a better option involving land-use change, then they would consider that option.

In all these three cases, the main reason for the non-distribution of the land is the cultural and family tradition effect, which supports the asymmetric power of the custodian. He receives a greater share in the profit from land, which would be reduced if land was distributed. Thus, he is not in the favor of distribution. Both the groups (group of landowner$_1$

and group of landowner$_2$) argued that the selling of the land or land-use change is the motive of the other actor, which is a reason for land degradation.

In the case of the oral transfer of land, the shareholders make a compromise on the basis of joint cultivation but are unable to act as a socially efficient group, working for a unified purpose. Disagreement on any amalgamated decisions is the reason for conflicts and land degradation (Larson and Bromley 1989: 236). In such cases where land was partially distributed, i.e., the rights were transferred orally and partition documents were prepared by the local patwaries, the custodians were reported to use their power and their resources to gain more than their specified share in the land. They did this with the help of patwaries, who were responsible for the measurements and making partitions. These officials also knew about the actual share and the documents, but for their own benefit, they made a deal with landowners and allotted them more than their share by making some changes in the will and ferd malkiat.[42]

Some conflicts were extremely severe and registered in court for solution. A description of one case is given here as an example.

> "A petition was filed by the widow of late Abdul Majeed Bhatti, against the respondent Abdul Rashid, who was the brother of the deceased, for the partition of the estate in the village of Jundala, District Gujrat, on 23rd of January, 2001. She claimed her husband's 2/9 share from the joint property. She reported that suit property was owned by Muhammad Hussain Bhatti, who was the predecessor-in-interest of both the parties and died in 1985. After his death, the property was distributed among his six descendants (three sons and three daughters) including Abdul Majeed Bhatti, who died in 1999. According to this report, each shareholder son received 2/9 and each shareholder daughter received 1/9 of the property of the late Muhammad Hussain Bhatti. However, this was joint property, and everyone received partition documents (Fard Malkiat) from the patwari.
>
> After the death of Abdul Majeed, his widow claimed for his share for herself and his orphans, and the respondent refused to accept by saying that he had purchased the share of Abdul Majeed against some gold ornaments of the

[42] Ferd malkiat is the legal paper, issued by the patwari, which is the proof of the ownership of the land by one person.

> value of Rs. 50,000. He admitted that he had no written instrument regarding this sale, which is against the law, and according to the transfer of property act 1882 Section 5 and registration act 1908 section 17, the deal was not complete. To prove his statement, he produced the witness of his other brother and sisters in court in his favor. He also obtained some documents from the patwari, to strengthen his position.
>
> In 2010, the case is still with the court, with the question as to whether the plaintiff has come to the court with unclean hands or the respondent is guilty remaining unresolved. Who is the owner of the share of the late Abdul Majeed?"

In these regions, other conflicts (related to land distribution) causing land degradation were also observed; for example, because of the distribution of land, most of the conflicts, based on the issue of water use, were generated between baradri members. As in Shaikhupura-Kamoki region, some landowners reported that, at the time of distribution, a tube well was considered as the joint property of all shareholders, despite it being installed within the territory of only one member and internal watercourse (Khal[43]) passing through his plot. All shareholders undertook an unregistered agreement for the water usage and expenditure of electricity. However, most of the members holding the tube well on their land were not actually happy with this distribution and, because of their grievances, demolished the khal and stopped the water supply to other plots; this caused sodicity on most of the land in the region. Another reported reason for land degradation arising because of family conflicts was opponents burning each other's fields. This not only represented an economic loss for the landowner, but also had negative effects on the health of soil in the form of the loss of organic matter such as carbon and nitrogen, which are essential for the productivity of soil (Fasching 2001: 2).

In the Qadirabad Dam region, people reported that land-use change was one of the main reasons of conflicts. Other reasons were similar to those in the SKR, and all these actions caused land degradation. Similarly, in the Nandipur region, people reported the non-availability of water; this was an issue of conflict between the landowners. All three regions rely on underground water irrigation, and most of the land is cultivated through underground water via tube wells. Water provided by the irrigation system is not enough to meet the requirement of the area. The use of family tube wells to fulfill the requirement of the land is

[43] Khal is the local name of the internal watercourse.

itself problematic because of the bad social connections between family members; the cost of this conflict is the degradation of land.

In the third type of distribution, when the land was fully transferred, landowners also suffered from disputes related to land rights; mainly, these issues are based on the temporary transfer of power through contract. In this transfer, an attorney was appointed to look after the land on behalf of the actual landowner. In this category, various situations were found, as are detailed in Table 6.5.

Table 6.5: Various Cases Explaining the Situation of Powers of Attorney in the study Regions

Land Distribution	Why the landowners have transferred their land to others?	Contract
Land was fully transferred to the landowners and they had full possession of it	Landowner was in the village but was not able to look after his land	General/Special power of Attorney.
	Landowner was not in the village and worked elsewhere in the country	Special power of Attorney.
	Landowner was female and not able to deal with land matters	General/Special power of Attorney.
	Landowner was not in the village and had settled in another country	General power of Attorney.

Source: Field Survey (2008)

These types of the contracts in the form of powers of attorney have been explained in Chapter 5 under the stamp act. In the first case, in which the landowners were present in the village, they had given authority to a third party. This was the situation when these landowners were ill or were old but with no children. They transferred some of their rights according to the conditions of the contract. In the second case, the landowners were not present in the village and could not visit it frequently. They had kept only particular rights such as the right to sell the land, whereas all the remaining rights were transferred to the attorney. In the third case, the land owner was female, and cultural and societal boundaries did not allow her to deal with all matters, especially problems related to the court and all other legal issues. In the fourth

case, the landowners did not live in the country, and visited their place only for short periods after long time, and it was difficult for them to deal with their land while they were not physically present. They issued a general power of attorney and authorized another person to deal with all matters concerning their land including selling and purchasing. In most of the cases, these attorneys were other family members.

In the cases of power of attorney, the majority of the landowners reported that they suffered from frauds, especially where a specific land area was defined. The landowners revealed that the attorneys took additional land during the measurement of the area, aided and abetted by the patwaries, who are responsible for land measurement at the time of transfer. Some cases of non-payment of rent were also reported. Female executives reported that the attorneys in their case were mostly their brothers or brothers of their husbands, and they were not willing to leave the land once the contract was terminated. On the other hand, the attorneys, when questioned, argued that the landowners had transferred the rights to them, and that now they were the owners of the land. A description of one of these cases reported in the Lahore High Court is given below.

> "The case was filed in Lahore High court in 2006, under the registration act 1908 Section 17 and Subsection 47, under civil procedure code, by Moeen Akhter wife of Abdul Satter against the sons of her husband from his first wife. She sued them with regard to her property situated in Sahukimalian, in 1998, when she came to know about the fraud carried out by these sons.
>
> She had appointed her husband's sons as attorneys for general power of attorney for her plot with a size of twenty acres. The agreement was in writing, and, according to the agreement, all the payments from such property were supposed to be given to her. After some time, she observed that the agreement was not being executed as per contract, and that the attorneys were involved in selling, without any sale agreement with the owner. Considering herself to be a deprived owner, she sued for her rights in the civil court, but her suit was dismissed, because the opponents produced witness and documents not only for a sale agreement, which was not registered, but also proved that she had transferred her property to them, and that now they were the owners of that plot. She then appealed to the district court, the case presently being at the high court. She was still waiting for justice at the time of the survey."

During the survey, thirteen cases of conflicts were observed in the Shaikhupur-Kamoki region with regard to the transfer of power, of which eight were of sale, and the remaining five were of occupancy. Similarly, in the Qadirabad Dam region, five households reported the same situation, viz., that attorneys had sold their land, and in the Nandipur region, seven landowners were found who had problems with their attorneys (Table 6.6).

Table 6.6: Households with the Power Transfer Cases and Conflicts

Regions	Number of Households with full transfer of land	Number of Households, who had issued Power of Attorney	Households with Conflicts on the base of transfer of power	Type of contract
SKR	20	16	13	General Power of Attorney
QR	11	8	5	General Power of Attorney
NR	20	11	7	General Power of Attorney

Source: Field Survey 2008

The results in Table 6.6 show that, in all the study regions, the general power of attorney, through which the landowner gave all the rights to the attorneys as explain in Chapter 5, was problematic. This issue is common because the law is very complicated, even under normal conditions, and landowners do not know the exact terms and conditions of such contracts and are easy to exploit, because of this lack of awareness and their illiteracy. Landowners are mostly poor and poorly educated, and attorneys have strength on their side because of their resources and better knowledge. On being questioned, the majority of landowners reported that attorneys were not willing to leave the land, whereas the attorneys insisted that they were now the owners, because the landowners given this plot to them instead of their payment for acting as an attorney.

The following are the main reasons of conflicts in the case of the transfer of power over land.

1. Attorneys claimed that now they were the owner of the land, because they had purchased that land from landowners against their payment as an attorney.
2. Attorneys sold the land to someone else and did not inform the actual landowner.
3. Attorneys changed the land use, for their own benefit and interest, without consent of the actual owner.

On further exploration of this problem, it emerged that the land was sold or used for purposes other than agriculture, as shown in Table 6.7. This land-use change in the regions also caused degradation of land.

Table 6.7: Results for the Explanation of Conflicts on the Base of Power of Attorneys

Region	Number of households with general power of attorney	Number of households who claimed that now they were landowners	Number of households where attorneys sold land without informing landowners	Number of households where attorneys changed land use for their own benefit
SKR	13	5	4	4
QR	5	0	3	2
NR	7	0	3	4

Source: Field survey 2008

According to data presented in Table 6.6, about sixty five percent of the households with problems involving general attorneys were affected by land-use change, either by the attorneys themselves or following the sale of the land by the attorneys to other parties (Figure 6.11). The actual landowners received no benefit from their property, and this was the main issue of conflict. In some cases, the landowners themselves were not interested in selling, and the deal was based on fraud; the matter was now filed in court. These difficulties were mostly based on irregular sales under registration act 1908, Section18 Sub-section 45 (explained in Chapter 5).

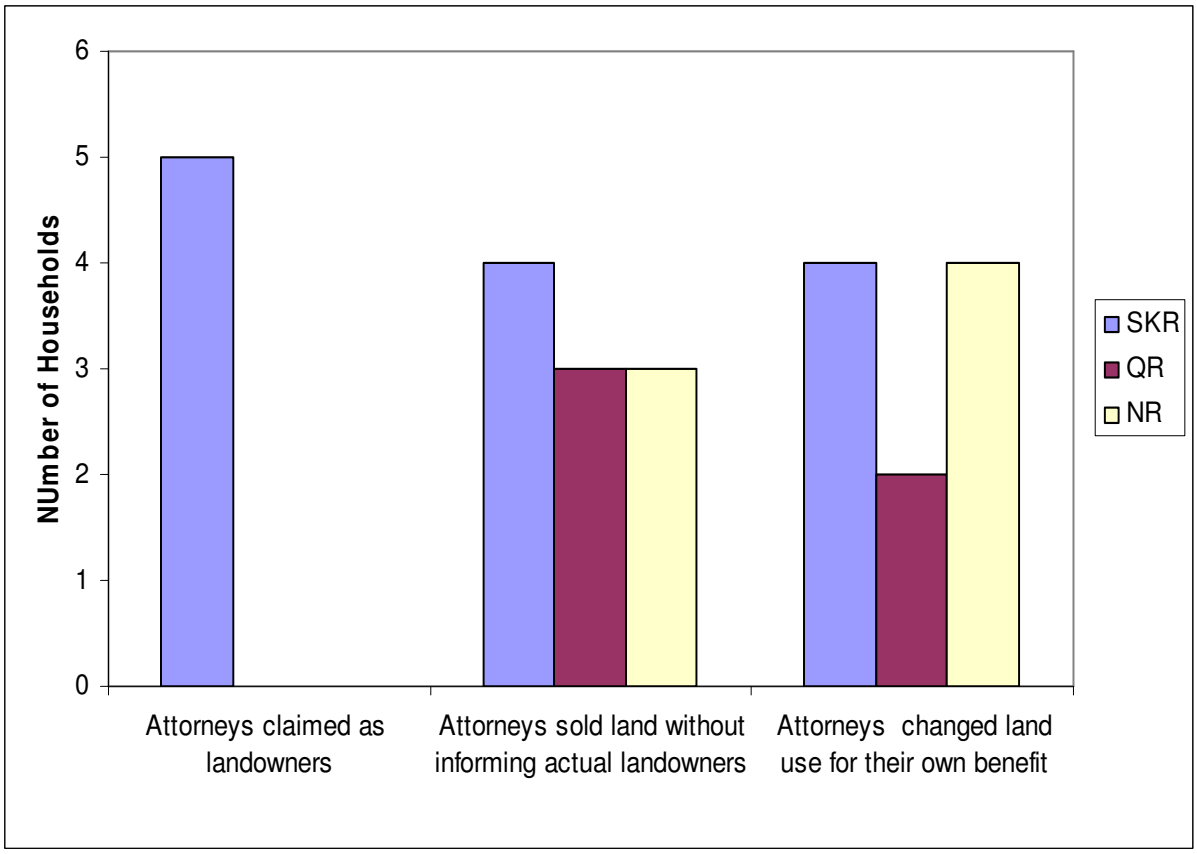


Figure 6.11: Conflicts Related to Irregular Sales

Source: Own presentation, field survey 2008

Finally, these three variables (land distribution, transfer of land among heirs, and conflicts on the base of land degradation) were tested collectively, for their combined effect on land degradation, and the following results were obtained (Table 6.7). The same negative trends for land distribution and transfer of land variables and positive trends for conflicts based on distribution were obtained in the new estimated models. Thus, the relationship between the variables has conformed, thereby supporting our main hypothesis.

Table 6.8: Relationship between Conflicts Concerning Land Distribution and Land Degradation

Variables	Estimated Coefficients	t values
Results for SKR		
Constant	135.07	3.98*
Land distribution (L_{dis})	-54.49	-3.36**
Transfer of land ($L_{T)}$	-9.32	-1.67***
Land distribution Conflicts(C_{dis})	11.54	1.57***
Results for QR		
Constant	89.67	2.75**
Land distribution (L_{dis})	-23.37	-1.52***
Transfer of land ($L_{T)}$	-15.66	-2.64**
Land distribution Conflicts(C_{dis})	14.06	2.37**
Results for NR		
Constant	10.47	3.63**
Land distribution (L_{dis})	-2.12	-1.50***
Transfer of land ($L_{T)}$	-0.81	-2.40**
Land distribution Conflicts(C_{dis})	0.93	2.80**

Source: Survey 2008

* Significance level = 1%

** Significance level = 5%

* ** Significance level = 10%

Figure 6.12 shows a comparison of all three regions to determine in which region land distribution has a stronger effect. According to the results of this study, the land of case study region 1 (Shaikhupur-Kamoki Region) is more affected because of improper intergenerational land distribution, and in the third case, this effect is minimal and almost negligible. Whereas this variable cannot be ignored in these three regions as it plays a significant role in land degradation, two other variables (see below) have a stronger effect in the Qadirabad Dam region. Data obtained from this region is well explained for the estimation of these three variables against land degradation, as the value of R^2 is 0.44, whereas for the other two regions, its value is slightly less in SKR than in the QR, and in the third case, the value is low but still provides valuable information.

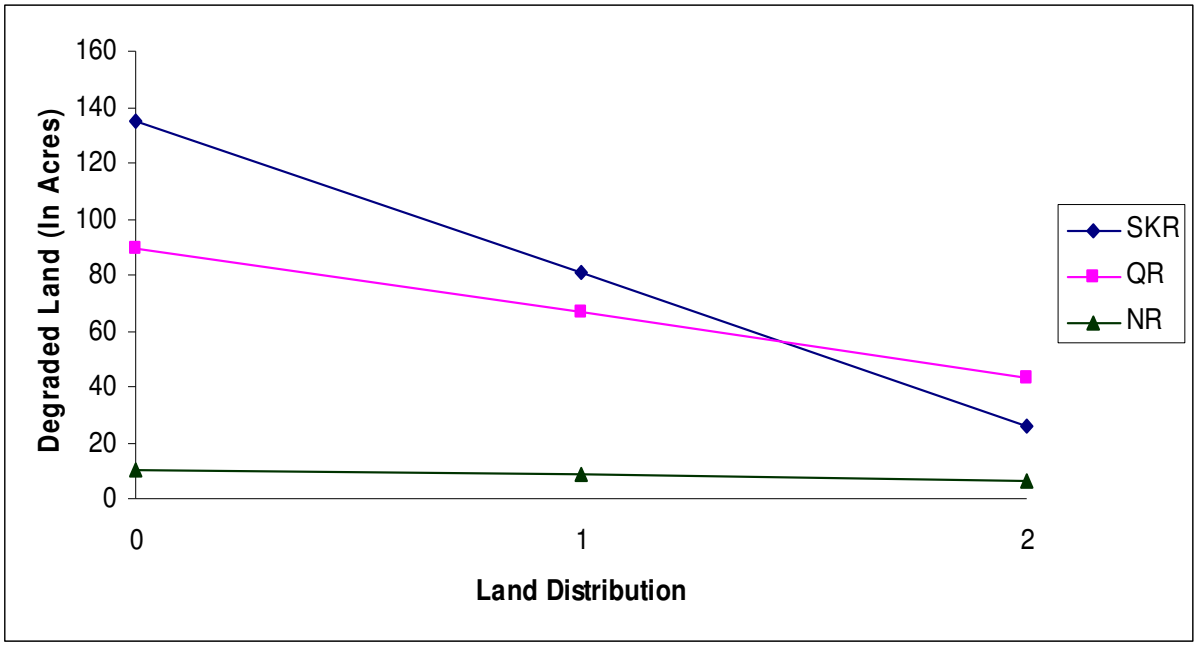


Figure 6.12: Effects of Intergenerational Land Distribution on Land Degradation in the three Case Study Regions

Source: Own Presentation, field survey 2008

Similarly, in Figure 6.13, a comparison analysis of the transfer of land among heirs and land degradation is presented; this was obtained from the estimated results of the combined effects of the three variables explained in Table 6.8. The results show that the poor influence of implemented institutions as related to land transfer from one generation to the next in the

Qadirabad Dam region is a cause of land degradation to a greater extent than in the other two cases.

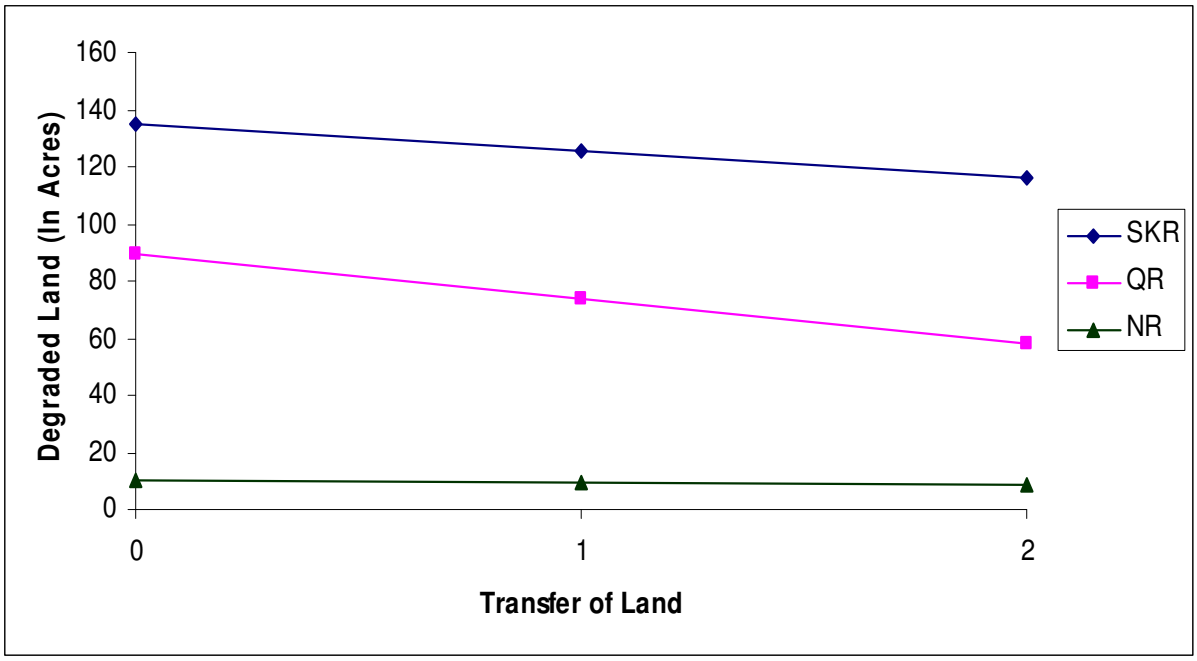


Figure 6.13: Effects of Transfer of Land among Heirs on Land Degradation in the three Case Study Regions

Source: Own Presentation, field survey 2008

Land degradation because of conflicts was also observed to be maximum in the first case study region as shown in Figure 6.14. In these comparative results of these regions, the institutions for intergenerational land distribution and land transfer are clearly not being properly implemented and cause land degradation. In the first study region, the condition of distribution of land was the worst, and the results establish that the improper implementation of institutions in this region is one of the causes of land degradation. Similarly, the Qadirabad Dam region also suffers from a similar situation, and the results show that the condition of transfer of land is less than optimal. Although the land of the third case is much better than that of the previous two cases, conflicts related to land distribution and land transfer are still significant and may be one of the reasons of land degradation in this region, as in the other two regions.

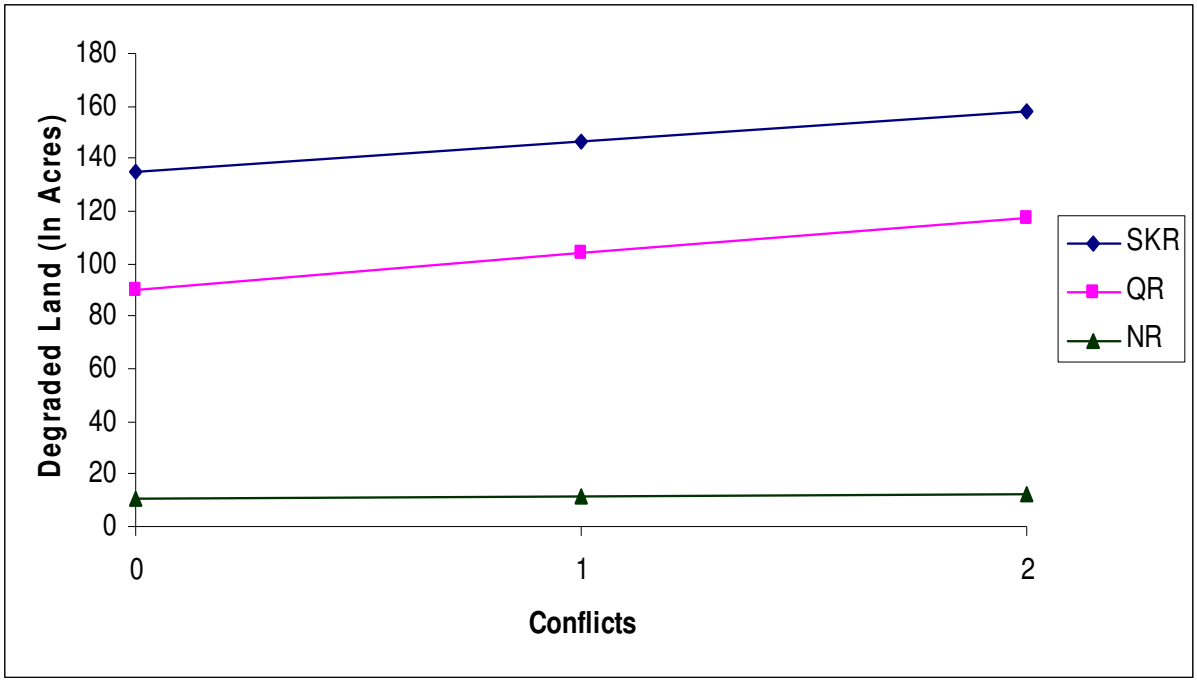


Figure 6.14: Effects of Conflicts on the Basis of Land Distribution among Heirs on Land Degradation in the three Case Study Regions

Source: Own Presentation, field survey 2008

6.4 Summary

The objective of this chapter of the study has been to examine the link between land degradation and property rights for selected regions of Pakistan for 150 households in 2008. This analysis contributes to the existing literature on land degradation and property rights by asking the question as to whether conflicts arise from the distribution of land matter in shaping the link between land degradation and property rights. The analysis finds strong positive impact of conflicts on land degradation.

The estimated results indicate that the effects of regional culture and family traditions, in the case of non-distributed land, increase land degradation. In this case, the law is not properly implemented; all the land is transferred to the eldest son who increases his returns by the over-utilization of land, which causes degradation. In such cases, other shareholders with land distribution rights are deprived, because of the asymmetric power of the eldest son (Knight 1992). Those privileged family members avail themselves of relaxations of the law (for example, the will of the testator and family agreements do not need to be registered) in their favor and take more than their share.

Similarly, the non-distributed possession of rights plays a significant and important role in the deterioration of resources. In this case, all shareholders undertake a family agreement and use the land collectively. However, because of the lack of integrated behavior toward resource use, the land becomes degraded (Larson and Bromley 1989: 236); no one is willing to give full overall authority to one member of the group The land thus cannot be categorized as private property and loses its productivity because every shareholder has his own idea for the cultivation of the land, with resulting alienation. Old landowners have old ideas, with techniques of a single agricultural product for more output, whereas new landowners have better knowledge of sustainable agricultural development and farming systems. This updated knowledge is helpful against land degradation. Culture and traditions therefore overlap the land laws and affect the security of the land and land rights in the region. Actions causing conflicts, such as demolishing the water supply and burning the standing crops, also spoil land capable of production. Hence, the proper setup of the transfer of land from one generation to the next is helpful in saving the land and keeping the soil healthy.

7 Does Land-Use Change Affect Land Degradation? Observations from Selected Regions of Pakistan

7.1 Introduction

Land use in all the three study regions varies widely with regard to the distance from the local road, the geographical location of the plot, the size of the plots per land-use type, the land management, and the cropping system. Initially, most of the land in the region was used for agriculture: farming and livestock production. This land usage was developed under the influence of the natural vegetation and promoted by the culture of the inhabitants for an extremely long time and was not disturbed anthropogenically. In the late 1970s, during the green revolution in the country, the landowners of this region also tried to improve output and used more fertilizers and pesticides on their land; this disturbance led to the degradation of the land, and soil quality in this region became degraded over time. In recent years, various other reasons have been observed for this land degradation. Land-use change in these areas is one of the major reasons for the reduction in the quality of soil and the decrease in the output of crops per acre.

Major changes in land use obviously affect the inhabitants of the land (mainly plants and animals). A great deal of literature is available interpreting the relationship between land-use change and land degradation; for example, Joshop (2004) argues that the removal of top cover soil, as a consequence of land-use change, increases the evapotranspiration[44] from soil, which generates a shortage of water availability for crop production. These changes modify soil quality and cause erosion and sedimentation, and eventually agriculture production falls (Xiubin 1996, Johnson and Lewis 1994, Zhao-hua 2006).

However, if these changes are associated with the regular increase in resource use to increase the efficiency for the production of food and fiber, which increases the wealth and well being of the owner, some special policies are required to save the land (Foley et al. 2009), particularly for countries dependent on agriculture. The demand for policies and management of agricultural production tends to encourage collective management, as this

[44] The process of transferring moisture from the earth to the atmosphere by evaporation of water and transpiration from plants is known as evapotranspiration.

transfers responsibility from the individual to groups or to society as a whole (Blaikie and Brookfield 1987).

In the absence of land management and proper agricultural policy, it is important to know who will make decisions about the land-use change, because during interaction of the different land users, conflicts can occur (Hite 1998) that cause land degradation (FAO/BFFP). Thus, for land conservation, well-organized planning polices and environmental institutions are required (Mawasi 2001).

Blaikie and Brookfield (1987) have found that intensive agriculture is the major reason for land cover change and degradation. Similarly, Johnson and Lewis (1994) argue that not only excess cultivation, but also other land-use options, e.g., urbanization, coal mining, and transportation, causes soil erosion.

This chapter measures the relationship of land-use change conflicts and land degradation, by finding the ranks of available options in the study regions with respect to their worsening of land productivity. To test the hypothesis that "land degradation is caused by conflicts related to land use change and land distribution conflicts", I have also calculated the correlation between these two independent variables and their relationship to land degradation. To establish this, I have used the framework presented in Chapter 3, where within the action arena; the landowners have different opinions for land use for the same plot.

This chapter comprises three parts. The first part (Section 7.2) explains the theory of land-use change and conflicts based on these uses. In the second Section (7.3), the effects of the land-use change on land are presented with an explanation of the various conflicts that arise as the results of land-use change. The correlation of these conflicts with the conflicts of land distribution (explained in Chapter 6) and the joint effect of these two different conflicts on land degradation for the study region is also presented. Finally, a summary of the findings obtained from the study is described in Section 7.4.

7.2 Theory

Land-use change in the three study regions is an economic process that is based on the concept of the return from land pursuant to alternative activities performed on the land (Segerson et al. 2006: 3). The observed decisions about land use have also been related to cost-benefit analysis; if for one use of his land, a landowner might have to bear more costs than benefits, or the average returns from his land are lower than the inputs, he will not prefer

this use, because his ultimate goal is to maximize his returns. While taking their decisions, some landowners ignore the externalities that result as returns from land-use change (Milion 2006: 163). These externalities are considered as negative, for example, if they have effects on the soil causing land degradation.

Various reasons for land-use change have been observed in the study regions; the main reason was the change in the natural environment, e.g., shortage of water and land conditions, affecting the decision of humans for land use. Inflation also changed the mind of a landowner; for example, high inflation rates for seeds and other agricultural inputs raised the cost of production and caused a reduction in the returns of the landowners. Culture and traditions were also of some personal interest and had value for the land users and landowners. An influential actor was observed to force other members of a group/family to accept his decision for the use of their land. Similarly, geographic factors were also of the great importance for the issue of the land-use change, such as the location of land, the infrastructure in the region, and the distance of the land from the cities and main roads. In addition, property rights played a significant role in land-use change (Lambin and Geist 2007: 3).

For the security and sustainability of the land, the proper implementation of rights to the access to the land and for the use the land were very important, as they were found to be highly supportive of land management. Cultural-based relaxations in laws caused a crucial situation both for the landowners and the land itself in the form of conflicts (Alston 1999: 3). Deprived landowners were not in the position to decide about their land and were bound to accept the pronouncement of another family member who had strong bargaining power or even had his own opinion on the use of the land; the wish of the deprived landowners to maximize their own returns was not possible because of the influence of the powerful actor (Knight 1992, See Section 3.6). This disturbance created a situation of conflict and caused land degradation, because most of the decisions of landowners were not socially efficient and created an externality such as in the form of biomass reduction (Johnson and Lewis 2007: 164) on land used for non-agricultural purposes.

The analysis of these conflicts for land-use change is helpful in order to answer the following research question presented in this study. What sorts of conflicts exist among the different actors, mainly landholders and land users, for land-use causing land degradation? For the analysis of this research question, more questions have to be answered. For example, what options are available for land use change? Are people in favor of this change of land

use? Which option is more efficient in causing land degradation in these particular regions? Is there any association between the conflicts regarding land-use change and land distribution conflicts? The following results have been observed.

7.3 Results

All three areas visited for this study are important from an agricultural point of view and because of their geographical location. As explained in Chapter 4, the land quality is different in these regions, and they have been selected on the basis of the various levels of degradation. Shaikhupura-Kamoki has a medium level degradation of soil, whereas Qadirabad Dam region suffers from high level degradation. The third region, the Nandipur region, is categorized as being a low-level degraded land area. Geographically, this land is also very valuable for both agricultural and non-agricultural use, as in all these selected regions, most of the visited villages lie near to main roads. These roads link major cities, all of which are industrial cities. Many other actors, such as industrialists and real estate builders, are involved in the situation because of the importance of this land. The average distance of these villages from the respective main roads is two kilometers. This current trend of land transformation reflects the possibilities for land degradation.

7.3.1 Different Options for Land-use Change Observed in the Region

Mainly, nine different options for the land use were observed in the region; these are presented in Table 7.1. For all these options, landowners from all visited households were asked, whether they were interested in a change in land use or not, and the response was tested against land degradation. C_{use1} is the variable for the response of the respondent 1 (R_1) from each household, and C_{use2} is the variable for the response of the respondent 2 (R_2) from each household (See Subsection 4.5.1 and 4.5.2). The results are presented in the Table 7.2.

Table 7.1: Land-use Options in the Regions

Option	Explanation
Agricultural Use	Land is used for agriculture by the landowner, or he may rent it or sell it
Housing Society	Land is used for residential plots of various sizes, together with the relevant infrastructure such as roads and sewerage systems, plus other facilities such as Mosque, super markets, and play grounds
Industry	Land use includes both manufacturing and processing units
CNG Filling Stations and Patrol Pumps	Land is used for facilities to provide compressed natural gas and patrol used in vehicles as fuel
Hotel and Marriage Hall	Land is used for hotels and marriage halls for public use on payment
Fish Farming	A shift of business
Poultry Farming	A shift of business
Government Acquisition	Land is used for the construction of road or other major projects
Others	Land is used for play grounds or is left in trust

Source: Survey 2008

These results show the positive relationship between the land-use change decisions of landowners and land degradation. This indicates that, when landowners take a decision for higher returns, they have to pay a cost in the form of land deterioration. More land is degraded when an additional household decides on land-use change.

Table 7.2: Results of the Effects of Land-use Change on Land Degradation for all Study Regions

Variables	Estimated Coefficients	t values
Results for SKR		
Constant	6.06	1.06
Respondent (R_1) is in favor of land-use change (C_{use1})	12.14	2.47**
Respondent (R_2) is in favor of land-use change (C_{use2})	9.55	1.52***
Results for QR		
Constant	7.44	0.82
Respondent (R_1) is in favor of land-use change (C_{use1})	12.85	1.51***
Respondent (R_2) is in favor of land-use change (C_{use2})	14.28	1.82***
Results for NR		
Constant	4.80	16.10*
Respondent (R_1) is in favor of land-use change (C_{use1})	0.56	1.57***
Respondent (R_2) is in favor of land-use change (C_{use2})	0.62	1.66***

Source: Field Survey 2008

* Significant at level 0.01

** Significant at level 0.05

* ** Significant at level 0.10

In the case of SKR, the estimated value for the coefficient of respondent 1 is 12.14, and the value for the second respondent is 9.55. These results show that the decisions of respondents 1 in this region, who are generally loyal to their traditions and not believe in huge changes, such as from mono-cropping to multiple cropping, are harmful to the land, as they stick to the old systems and want to survive in the old setup. On the other hand, the value of respondents 2 is lower compares with the respondents 1 but is positively related to land degradation; this group of respondents in the region wants to change the land use. The value of R^2 is 0.19 in this sample, which means that only 19 percent of the total variance of land degradation has been explained, which is not impressive and shows that the data is much scattered.

In the other two cases, viz., QR and NR, respondents 1 are less responsive as compare with respondents 2. In QR, the case is slightly different; because most of the landowners are already convinced of the new use of land for a better standard of living, and respondents 2 want further to change it, because they think that they can obtain even more returns from this new use, although respondents 1 are not supportive of this further new change. Both the old and new changes cause land degradation, which may increase with any change in the decision of another household for land use. In this case, the R^2 value is 0.143, according to which, once again, the value of the total explained variance is low and the deviation in data in high.

In case of the Nandipur region, the response is lower meaning that the people in this region are not in the favor of such a change, which increases the land degradation, although here the data is also very scattered, because of the small value of R^2; nevertheless, the land-use pattern is much more favorable to resource conservation. These results show that, although a change has a negative impact on the land, the landowners are in favor of this change, because they want to maximize their individual returns and ignore social costs and losses in the form of resource damage.

7.3.2 Effectiveness of Land-use Options for the Degradation of Land

To check which is the most dangerous among these land-use options for land degradation, the efficiency of land degradation with respect to every option was calculated. For this, three separate regression Equations were estimated for the three regions, as land degradation was a dependent variable, and the different options were independent. To estimate the response of the question as to which option more efficiently participates in the process of land

degradation, the efficiency of land degradation with respect to each option was calculated by using all options separately.

In the case of the study region Shaikhupura-Kamoki, the Equation was estimated for four different options; however, one option (CNG and filling station) was dropped from this analysis, because of the collinearity problem in estimation. The four options, viz., fish farming, poultry farming, hotel and marriage hall, and others were constant and were not included in the estimation. All other remaining options showed a positive response, with land degradation in the region; the results are summarized in Table 7.3.

Table 7.3: Results of Estimated Variables in the Case of SKR

Variables	Estimated Coefficients	t values	Effectiveness
Constant	20.00	3.48**	
Agricultural Use (A)	-9.80	-1.56***	-0.23
Housing (H)	12.22	1.70***	0.10
Industry (I)	11.13	1.52***	0.08
Government Acquisition (G)	35.00	3.73**	0.09

Source: Field Survey 2008

* Significant at level 0.01

** Significant at level 0.05

*** Significant at level 0.10

According to the estimated Equation, the value of the coefficient of agricultural use is negative, which means that, with an increase of land use for agriculture, land degradation will decrease. All remaining estimated variables have a positive relationship with land degradation and suggest that, with an increase in these variables, land degradation will also increase. Government acquisition has the strongest effect, as its estimated coefficient is 35. In this

estimation, about fifty three percent of the data is explained, and the F distribution is also highly significant.

In the case of the Qadirabad Dam region, six variables were estimated, which are presented in the Table 7.4. The CNG and patrol filling station was deleted because of collinearity, and two options, viz., 'others' and 'government acquisition', were constant. In this case, the estimated coefficients for all the determinants were positive and will cause an increase in land degradation in the region; only the option of 'hotel and marriage halls' is an exception and is insignificant for this case.

Table 7.4: Results of Estimated Variables in the Case of QR

Variables	Estimated Coefficients	t values	Effectiveness
Constant	13.75	1.60***	
Agricultural Use (A)	15.06	1.61***	0.20
Housing (H)	32.92	2.97**	0.13
Industry (I)	41.25	2.15**	0.03
Hotel and Marriage Halls (H&MH)	11.92	0.91	0.02
Fishing Farms (F)	18.72	1.92***	0.15
Poultry Farming (P)	28.25	1.90***	0.04

Source: Field Survey 2008

* Significant at level 0.01

** Significant at level 0.05

*** Significant at level 0.10

The coefficient for industry has a maximum value, which indicates that additional industry in the region would be dangerous, and the land will be affected because of land-use change. On the other hand, agriculture is significant but causes the least effect on land in comparison with the other variables. Most of the variables in this case are significant at the ninety percent confidence interval. Approximately, twenty three percent variance of the data is explained, as the value of R^2 is 0.225, and the model is fit for this estimation.

Similarly, in the last case study region, the regression model was estimated for the estimation of unknown coefficients of land-use change options for land degradation. Three out of nine options were estimated, whereas four were constant, viz., others, fish farming, poultry farming, and hotel and marriage halls, and could not be estimated; the option CNG was deleted because of the collinearity, as in SKR.

Table 7.5: Results of Estimated Variables in the Case of NR

Variables	Estimated Coefficients	t values	Effectiveness
Constant	5.63	12.94*	
Agricultural Use(A)	-0.70	-1.50***	-0.074
Industry (I)	1.33	2.58**	0.056
Government Acquisition (G)	1.38	1.83***	0.015

Source: Field Survey 2008

* Significant at level 0.01

** Significant at level 0.05

*** Significant at level 0.10

These results also indicate that agriculture as a land-use change is a favorable option and is negatively related to land degradation. This means that, if more land was cultivated, less land would be degraded. Although the effect of this variable is quite small, it has some significance. The other two effective variables are industry and government acquisition, which

have a positive impact; thus, if land was used for these changes, more land would be degraded because of biomass loss. In the following, all these options are discussed in detail.

Agricultural use: The study regions are wetlands and represent vast land resources for rice cultivation in the country. The landowners in all these twenty visited villages are of small and medium scale with an average plot size of thirty five acres. Only in one village, have the landowners reported their plot size to be approximately eighty acres on average. From the era of green revolution, many developments have been conceived for the promotion of agriculture in these regions; the benefits from these developments have been measured both at the macro and at the micro level in terms of the productivity from the land and the living standard of the local landowners, such as a reduction in poverty. The best land was alienated by the indigenous people, and the major focus was the cultivation of a cash crop, mainly rice, by using some advanced feasible technologies.

These technological changes and policies for an increase in output gave concerns about their effects on soil productivity. Real effects on land degradation were evident with extensive use of the small plots and because of mono-cropping; these two effects resulted in soil exhaustion. The problem was exacerbated by the continuous production of rice season after the season, without alternative crop cultivation.

During an interview, an expert in the rice agriculture research centre Kalashakako provided information about the soil condition of the selected regions. According to his view, land degradation in these areas, in which the land is saline or sodic, can be measured through the pH of the soil. If the pH is highly alkaline, up to the level of 7.8, then this suggests the reduction in the availability of nutrients such as phosphorous. The presence of a greenish layer of leaf-like growth on the land confirms the sign of phosphorus deficiency.

In the first case study region, the Shaikhupura-Kamoki region, the pH was greater than 8.5, and the soil had high sodium content. The land had a greenish layer of leaves, which reflected the deficiency of phosphorous in the soil. According to the expert's opinion, the soil contained less than 11 ppm on average of available phosphorous. Figure 7.1 shows land affected by such a deficiency in one of the visited villages (Majuchack).

Figure 7.1: Land Affected by Sodic Soil in the Village Majuchack

Similarly, in the second region, Qadirabad Dam region, the land was degraded because of waterlogging, and according to the expert's information, major crops frequently suffered from excessive wetness in various parts of the region, as the water saturation zone remained above the soil surface (Figure 7.2). These areas suffered with a loss of nitrogen, as nitrate added to the soil was unable to recover completely and not only caused denitrification in these areas, but also formed toxic nitrates (Subrahmanyan 2009:).

Figure 7.2: Land Affected by Waterlogging in the Village Alipur Chattah

In the third case, Nandipur region, some of the land was saline, with a pH level of 7.8, and the reason of this salinity was the inadequate drainage system. For this purpose, a large amount of water is required, which is helpful to keep a favorable salt balance in the root zone. Figure 7.3 is a photographic presentation of the land and shows the physical condition of the soil with the occurrence of the salinity problem.

Figure 7.3: Land Affected by Salinity in the Village Mahrwala

Most of the landowners in these regions have changed their mind set with regard to cultivation, as now they grow wheat and some other crops on their land, instead of just rice, because of the shortage of water in the region and the change in the quality of land for the production of rice. Because of this, the estimated results for agricultural use from the data obtained through a survey in the two regions SKR and NR have a negative effect on land degradation. In the case of QR, people remain loyal to mono-cropping, which causes land degradation.

Although land is degraded, most of the population of the regions are still dependent on agriculture for their livelihood. According to the survey results, fifty two percent of landowners in SKR are in favor of the cultivation of their land, whereas in QR, thirty six percent people have an interest in agriculture, and in NR, sixty six percent people are working on farms and growing wheat together with fodder on their land (Table 7.6).

Table 7.6: Agriculture Use Comparison for the Three Regions

	Cultivable Area (in percentage)	Households with an interest in agriculture
SKR	73 %	52%
QR	48%	36%
NR	77%	66%

Source: Survey 2008

According to the measured efficiencies for these three regions, this option is most effective in Shaikhupura-Kamoki, where its value is 0.23, with a negative sign. Hence, by using proper techniques for cultivation, land degradation can be controlled in this region, as it can in the Nandipur region, where this option is not as efficient as in SKR but can have a significant effect. In the Qadirabad region, the value of efficiency is 0.20, meaning that this land would be more degraded by switching over to this option.

Real estate building: Housing and real estate building is a fast growing business in these regions of Pakistan because of the surroundings, as these regions are sandwiched between large cities and are highly suitable for job opportunities. The businessmen are interested in these areas for building housing societies to accommodate people who wish to have a more serene lifestyle outside the cities, because these cities have become crowded and nosier as they have expanded. House builders provide homes for the people together with many other modern facilities within a locality.

Technically, a house is a man-made structure on a piece of land, for which the land is mainly reshaped for the required structure. Construction work near or on the agricultural land in these areas is not favorable to the productivity of land because of following reasons.

1. The loss of agricultural output in the case of land-use change for housing, instead of farming (Johnson and Lewis 2007: 164).
2. Material used in construction, such as concrete and paint, has the potential to contaminate the soil and underground water (Environmental protection agency, Gujranwala) and caused degradation.
3. The direction of the flow of underground water might change; this will not favor other parts of the agricultural land (Soil fertility research centre, Lahore: 2001).

4. During and after the construction of a housing society, the soil would be exposed, which will lead to vulnerable erosion (Soil fertility research centre, Lahore: 2001).

Together with all these limitations, this change of land use has also been clearly observed in all three regions, and moreover, most of the conflicts related to the land distribution were linked to this use in one form or another (discussed in Chapter 6). According to the survey results, currently in SKR, four percent and, in QR, ten percent of landowners have already sold their land to real estate builders. On the other hand, in the third case study region (NR), no one is involved in this selling. During a visit to the environmental agency and city planning commission in Lahore and Gujranwala, I discovered that laws exist there for the protection of environment, but in the case of private property, they are not implemented. Every individual landowner has a right to decide about the use of his estate. On being asked if they were interested in this business, and whether they wanted to sell their land for building, the landowners said that, if selling was profitable and gave them more returns in comparison with cultivation, then they would sell. Currently, nineteen percent landowners were involved, and twenty nine percent of them were interested as shown in Table 7.7.

Table 7.7: Comparison of Land-use Change for Housing in the Three Regions

	Number of households having already sold their land for housing at the time of survey	**Households interested in selling their land for housing**
SKR	9 %	11%
QR	8%	14%
NR	0%	0%

Source: Survey 2008

With regard to the calculated efficiency of land degradation (Table 7.3 and 7.4) for this option, in SKR, the value is slightly less than the value for QR, but both are efficient for causing land degradation in the regions. In NR, this option for land use was not observed. Thus, these results indicate that soil erosion would increase, because of this land-use option in

the area, with a maximum in the Qadirabad Dam region, a more moderate effect in Shaikhupura-Kamoki region, and no effect in the Nandipur region.

Industry: Some parts of the land in these three regions have been affected by degradation to a degree sufficient to reduce its productivity, because of various industrial activities. The major four industrial options observed in these regions are ceramics, furniture, leather, and rice-processing units. Some landowners have already sold their land for these businesses, and some were interested in selling or starting their own business. Details of this are given in Table 7.8. Mostly, landowners have a lack of finance and, hence, were interested in rice-processing units, because of the availability of raw material.

Table 7.8: Comparison of Land-use Change for Industry in the Three Regions

Options	Households interested in industry in			Total
	SKR	QR	NR	
Ceramics Industries	3%	_	_	3%
Furniture Industries	_	1%	_	1%
Leather goods	_	_	4%	4%
Rice-Processing Units	8%	1%	19%	28%
Total	11%	2%	23%	36%

Source: Survey 2008

All those households involved in industrial activity were divided into two categories: (1) already sold or having started their business or (2) interested in this activity (shown in Figure 7.4). According to the estimated effectiveness, the Nandipur region is highly affected by these industrial activities (Table 7.4) as compared with other land-use options in this region. However, the comparative analysis of three region shows that the Shaikhupura-Kamoki region is most effected among all the three (Table 7.2) with a value of eight percent land degradation

because of this use. In the other two cases, land is degraded by about six percent in NR and three percent in QR, because of industry as an option of land-use change.

As per the survey results, most of the owners were interested in the business of rice-processing units. Some units had already been established in these regions (shown in Figure 7.4). These were observed as a major pollutant within the area and not only cause dust and noise in the regions, but also are harmful to the agricultural land of the area. They produce rice-milling dust and soot (produced through the generators of the mills), with exhaust fumes that settle on the crop and land in the nearby agricultural plots; this causes the subsequent land degradation.

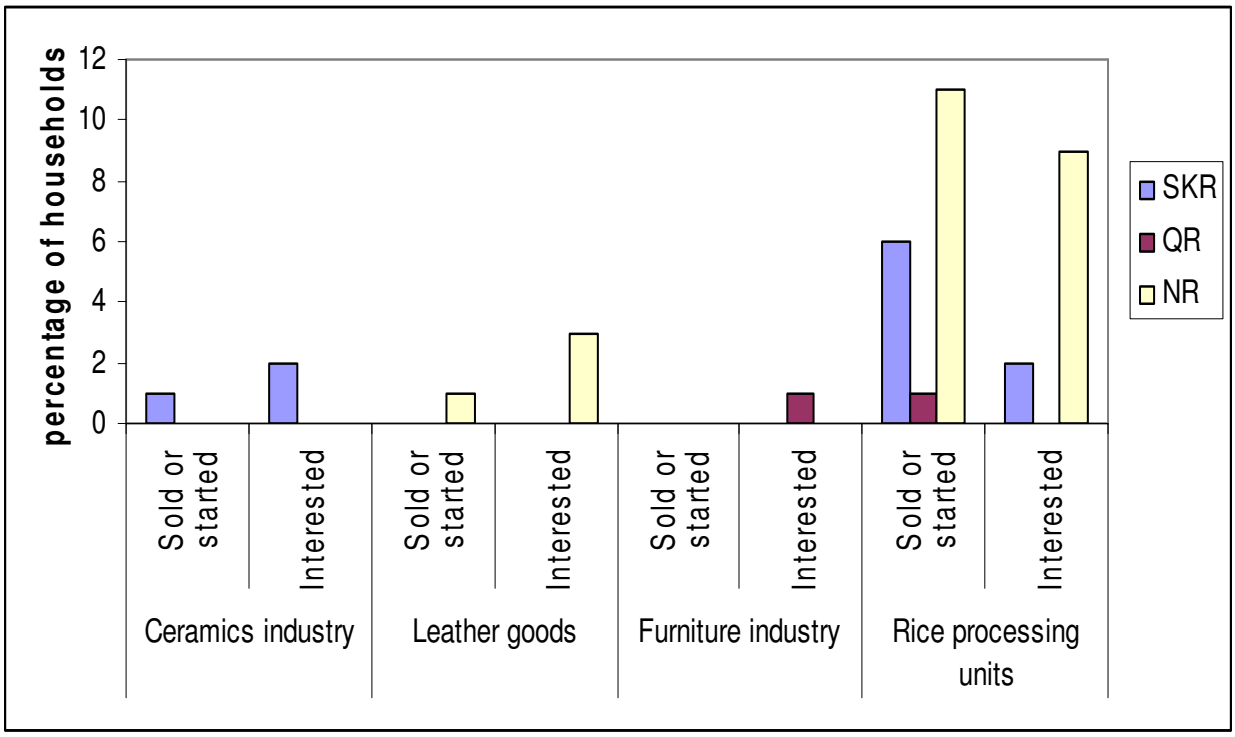


Figure 7.4: Comparison of Regions regarding Industry as an Option of Land-use Change

Source: Own Presentation, Survey 2008

Similarly, mineral processes such as the grinding of calcite and soapstone for the ceramic industry produce a huge quantity of dust, which retards the process of the infiltration of water into the soil after settling onto the land (Soil fertility institute, Lahore, Pandey and Singh 2009). This is one of the reasons for land degradation in SKR. In the case of the leather

industry, some chemicals are used that have toxic effect on the health of the soil (Kanagaraj et al. 2006: 541). Therefore, effluents from these industries have become a major source of land pollution in the region NR.

Raw material, which is used in the manufacturing of furniture, such as metals and dyes, has an influence on land in the Qadirabad region. Metal contaminants mostly affect the ground water, and metal dust emissions when they settle down onto the land stop the filtration of water into the soil. Similarly, dyes and pigments also have a negative impact on the land (Wilson 2002: 1), as they produced toxic effects on the land and cause a fall in the productivity in QR.

Fish farming: Fish farming is another alternative option of land use in the case study area of the Qadirabad Dam region, where generally soil suffers with a waterlogging problem. Integration between agriculture and aquaculture as a way of salvaging some productivity from degraded land has been tested by various soil scientists. As a result of this study, fish farming does not have any positive effect on the soil quality and plays a considerable role in the decreasing of the productivity of land (Hamed 2007: 2). Mostly, the fish farmers did not look after their production units and allowed fish waste, drugs, chemicals, and uneaten food to pass into surrounding water resources. This contamination in the water may cause sedimentation (Environmental Defense Fund (EDF) and, hence, the soil becomes less permeable and does not allow water to penetrate deeply, which enhances the problem of waterlogging in the region.

Fish farming is estimated as one of the major reasons of land degradation in the Qadirabad Dam region, while this option has not been observed in the other two regions. The results show that this option of land-use change is approximately fifteen percent responsible as a cause of waterlogging on land. Currently, twenty four percent of households are engaged in this business, and twenty six are interested in it for future land-use change. The data indicate that, with the increase in this change, more land will become degraded.

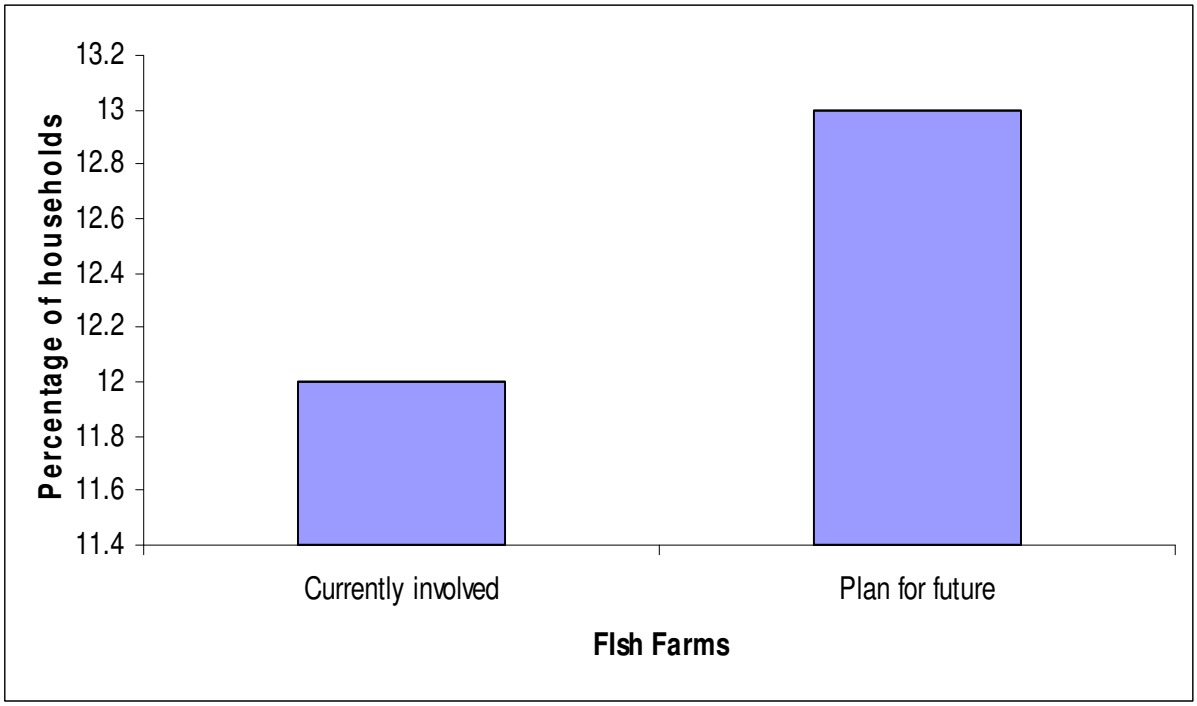


Figure 7.5: Fish Farms in the Qadirabad Dam Region

Source: Own Presentation, Survey 2008

Government acquisition: The construction of major physical infrastructure such as roads and highways is the responsibility of the government in Pakistan, and for this purpose, the constitution allows that the government can acquire land for public use (explained in Chapter 5). Although these changes are essential for the economic growth of the country, these decisions of land acquisition sometimes cause severe damage to agricultural land. As shown in this study, in regions where the government acquired good agricultural land, soil erosion has resulted, and much good agricultural land has lost its productivity.

For the construction of the motor way from Lahore to Islamabad, a vast area of agricultural land was acquired by the government in the region of Shaikhupura-Kamoki, and the local farmers were forced to leave their land with an inadequate amount of compensation. Construction of this motor way caused heavy soil erosion in the region, which affected other land and reduced its productivity. According to the estimated results, nine percent of land degradation has been in response to government acquisition in this region.

Similarly, in the Nandipur region, approximately one percent of land degradation is in response to government acquisition, as here the government acquired land for the installation

of electricity poles in the region. In the Qadirabad Dam region, this option was a constant, suggesting that the government had not acquired land in this region.

The land acquisition process was not properly implemented in these regions as stated in the law book. Government officials were influential and, without prior notice of land acquisition, sometimes took land for public use; for example, for the installation of an electricity pole in Mustafabad, the government used the land without the consent of the owner, which caused damage to the ground and other parts of the land also became uncultivable (shown in Figure 7.6). For the mental torture and financial loss caused, the landowner took the responsible government department to court in 1998; the first court hearing was delayed to 2005, because of the strong bureaucratic power of the concerned department. In this scenario, only six households were interested in allowing their land to be used for public purposes in all three regions (shown in Table 7.9).

Table 7.9: Households Interested to Opt for 'Government Acquisition'

Regions	Number of households
Shaikhupura-Kamoki Region	1
Qadirabad Dam Region	2
Nandipur Region	3

Source: Survey 2008

Figure 7.6: Waterlogging Caused by the Installation of an Electricity Pole in the Village Mustafabad

Poultry farming: The poultry business is used as an option for land-use change only in the Qadirabad region; in the other two areas, this option was constant and was not possible to estimate for the results. Poultry manure can be used to increase the productivity of the soil, as it contains organic fertilizers such as nitrogen and phosphorus. The general understanding is that, by using this manure, any deficiency in phosphorus and nitrogen can be recovered.

However, the results of this study do not agree with this hypothesis and show a positive relationship with land degradation. This land use option has a strong positive relationship with the land degradation, as the value of slope is 28.24, and a measure of responsiveness for this variable is 0.04, i.e., four percent of the land degradation occurred through the poultry business. This may have occurred as a result of the soil condition, which is wet because of the waterlogging problem in the area, and in these types of soils, the spreading of nitrogen-containing material forms highly toxic nitrites, and most of the nitrogen is lost because of the water on the surface (Subrahmanyan 2009: 9).

Although this phenomenon has had a bad impact on the environment and is not helpful as a solution for land degradation in the region, it is a profitable business for the landowners. At the time of survey, twelve percent of landowners had decided to shift to this profession and had established poultry farms on their land; four percent were interested in this.

Hotels and marriage halls: This land use is directly related to the construction of building and reduces the vegetation on the land surface. This causes soil erosion and the loss of many minerals from the land; for example, in the region QR, this option has been observed, and the agricultural land in the surroundings has lost its productivity in terms of agricultural output.

The geographical location of the areas influences whether this change is a profitable business. Landowners, who had sold their land for this purpose, had their plots near to the grand trunk road between the two big cities, Gujranwala and Gujrat. About two percent of households were involved directly in this business, and six percent had sold their land for it. Another six percent of them showed an interest in this business. The estimated results of the study suggest that this option is insignificant and has no major impact on land degradation in the region. In the case of other two regions, this option was constant.

Compressed natural gas and patrol filling stations: Another option of land-use change was observed in these regions, i.e., 'fuel filling stations'. While estimating the results for this study, and in order to remove the problem of the collinearity among data, this option was deleted in all cases and was not possible to estimate.

These fuel filling stations have underground tanks for the storage of patrol or gas, and these might be responsible for causing contamination by hydrocarbons that might enter the soil beneath the site, with possible toxic effects on the underground water and a reduction in its absorption into the soil. Despite these effects on land, this is an option that increases the return of the landowners, and so in the three areas, some landowners were involved in this business (Table 7.10).

The results of this study regarding land-use change indicate the lack of a sustainable developmental model for these regions, which causes land degradation and reduces the contribution of agricultural output at the local and national level. Land belongs to the private owner, and they are free to take decisions about the use of it.

Table 7.10: Comparison of the Three Regions Regarding Land-use Change for Filling Stations

	Number of households already involve in this business		Households interested in selling for filling stations	
	Own Business	Sold	Own interest	Interested in selling
SKR	4 %	0%	6%	2%
QR	4%	0%	2%	2%
NR	0%	0%	0%	0%

Source: Survey 2008

Figures 7.7 depicts the land-use change response to the land degradation in the Shaikhupura-Kamoki region, in which the effect of housing is the worst, and which shows that housing is not a suitable option for land-use change. The impact of agricultural use is negative on the land, and so this use might be considered as the best use for land. These results show that a good agricultural policy would be helpful for reclamation of the resources and for the restoration the productivity of land.

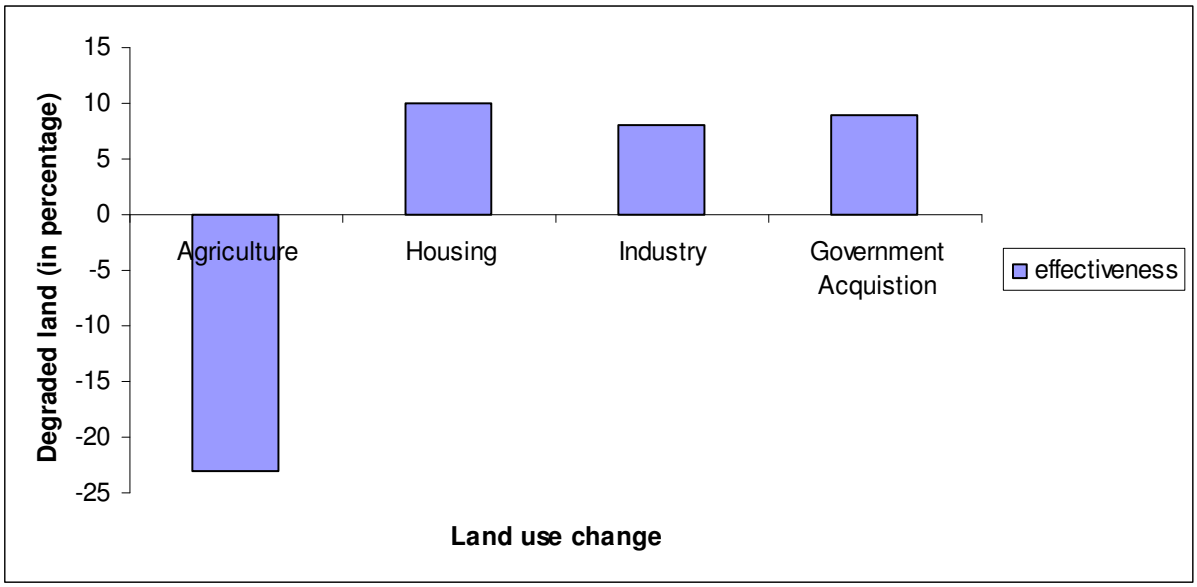


Figure 7.7: Percentage Response of Land Degradation with Respect to Percentage Change in Land-use Change in SKR

Source: Own Presentation, Survey 2008

Similarly, in Figure 7.8, a comparative analysis of the effect of the different options in the Qadirabad Dam region is presented; here all the variables have a negative impact on land and cause land degradation. Agriculture is established as being the worst option, because landowners are not willing to alter their pattern to that of multiple crops. Fish farming is also a strong reason for land loss. In this case, other alternatives were available for land use, but because of poor management and the lack of suitable policies, all these options increased soil degradation.

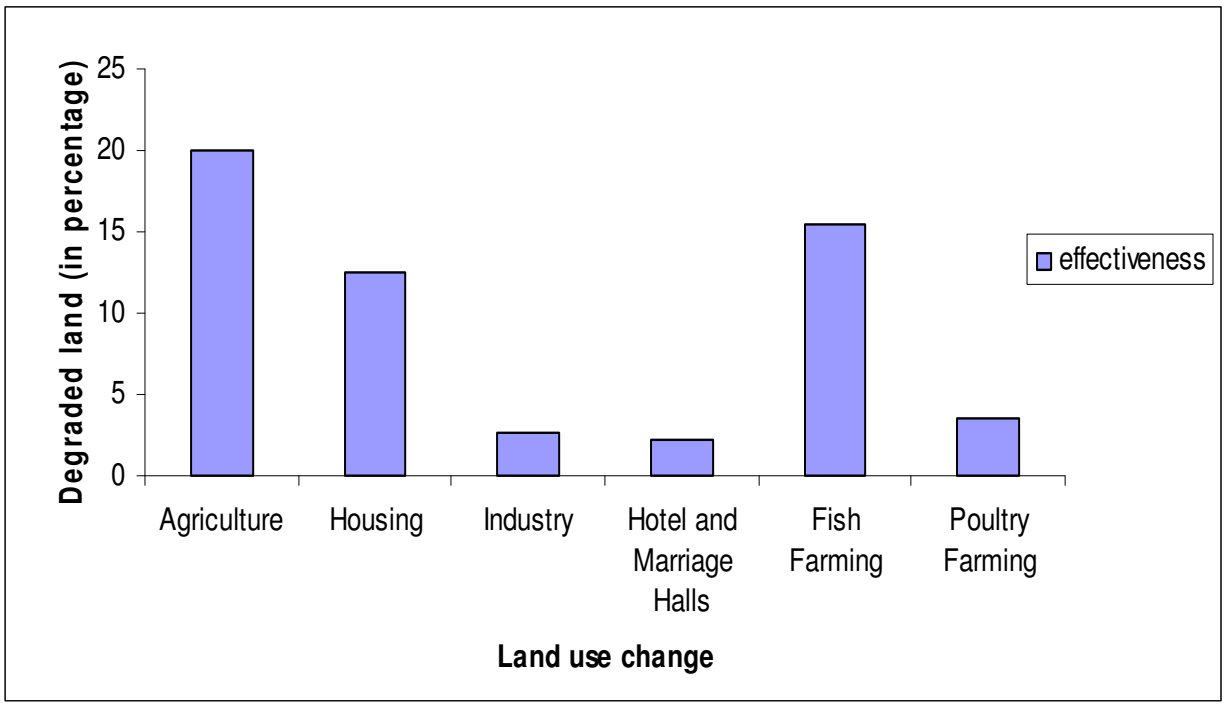


Figure 7.8: Percentage Response of Land Degradation with Respect to Percentage Change in Land-use Change in QR

Source: Own Presentation, Survey 2008

In Figure 7.9, only three options are shown as being effective for land degradation in the third case study region. As in SKR, agricultural use has a negative impact on land degradation; however, if more land was be cultivated with different techniques, it would be beneficial for the landowners, as they could earn more income and improve their livelihoods. All other observed options were not in favor of land productivity and caused erosion.

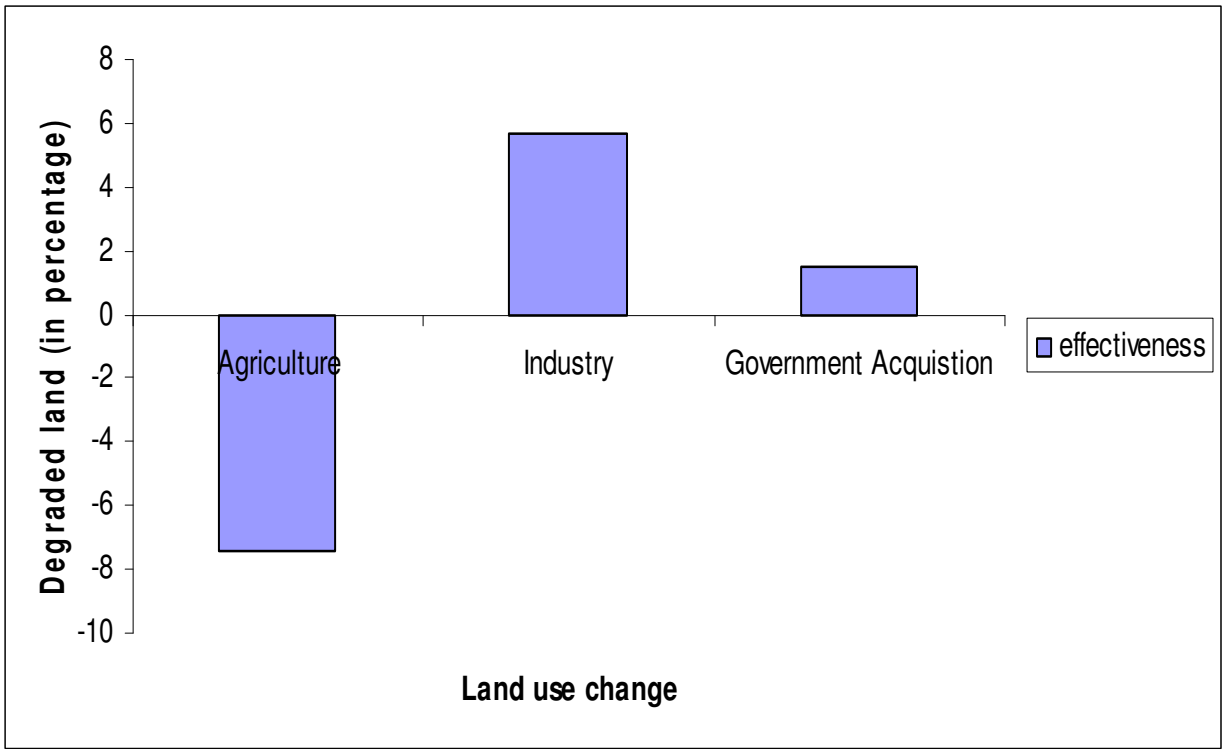
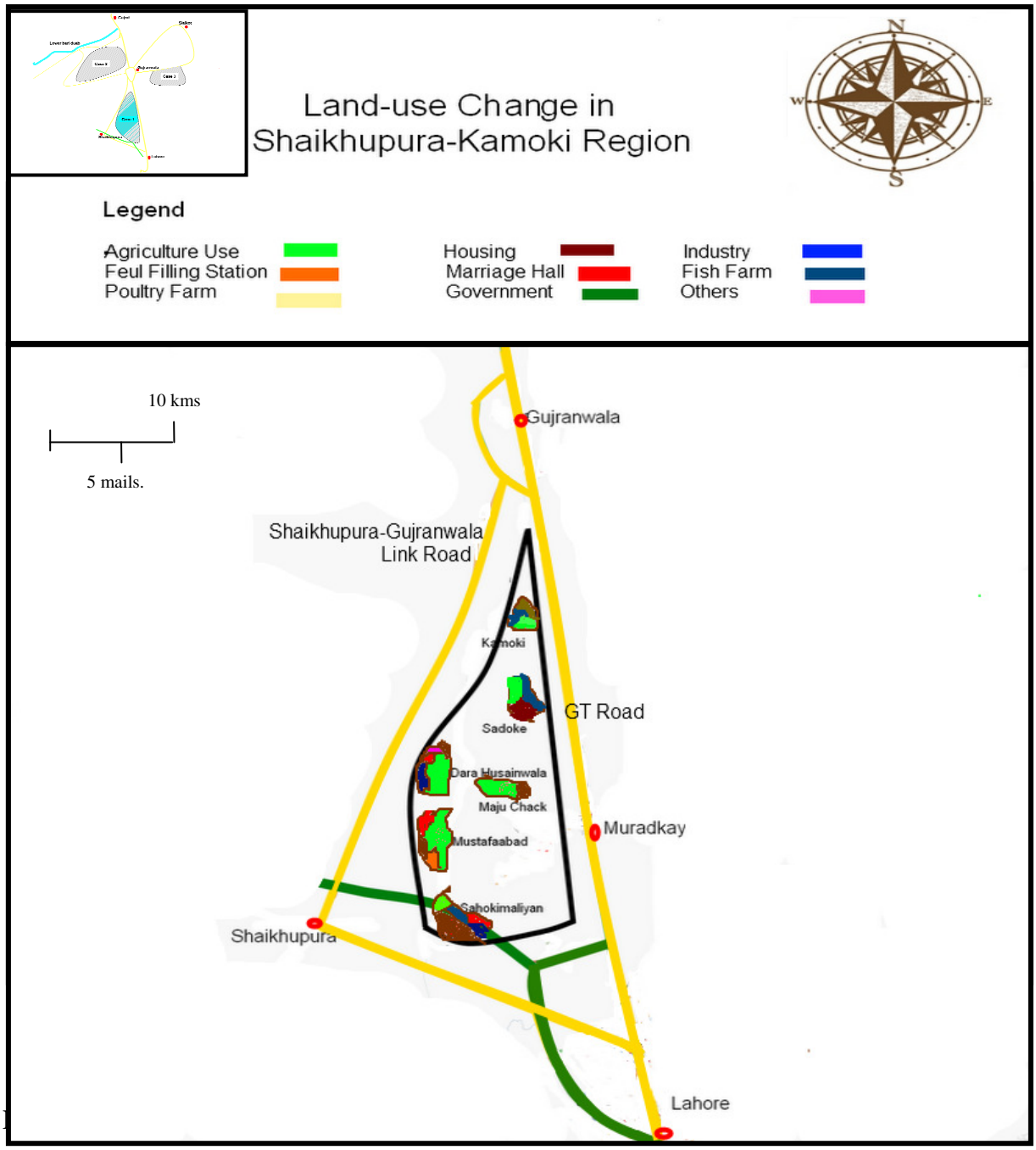


Figure 7.9: Percentage Response of Land Degradation with Respect to Percentage Change in Land-use Change in NR

Source: Own Presentation, Survey 2008

In Figures 7.10, 7.11, and 7.12, the situation of land degradation because of land-use change is shown in these three regions, respectively. Figure 7.10 depicts that, the land in Shaikhupura-Kamoki region (SKR) is mostly used for the agricultural use. Housing and industry are other alternatives of land use in this region. Figure shows that mostly the land, in the areas near the main roads, is used for non-agricultural use, e.g. near Lahore more land is used for housing, while near Gujranwala, a mixed trend is observed.

Similarly, in other Figure 7.11 and 7.12, structure of land use in Qadirabad Dam Region (QR) and Nandipur Region (NR) is explained. From this Figure, it is clear that trend of agricultural use is less in this area. Other alternatives are marriage halls and fish farms. The fish farms are near the canal, and marriage hall are constructed on the Gujranwala Hafizabad Road. Figure 7.12 explains that in Nandipur region (NR) two options are popular, one is agricultural use and other one is industry.



region

Figure 7.10: Land-use Change and Land Degradation in the Shaikhupura-Kamoki Region

Source: Own Presentation

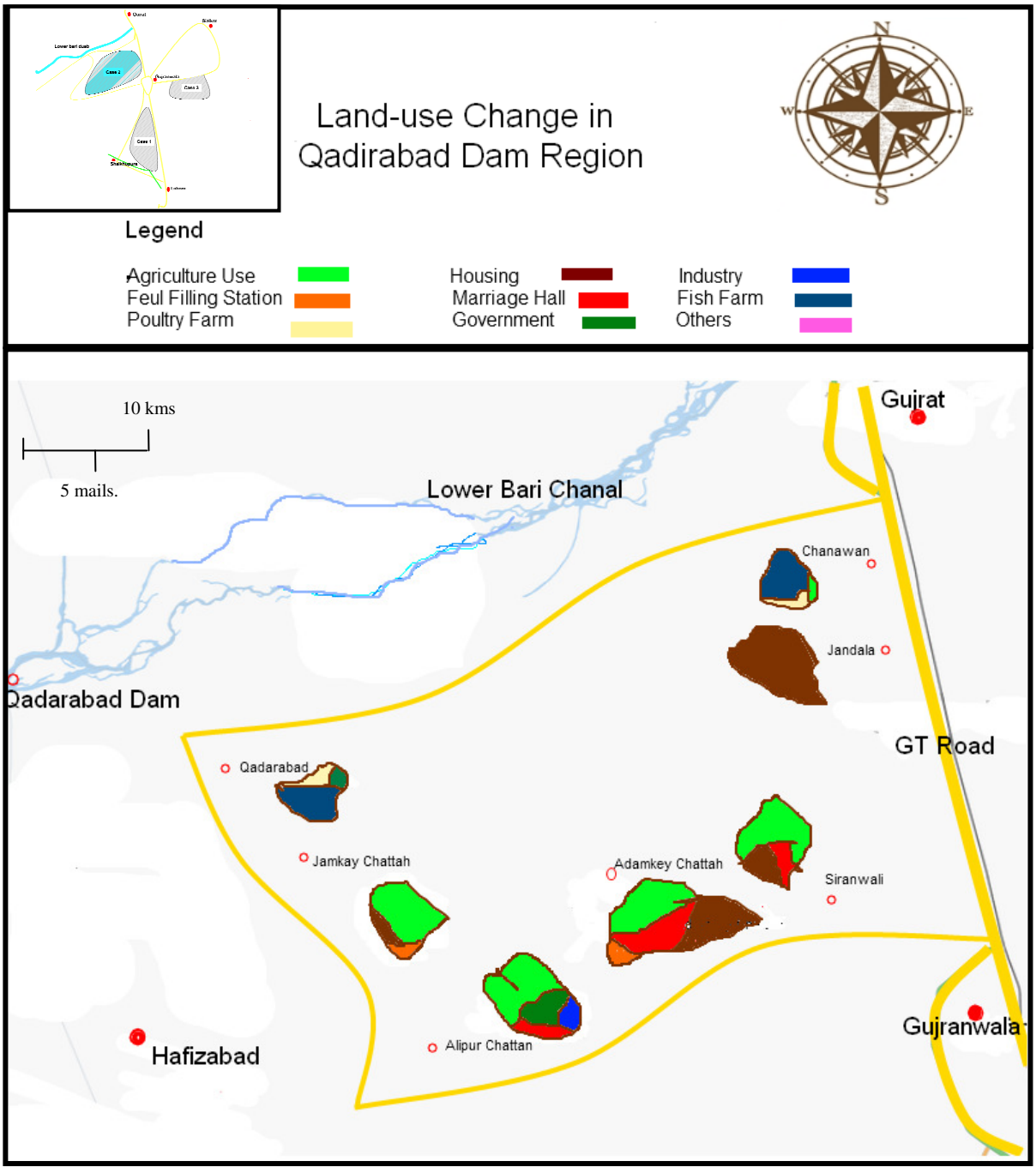


Figure 7.11: Land-use Change and Land Degradation in the Qadirpur Dam Region

Source: Own Presentation

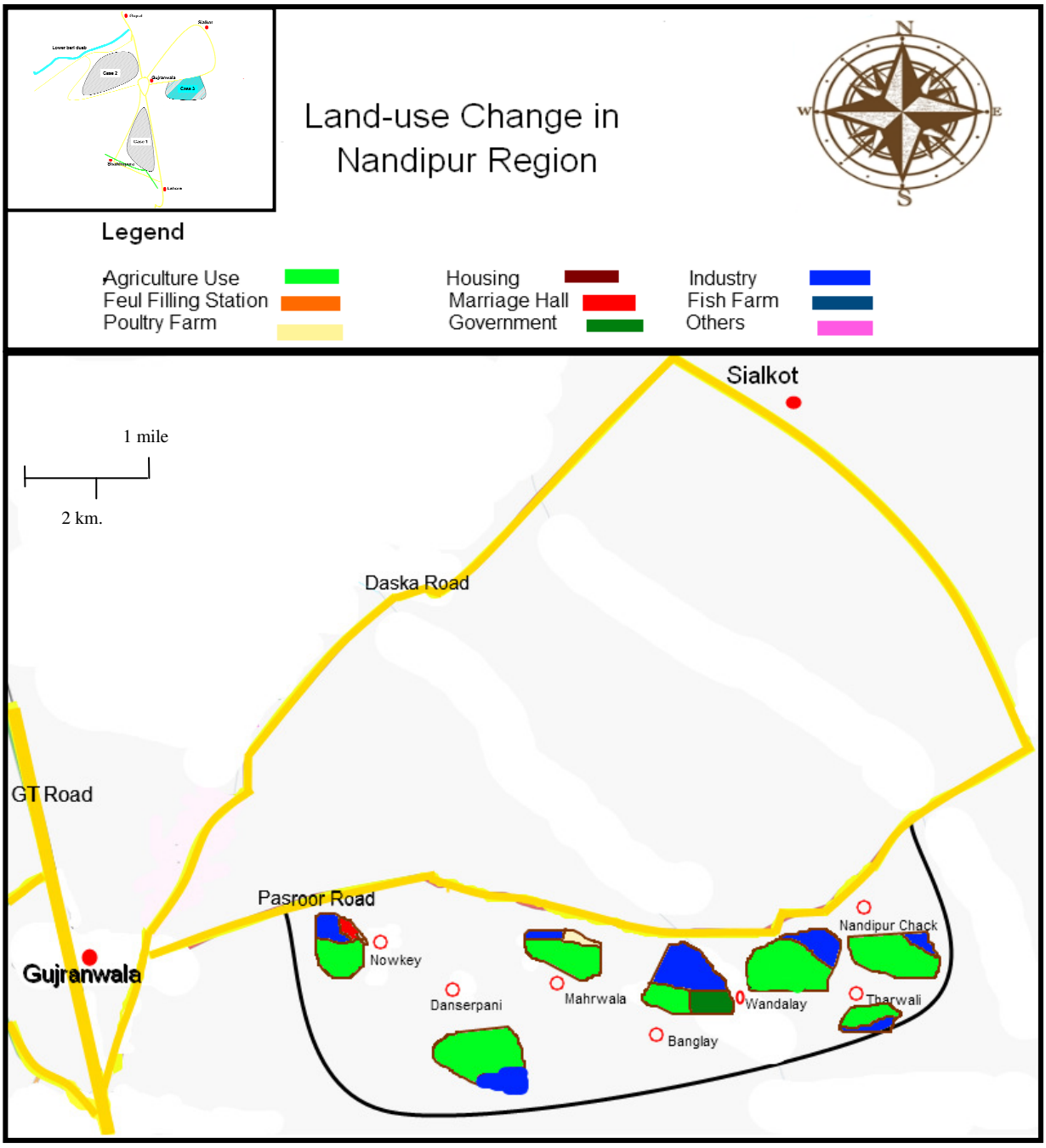


Figure 7.12: Land-use Change and Land Degradation in the Nandipur Region

Source: Own Presentation

7.3.3 Conflicts because of Land-use Change

From the results presented in Chapter 7, the trend of landowners is clear: some of them are interested in using land by themselves, and others want to sell. This mainly depends on the returns that they will get from their land. Some conflicts are also related to this decision of the landowners. During the study, two major reasons for conflicts have been observed: one involves intergenerational land distribution[45], and other involves land-use implications.

Land-use change conflicts were based on choices, as one respondent from one household was interested in change or had already changed his mind with regard to the land use, and the second respondent from the same household was not interested in this change or was interested in a different use of the land. In this part of the study, I try to explore the resource-use conflicts and their association with conflicts based on intergenerational land distribution in these regions. This association is explained in the Figure 7.13. These conflicts of land-use change occurred as a chain, because the landowners wanted to change the use of land or not, and if both respondents of same household were interested in change, then their choice could be different from each other. Here, the issue of property rights was related to these conflicts, as landowners were not allowed to alienate their land, and some of them were interested in selling, but they were not allowed to do so.

To confirm this relationship between these two different conflicts and their joint behavior, a correlation between these two variables has been calculated for the three visited regions, separately (Table 7.11). These results establish a strong interrelationship between these variables. For the region of Qadirabad Dam and Nandipur, the value of correlation is highly significant at the 1 % level of significance, whereas in the third case, the value is significant at the 5% level of significance.

Table 7.11: Correlation between Land-use Conflicts and Land Distribution Conflicts

	Correlation	Significance level
SKR	0.28	5%
QR	0.49	1%
NR	0.50	1%

Source: Survey 2008

[45] See Section 6.3.2

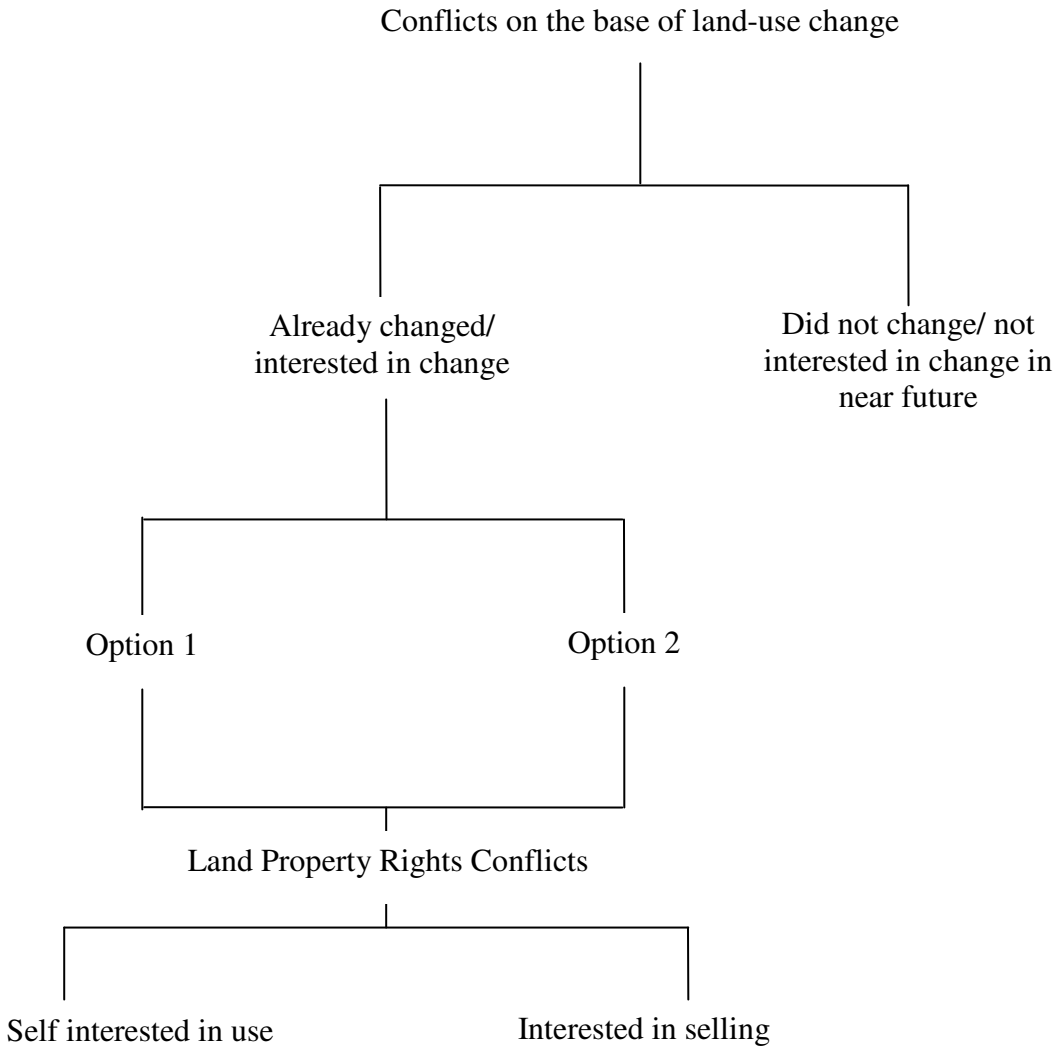


Figure 7.13: Association between the Land-use Conflicts and Land Distribution Conflicts
Source: Own Presentation

The values in the Table 7.11 depict neither a very strong nor too weak a relationship of these conflict variables. All values are positive; this shows that the linear relationship between these variables is positive, so that as the conflicts between land-use change increase, the conflicts of land distribution also increase and vice versa.

To check the effect of these conflicts on land degradation, three different Equations were estimated, one for each region. In these Equations, the land use conflicts and land distribution

conflicts were predictor variables, and land degradation was respondent. The results of these Equations are given in Table 7.12.

Table 7.12: Effect of Land-use Change Conflicts and Land Distribution Conflicts on Land Degradation for all Study Regions

Variables	Estimated Coefficients	t values
Results for SKR		
Constant	6.03	1.07
Land-Use Change Conflicts (C_{LUC})	10.82	1.69***
Intergenerational Land distribution conflicts (C_{dis})	13.78	2.92**
Results for QR		
Constant	15.21	3.36**
Land-Use Change Conflicts (C_{LUC})	11.77	2.16**
Intergenerational Land distribution conflicts (C_{dis})	11.92	2.07**
Results for NR		
Constant	4.95	20.52*
Land-Use Change Conflicts (C_{LUC})	0.59	1.63***
Intergenerational Land distribution conflicts (C_{dis})	0.64	1.77***

Source: Field Survey 2008

* Significant at level 0.01

** Significant at level 0.05

* ** Significant at level 0.10

In all cases, these variables behave significantly influence land degradation and show a positive relationship, as more conflicts, either based on land use or land distribution, would

lead to more land degradation. This is an explanation for an improper implementation of land distribution institutions and the non-existence of the land-use change institutions. The value of slope for intergenerational land distribution is greater than the slope of land-use change conflicts.

In the case of the Shaikhupura-Kamoki region, the value of R^2 is 0.246, which means that approximately twenty five percent of the data is explained, and that the F value is also significant. In the case of Qadirabad, the value of R^2 is 0.272, and in Nandipur, its value is 0.123. The last-mentioned value is not so impressive but gives the impression that at least some of the data is explained. All this discussion has established the hypothesis that land degradation is the caused not only by land distribution and the transfer of land among heirs, but also by land-use change conflicts.

The histories regarding land issues and conflicts related to land distribution and the land-use change have mushroomed all over these regions. These situations are highly complex leading to difficulties in dealing with them and causing a problem for the legitimacy of the prevention of reduction in land productivity. In the case of some conflicts, landowners have had to inform the court, and this makes the situation difficult to decide. Most of the conflicts reported to the court are still being heard. The case filed by Ghulam Rasool, one of the respondents for this research from the village near Kamoki, is an example of such cases.

> "Ghulam Rasool took a case to the civil court, against Ikram Ullah and another person, for his legal share in agricultural land that had not been under cultivation for a number of years. He reported in his plaint that he and Ikram Ullah were joint owners of this piece of land. He alleged that Ikram Ullah let it to another person, who was respondent two for this case, illegally by a registered deed. Another person used this land for the construction of a permanent structure for manufacturing purpose and converted to industry on the premises, in the absence of a plaintiff from the village. Because of this action of a third party, the land had lost all the characteristics of an agricultural estate and was no longer able to produce crops, because of the lost of fertility of the land by erosion.
>
> The appellant wanted his share back and was no longer interested in joint property. The civil court was not ready to accept this case, because this was not in their jurisdiction. On the one hand, this was a case of land distribution, and on the other hand, land revenue was also missing in the case of agricultural land.

According to law, the district revenue officer is responsible for the partition of any kind of property in cases of assess to land revenue."

From last twenty five years, this case has been in court and is still pending because of the complex situation of the land ownership and the land-use change because of third party investment. This situation illustrates the effect of conflicts from land distribution and land-use change on soil fertility and mentions the degradation of not only of particular land, but also of native land, because of a change in direction of the underground water (Soil fertility research institute, Lahore). This discussion further establishes the hypothesis that land degradation is caused not only by land distribution and the transfer of land among heirs, but also by land-use change conflicts.

7.4 Summary and Conclusion

The effects of land conversion refer to impacts on agricultural productivity generated by the process of destruction and reconstruction and involving alterations in the land parcel and land use. Direct or indirect consequences of human actions, related to land-use change, accelerate the resource loss. In the case of land, this loss is in the form of low production or even a lack of agricultural output.

Intensification of agricultural farms for increased production in order to maximize current revenue and the abandonment of productive land as a result of mono-cropping are the main reasons of land degradation, because of agricultural use, in these three regions. In two regions, agricultural use has an inverse relationship with the land degradation, which means that if landowners changed their agricultural pattern and shifted to multiple cropping from mono-cash cropping, they could improve the condition of their land.

Similarly, the reason for the loss of one hundred percent agriculture output is land-use change in the form of industrialization and housing. Hotel and marriage hall construction is also a disruptive element for land degradation, because of the impervious surface of the land. Loss of biodiversity and agricultural structure, because of the growing business of fuel refilling stations, shows a diminishing capacity of agricultural output. Economically, returns from developing the land for these land-use changes exceed the returns from farming but this has a negative impact on the ecological integrity of land and natural condition of the soil.

Similarly, fish and poultry farming has also polluted the land, as the vast majority of landowners are not carrying this out in a land-friendly and a sound way, because the first

priority of farmers is to increase their revenues, and the land and other environmental issues always take a backseat economically. Fish farming is the source of discharge of nitrogen in one of the study areas (Qadirabad Dam Region), which has already suffered with waterlogging and has a deficiency of nitrogen in its soil composition. Poultry farming, in the same way destroys the land productivity, as by spreading poultry litter on these lands, they produce highly toxic nitrites, which cause a further loss of fertility.

Land degradation problems have also increased in these areas, because of government projects of infrastructure development. Government has a weak capacity for the sustainable development of rural areas. In the absence of designing and enforcing land use practices, the construction of roads and installation of electricity poles cause erosion and sedimentation on the soil of these regions. Improper land acquisition laws are another reason for damage to land and a reduction in its productivity.

The value of the effectiveness of agriculture supports the need of agricultural policy for the better utilization of the resources in the region. This policy should help landowners to decide about the use of their land in the way in which they maximize their returns, earn more wealth, and increase their well being. The proper management of the land would be helpful in achieving higher production, which would raise the gross domestic product.

Conflicts related to the inequalities in land distribution and the transfers of land to the actual owner are deep-rooted in structure and have a strong association with the land-use change and alterations on the land. The improper implementation of laws exploits the rural poor, as in case of the damage to land and the loss of returns from agriculture practices. In this chapter, the analysis has established that land is degraded because of these different conflicts, either based on land distribution or based the land-use changes in the study regions. Strong local governance may be helpful to resolve these conflicts, so as these representatives would guide the landowners with regard to better land-use decisions, which would be favorable to the landowners, and they would earn more profit in a much better way. These decisions would also be beneficial for the country's economy.

8. Conclusion

8.1 Introduction

This study has accessed potential issues related to land degradation. This investigation has provided a new dimension for such research, as its empirical results explain the relationship of family land distribution and land-use conflicts, to the study problem. The purpose of this chapter is to present the comprehensive conclusions drawn from the study. In Section 8.2, the empirical conclusions are stated, and in next Section 8.3, theoretical conclusions are explained. Section 8.4 is related to the policy conclusions, in which various suggestions and recommendations are given together with some discussion of the problems. The last part of the chapter presents future possibilities for research in this direction.

8.2 Empirical Conclusions

Over-utilization of agricultural land, in the case study regions, is one of the main reasons of land degradation. The users of this effected land suffer, because of the loss of production and of the different farming operations. Landowners want to install tube wells to solve the problems of waterlogging in the region Qadirabad Dam. The people, living in Shaikhupura-Kamoki region, are willing to try gypsum on their land for the reclamation of sodic soil. The employment of gypsum is very useful; however, in these regions, this method is not effective because of the shortage of water, and the farmers do not have the proper information regarding its usage. Because of limited knowledge about high-yield production in those regions suffering from salinity, the landowners have failed to achieve greater output from their fields in the Nandipur region, with an increase in land degradation seen in previous years. These technological farming operations are costly for indigenous small landholders.

The heritance law is not fully implemented in these regions. These poor landholders have cultural and family traditions, which have also been tested with respect to land degradation in this study. These families are very strict and do not allow the proper distribution of land among shareholders. According to this culture, land is not only an asset, but also a sign of prestige in the village. They believe that, if they distribute their land between shareholders, they might lose their power among other villagers. However, shareholders want their shares, and on the base of this tussle for distribution or not to distribute, conflicts between family

members are generated. Illiteracy and unawareness increase the rate of these conflicts, as people are not fully aware of their rights.

These conflicts are based on three concepts, 1) land was not distributed at all, 2) land was orally distributed, and 3) land was legally distributed. The first case, where the land is not distributed, occurs in situations of strong family traditions, when land is handed over to the next senior member after the death of the property owner, generally the eldest son of the deceased, and he is responsible for the livelihood of all other members of the household. The new landowner tries to obtain increasing output from this piece of land to fulfill the needs of the other family members or to increase his individual profit. Because of the lack of awareness of their rights, the other shareholders are deprived. Sometimes, these caretakers sell land against a registered sale deed and with the help of the local revenue personal (Patwari). In both forms (for more agricultural output or sale), the land is degraded and loses its productivity.

The second concept of conflicts is related to the oral transfer of land according to the Registration act 1908. In this type of transfer, most of the families are hesitant to opt for a long and complex registration process. Normally, the eldest son has taken the charge of the estate, and all other shareholders make a family arrangement to share any profit from their share of land. According to the law, these agreements are not needed to be registered, as all of the family knows about their share. In this case, no one has full possession of the land, and no one is free to use his ownership authority. Everyone is bound to other shareholders, and because of this, the land is degraded.

In the third case, the land is evenly distributed, and the landowner is free to use his full rights on his property; however, the disputes in this case are slightly different. Landowners transfer their power to another person (a family member), by executing the general power of attorney through which they give all rights to the donee, who tries to earn a maximum income from the property and possibly to undertake illegal dealings, e.g., he uses the land for non-agricultural purposes to his own benefit or sells the land without the permission from the actual land owner and does not give him the price of that land. These reasons also cause conflicts and land degradation.

In this study, these conflicts have been tested for causing land degradation. A direct relationship has been found between the manipulated variable and respondent variable, producing more conflicts between family members, related to land distribution, and causing

more land degradation in the regions. During this study, the strongest relationship of these conflicts with land degradation was found in the Qadirabad Dam region, which was chosen as a highly degraded area for the survey, and the hypothesis of the study, viz., that the intergenerational land distribution and land transfer among heirs are the reasons for land degradation, was accepted. Property rights, particularly the transfer (distribution) of property rights, are clearly shown not to be fully practiced in these regions, thereby causing land degradation.

From these results, another conclusion can be drawn, as this land degradation is a game of winners and losers. As landowners sell their land for extra income or to obtain better returns, both sellers and buyers have some potential gain in this process of disturbance of land. Sellers obtain huge amounts of money at once, and now they can invest this in another business to earn more; buyers have some interest in buying the land. The livelihoods of many people are at stake because of this land degradation, e.g., landowners who use the piece of land adjacent to the degraded site, even though they themselves would not undertake any activity that would cause degradation. Sometimes, landowners who are winners, also suffer as the adjacent land belongs to them, and, in the case of land-use change, they face problems on their remaining plot. Some stakeholders are landowners who have been deprived and do not have enough property rights for these lands.

Thus, land-use change can also harm the land and reduces its productivity, as has been observed in these three regions; the quality of land, because of modifications made by man, decreases, and net output falls over time. This change is in either agricultural or non-agricultural in form. Agricultural change occurs in the form of change of the major cash crop in the region, e.g., the landowners now cultivate wheat instead of rice. However, landowners who use their land for mono-cropping suffer from the problem of low production in the region of the Qadirabad Dam, where agricultural use shows a positive relationship with the land distribution. In the other two regions, multiple cropping has been observed, indicating that multiple cropping techniques are better than mono-cropping in the control of land degradation following land-use change.

Other agricultural use, such as poultry farming or fish framing, give a negative response to the control of land degradation and are not good options for land-use change in those regions where land is already degraded. Although the returns from this business are high in comparison with cultivation, the social returns are very low. However, non-agricultural

options, which are also positively related to land degradation, give good economic returns to the owners. This is because of a lack of planning and poor management for land-use change.

Conflicts between family members, related to land-use change, were tested to measure their response to causing land degradation; they are positively related, as more conflicts between the landowners regarding the use of land cause more degradation on the land. Thus, we can conclude that these conflicts are also one of the reasons for the reduction in the productivity of agricultural land. Finally, conflicts related to land-use change and conflicts related to property distribution were tested, and the results established that both the variables are significant and cause degradation. These results support the second hypothesis of the study, according to which the land-use conflicts and land distribution are the reasons of land degradation in the region.

8.3 Theoretical Conclusions

The findings have shown that an informal institutional setup may require some changes, as culture is the main obstacle to the proper implementation of inheritance legislation. These existing informal institutional settings may not be helpful for the successful operation of the property rights system. This will happen only when the traditions and culture of the area change, as this change is necessary for the solution of the problem of land degradation. With the required change in traditions, the property right system will be brought in to use properly, and land distribution rights will be implemented, which will be favorable for the reduction in land degradation.

The long chain of hierarchies and complex procedure of registration are also hurdles for property rights, as people avoid registering their documents in good time, because of such complicated processes of registration. This delay makes problems for families in the process of transferring land, as many legal owners do not have written information regarding the possession on their land, and others who are the owners of only a limited part of the land or even have no legal rights to this land enjoy all the benefits from this property. An easy and centralized system of registration could cover all these problems related to cadastral and will helpful for increasing the productivity of the land, as every owner has his own private land rights with full authority.

Loopholes of the registration act and transfer acts are also problematic and provide the basis for the conflicts, as non-registration of the important documents, such as a will, irregular

sales, and family settlements. Similarly, strict punishments are also necessary for the donee in the case of divergence from the contract of the power of attorney. These steps might be highly supportive in solving the situations created as a result of conflicts and will help to improve the condition of the land once these conflicts are resolved.

Such loopholes together with the complex system of registration encourage corruption in landowners and in officials in local governance. Thus, revision in the registration mechanism and problematic sections of the law might also be required in order to reduce the corruption in land distribution and its transfer, which are negatively related to land degradation. This will also help in the redistribution of power among landowners, which may become more symmetric, and everyone will get their defined shares in the property.

A comprehensive policy may required in the case of land-use change, according to which private landowners can use their land in the better way in order to maximize their returns and to minimize the social cost.

8.4 Policy Conclusions

A social network or an old local governance structure such as the Panchait (a group of village people who are from the same village and who are considered as being reliable by all the villagers should be redeveloped so that all the matters concerned with conflicts of land could be discussed and solved. In this forum, every person has the freedom to explain his problem and will receive a quick response for the solution of conflicts. This network would be helpful for landowners making decisions about the land and might provide valuable suggestions about land-use change.

A centralized land cadastral system should be introduced, under the supervision of the revenue department of the provisional government, and the present dysfunctional long hierarchy (Patwari, Qanoongo, Tapedar, and Thesildar) should be scrapped and replaced by active and trained manpower, who can deal with all the matters fairly. All land registrations should be updated and checked on a regular basis by the responsible official in the district revenue office.

A penalty should be charged in cases of the registration of property especially for the transfer of inheritance, if a long gap has occurred between the registration of the property and the death of the testator. This would bind the heirs to obtaining registry in their turn. Oral transfers should be avoided.

General power of attorneys should be completely abolished, or if it is necessary to keep this option open for landowners, then heavy surcharges should be levied on for the donee, if the contract is canceled, because of his misdemeanor, before its maturity.

Institutions for planning and development for the land-use change may be required to increase the productivity of agricultural land and the usage of waste land. These institutions should help to utilize the resources at a maximum level, and the nation's agricultural requirement would thus be fulfilled, together with its commitment to environmental protection. Because of the low cooperation between the different governmental institutes, no policy is effective for the security and reclamation of agricultural land. Hence, a proper management system is required that could be developed by the coordination of all concerned departments.

Environmental laws at present play no active role in the protection of agricultural land in the case of private ownership. There is a need to develop a link between these two important variables of the situation, when land degradation occurs. This is necessary for the environmental and economic development of the nation, as agriculture is the major contributor to the Gross Domestic Product of the country.

Landowners are poor and illiterate and have little knowledge about their rights or the best alternatives for land-use change. A relaxed loan package will support them to cover the expenditures for the reclamation of the land, e.g., the installation of tube wells and the purchase of gypsum. Similarly, information about the system and its importance might help them to understand the situation and improve their conditions. They need to be educated about various crops and yields (which types are effective in saline and sodic soil) and about the procedures and precautions to cultivate high-yield crops.

Government policies for infrastructure development also have to be revised, as when they acquire prime agricultural land for their projects, erosion often occurs in neighboring plots of land. Before the commencement of such policies, a detailed review should be carried out by the all relevant departments in order to achieve the best results.

8.5 Possible Future Research

In this study, a theory regarding land degradation was tested in a case of a particular region involved in rice production. In the future, this theory could be tested for other regions suffering with similar problems of land degradation.

Similarly, the theory of land distribution conflicts and land-use change conflicts might be tested for the degradation of environment.

This analysis can further be quantified by taking the area of the disputed land and the value of costs that landowners bear in the whole legal process in case of improperly implemented laws.

9. Summary

Land degradation is a very important global issue because of its impact on world food security and the livelihood of the population. This is a phenomenon involving the loss of the productivity of soil and land. Research provides explanations for land degradation, which is either natural or anthropogenic, with institutional abuse and conflicts regarding land use change being possible important aspects of land degradation.

One objective of this study has been to analyze the involved institutions, particularly with regard to property rights related to land ownership and estate distribution as a cause of land degradation in the study regions near Gujranwala, Pakistan. Another aim of this study has been to hypothesize that land use change conflicts, which are related to these property rights, also cause the degradation of land.

To attain the aims of study, it was necessary to define the concepts of land degradation, as a study problem, together with some other terms, such as land. *Chapter 2* provides an explanation of these concepts and a discussion of different reasons for land degradation at the world level and particularly in Pakistan, with references to the available literature. I found various natural factors that usually cause land degradation, for example, erosion of the soil, waterlogging, salinity, and sodicity. Similarly, I also studied man-made modifications causing land degradation, such as over-cultivation, mono-cropping, desertification, city expansion, and institutional mal-functioning.

A study of the literature revealed that land at the world level is mostly degraded by the human involvement in biodiversity. About two hundred million hectares of the world has been lost, because of land degradation through overgrazing, deforestation, and various agricultural activities. Approximately, eight percent of the cultivable land has been destroyed, because of urbanization and industrialization.

From the literature, three main reasons of land degradation in Pakistan have been discussed. 1) Natural disasters and climate change, 2) Direct causes, and 3) Economic and social conditions. My major focus is the last point, which includes population pressure, poverty, institutional setups, and non-agricultural land use change. This review of the literature has led to the idea that the country has not benefited from its program of institutional reforms, which is one of the root causes of wastage of arable land.

Much literature is available regarding the importance of institutions to save and reclaim agricultural land in order to avoid food shortages at the world level. However, very little research in this field has been conducted in Pakistan. The result of this examination has motivated me to analyze the land property rights with respect to land degradation in the north east region of Pakistan, which is very famous for its rice production, whose output has for the last ten years continuously declined. Various studies are available on the institutional importance and role of property rights in land degradation in Pakistan, but no one has worked on the land distributional conflicts among heirs; these are very common in Pakistan as a cause of land degradation. My study has filled this gap.

For the institutional analysis of this study, several additional related terms have needed to be clarified, such as the relevant institutions in Pakistan, property rights, transaction costs, land use change, and conflicts. In *chapter 3*, these important terms are explained, and the institutions are defined for this study as given by Knight (1992) as the expected attitude of the people in a particular situation.

In this chapter, some related theories, i.e., the distributional theory of institutional change presented by Knight (1992) and the theory of property rights in cases of conflicts presented by Alston et al. (2000), are reviewed, and the links of these theories to the study problem are presented. My findings are based on the analytical framework 'Institutions of Sustainability' proposed by Hagedorn et al. (2002). The problem has been explained on the basis of the four different aspects of this framework; 1) the characteristics of land as transaction goods, 2) the characteristics of actors involved, 3) the local social arena, which is the result of these characteristics of the land and actors, and 4) the institutional settings, which comprise land property rights and local governance structure.

With the help of these proposed frameworks and theories, I have derived two hypotheses for my study; 1) intergenerational land distribution creates problems not only in social terms, but also in mismanagement and resource degradation; 2) because of improper management and lack of planning, land use change conflicts together with difficulties in land distribution cause land degradation.

The data for this study are qualitative and have been collected through a field survey of the selected regions of Pakistan. For this, a case study approach was followed, as suggested by Yin (1994). *Chapter 4* outlines this methodology, in which the hypotheses have been linked

with the empirical observations and the research questions. These observations are the results of interviews undertaken with land owners and land users and have been cross-checked from other sources of data collection, such as interviews from related people, document studies, personal observations, and photographs.

The unit of analysis is the household, each of which has been selected through the sampling of the selected region. Regions were selected on the base of the quality of soil, through the previously published data of the soil fertility survey, and from statistical bulletins. These regions were categorized as: Case study 1 (Shaikhupura-Kamoki Region) with a medium level of land degradation, case study 2 (Qadirabad Dam region) with a high level of degradation, and case study 3 (Nandipur region) with a low level of land degradation. From these regions, twenty villages were selected on the basis of the distance from the main road and the quality of land productivity. Open forum discussions were conducted in all these selected villages, and then households were selected through stratified sampling.

In the second part of this chapter, a detailed description of the selected regions is given. In this description, those characteristics of the land are clearly mentioned that are an important part of the study and applied framework.

For the institutional analysis of the regions, it was necessary to be thoroughly acquainted with the institutional setup of the country. For this, various laws were studied and are reviewed in *chapter 5*. For an understanding of the structure of land property rights, the following legislation was reviewed; 1) the transfer of property act, 1882, 2) the registration of property act, 1908, 3) the Punjab land revenue act, 1887, 4) the Stamp act, 1899, 5) the Land acquisition act, 1894, and Law of inheritance.

Some points from these laws were derived; for instance, the transfer of property act (1882) allows oral transfer. According to the registration of property act (1908), family arrangements and compromises, and sales agreements can be optionally registered. Similarly, the will of a testator also does not need to be registered during his life, and after his death, there is no specific time for this registration. The Stamp act (1899) explains the process of the power of attorney. Finally, the inheritance law explains the distribution of the property among heirs. Through this law, the testator can leave only one third of his property according to his will, and the remaining two thirds will be distributed by the conditions of the law. In this law, sharers and residuaries are explained clearly, and also the levels of these share holders are

specified. If there is no first level sharer, then the property will automatically be transferred to the next level, but in case of existing sharers, they are the legal heirs.

Institutional abuse in the specific study regions has been discussed in chapter six and seven, which are the empirical chapters of the study. In *Chapter 6*, the implementation of the inheritance law and land distribution in the study region is explained through the various land distribution patterns observed in the region. Most of the families have a culture favouring the non-distribution of land, and because of this culture, the care taker had become more powerful and has misused the relaxations of laws. Different situations were observed, 1) land was not distributed and one member of the family was the caretaker of the whole estate, 2) land was orally distributed, so land was not legally transferred to the next landowners, and 3) land was legally transferred to new landowners, but because of their personal problems they hired attorneys for the look after their land. In all these situations, land was degraded. The results of empirical finding of the relationship between land distribution and land degradation are given as a negative relationship between the three variables; land distribution among heirs, land transfer, and land degradation. The negative impact of first two variables shows that, if land distribution does not occur properly, then more land will be degraded. This relationship was observed in all three regions.

In the next part of this chapter, land distributional conflicts are discussed, and a positive relationship has been found between these conflicts and land degradation. Some real life case studies are also discussed and explained. Most of these conflicts occur because of the improper implementation of inheritance laws and take a long time to reach settlement. Finally, the joint effect of intergenerational land distribution, of the transfer of land among heirs, and of the distributional conflicts on land degradation were calculated. According to the results of this analysis, my first hypothesis was accepted that intergenerational land distribution causes land degradation.

Chapter 7 explains the effects of land use change on land degradation. In this chapter, various options for land use change, observed in the regions, are discussed, for instance, agricultural use, housing, industrial, CNG filling stations, hotel and marriage halls, fish farming, poultry farming, and government acquisition. I found the relationship between the response of the landowner 1 and landowner 2 for these options and land degradation. The results show that, in the first case study region, the choice of landowner 1 is more problematic

as compared with the choice of landowner 2. In the second and third case studies, the choice of the landowner 1 has fewer bad effects in comparison with landowner 2.

To verify these results, the efficiency of an individual option was calculated with reference to the land degradation. In the Shaikhupura-Kamoki region, agriculture was found to be a healthy option, whereas housing was shown to be the worst option for the land of the region. Industry and government acquisition were two other options that were supportive of land degradation in the region. In case of Qadirabad Dam region, no option of land use change was favourable, and current agriculture practice was established as the main reason for the land degradation. Other poor options were housing and fish farming. Industry, hotel, and marriage halls and poultry farming also have unfortunate impacts, but to a lower extent than the other three options. In the Nandipur region, the limited options available for land use and agricultural use have proven to be best, whereas industry and government acquisition are not good for the land of the region.

All these options are subsequently discussed in detail, and statistics obtained through a survey of the regions have helped in the understanding of the results of the efficiencies. Finally, for the testing of the second hypothesis, a relationship between land use change conflicts, land distribution conflicts, and land degradation has been found for all the three regions. The results of these relationships show that these conflicts have a positive impact on land degradation and are a cause of land degradation.

In *Chapter 8*, some empirical and theoretical conclusions are drawn from the present work. Empirically, it has been found that more land was degraded in the regions where land was over-utilized. Because of the strong cultural setup, land was not properly distributed and caused conflicts between landowners. Most of these conflicts arose because of illiteracy and unawareness of the rights of the individual. Wealth and culture supported the male member of the family who was responsible for the care of land. He used the relaxations of law in his favour, often ignoring the land and trying to obtain greater benefit for himself. For such purposes, he used the land for non-agricultural options, which is one of the main causes of land degradation.

Theoretical conclusions are drawn on the basis of informal institutions, such as the culture of the region. Some other conclusions are attained by finding the root cause of the problem, i.e., that people do not want to obtain a new cadastral system because of the lengthy hierarchy

of the system. Some loopholes in the laws should be amended, like non-registration of some important documents.

Finally, some policies are recommended for the solution of the problem, such as changes in local governance structure, together with a strong policy for land use change. A new centralized cadastral system needs to be introduced, and then a penalty should be levied on the landowners who do not submit their latest documentation in time. General power of attorney has been observed as being problematic, so in policy recommendations, it is suggested that it should be abolished.

During this study, institutions for the development and planning of land-use change have bee found to be missing, and so they are strongly recommended to be established according to the need and requirement of the regions. Similarly, government policies for infrastructure development equally need to be revised. Landowners and land-users are both required to undertake special training and education for land utilization in the best way.

Further research could make use of this theory for other regions suffering with land degradation problems and environmental degradation. Quantitative analysis can also be performed with regard to the disputed land and the costs that landowners bear in the case of the improper implementation of laws.

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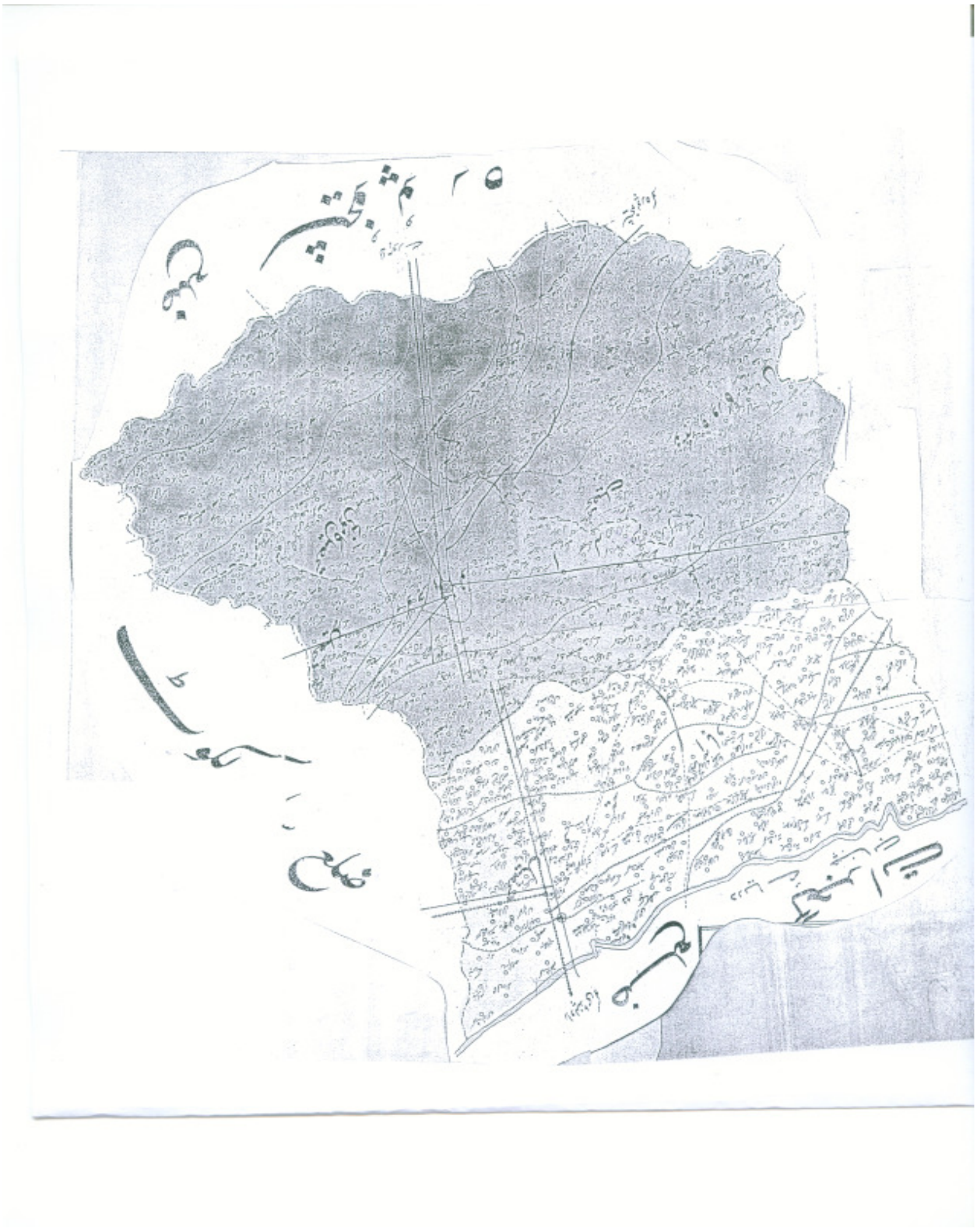
Appendices

Appendix 1:

Complicated Patwari's Map for the Region SKR



Appendix 2:

Complicated Patwari's Map for the Region QR

Appendix 3:

Complicated Patwari's Map for the Region NR

Appendix 4:

SPECIAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS that,

I_____s/o_____

___ adult, holding CNIC _____R/o

_____

_____ appoint,

Nominate and constitute _____s/o

_____ holding CNIC _____ R/o

_____

_____

__,

to be my true and lawful attorney in my name and on my behalf to do and cause to be done the following acts, deeds things and matters and to execute and enjoy the following powers and rights:

1. To supervise manage and look after all over interest in the above said case.
2. To contest the case MRC No. 2193/85 and to deposit monthly rent in the Court on our behalf.
3. To appear in the Civil Court appellate, provisional and before all relevant Courts and to file such applications and make such statements as may be deemed necessary and expedient in the Court.
4. To sign, verify, execute, present, attest and prosecute the above mentioned case and to file plaints petitions applications revisions appeals statements, objections, affidavits, as and when necessary for the proper at jurisdiction of the property involved in the above mentioned case.
5. To receive notices from Courts are Government offices and to attend all judicial, non-judicial or extra judicial proceedings in which our participation or attendance may be necessary.
6. To file documents papers in Court and receive them.
7. To summon witnesses and examine them on our behalf and also cross-examine witnesses produced against us.

8. To make statements, and file affidavits and give evidence on our behalf in all matters, cases proceedings in any Court or tribunal.
9. To contest and defend suits, applications cases and matters that may be filed are pending in the Courts has mentioned above.
10. To represent us in all matters and affairs relating to the aforesaid case and to make any application in our name and on our behalf pertaining to the above mentioned case

And Generally to act in relation to our said case as fully and effectually in all respects as our selves could do and that whatever our said Attorney for the time being acting under or by virtue of these presents shall lawfully do or cause to be done, we, the above named executants do hereby agree to ratify / allow and confirm the same.

IN WITNESS WHEREOF I, have set and subscribed unto my hands at _____ on _____.

WITNESSES:

1) _____

2) _____

EXECUTANT: ATTORNEY:

_____ _____

Appendix 5:

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS that, Name of Donor _____-

_____

_____Address of Donor_____ undersigned do hereby appoint, Nominate and constitute

Name of Donee _____ Address of Donee _____ to be our true and lawful attorney in our name and on our behalf to do and cause to be done the following acts, deeds things and matters and to execute and enjoy the following powers and rights:

1. To take control management and supervision of all matter concerning along with installation, equipment with the above said property.
2. To accept, receive, realize, recover all money including rents, emoluments that may be receivable by me and to give a valid discharge thereof and in like manner to make payment of money payable by me, including taxes, surrender any of my money to any other person or persons who may entitled to receive the same from me.
3. To appear and apply in before all Civil, Criminal, Revenue Courts before all Government, Revenue, Income Tax and all other Office/Offices and to presents, file, defend, oppose, made compromise, answer, reply all proceedings, they are authorized to withdraw any suit pending, demands, requisitions or claims that may be instituted against me and on a similar manner to institute against me and in a similar manner to institute Demand, Requisitions, Claims, Applications, Petitions, Appeals, Revisions and other proceedings in respect of any of my right relating therein.
4. To Sell, Transfer Assign, Convey, Let, Mortgage, Pledge the above said property for the purpose of clarification wherever the context my properties or similar expressions

in the following clauses would mean only the above SAID PROPERTY and including installed equipment at the above said Flat.

5. In case of death, serious disease, physical or mental disability of one of the Attorneys, the other one who is also co-attorney will do/perform, all the acts, deed on my behalf and I will bind all of his acts and deeds.
6. That once such genuine purchaser/buyer is sought attorney shall have the power to execute Sale Deed or any relevant document in this connection and shall finalize mode of payment.
7. To appear before any Registrar/Sub-Registrar and present documents for registration and also acknowledged execution for me and on my behalf of any agreement, conveyance, mortgage and receive the money on my behalf and give valid receipt thereof.
8. To enter into contracts and agreements on my behalf in respect of sale of the above SAID PROPERTY and to perform, complete and enforce performance of the said agreements and contracts and to execute all necessary deeds, documents and writing in that behalf.
9. To delegate any or all of their powers, functions and duties hereunder to any other person or persons and all acts of the said Attorneys or Attorney(s) so appointed will be binding upon me as if the said Attorney(s) or Attorneys was/were appointed by me.
10. It is also specifically stated therein my said Attorneys will exercise the powers contained herein, in their absolute discretion without any let hindrance or objection or obstruction from any person or persons claiming for and/or through me.

AND GENERALLY to perform and execute all the lawful deeds, acts and things which my said attorneys will do fit for the due and proper exercise of my right in all matters connected therewith and incidental thereto**.**

AND I do hereby ratify and agree to ratify and confirm that all acts, deeds, things and matters that my said Attorneys may lawful do in respect of my all rights or cause to be done under or by virtue of these presents.

IN WITNESS WHEREOF I, have set and subscribed unto my hands of the day -

_____

WITNESSES: EXECUTANT:

1._____ _____

SPECIMEN SIGNATURE
OF THE ATTORNEY:

2. _____

_____ _____