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DO PRIVATE PROPERTY RIGHTS HAVE AN EFFECT ON FARMERS' INCENTIVES FOR SOIL CONSERVATION?

-A case study on Georgia

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Abstract

Soil degradation has developed into a global problem that threatens food security of millions of people by annually causing serious damage and lowering productivity of hundreds of millions of hectares of arable land. Soil conservation measures that are aimed at abating or preventing various types of soil degradation can thus hold one of the keys to solving the worsening global food crisis. This paper examines one of the several factors that induce a farmer to invest in soil conservation measures - the property right. Aim of this study is to identify the elements of a property right that actually induce the farmer to undertake soil conservation. The topic was investigated by comparing two different property rights regimes: the Soviet permanent user right system applied on private household plots and the private property rights enforced in Georgia since 1992 after the privatization of agricultural land. Results of the study reveal that both of the economic systems provided essential incentives for undertaking soil conservation measures. According to the study, the necessary conditions are a possibility to raise income from land and to pass the land on as heritage. The privatization should also be widely accepted by the community because it creates legitimacy for the established private property rights.

Key words: private property rights, soil conservation, incentives, Georgia

Word list

Soil conservation:

Soil conservation can simply be defined as protection of soil against erosion and deterioration in order to maintain soil fertility and productivity (OECD).

Soil degradation:

Soil degradation refers to the process that lowers the soil's ability to carry out its ecological functions such as supplying air, water and nutrients, supporting roots, providing a biological habitat and a gene reserve. Deterioration of soil quality occurs either in form of physical or chemical degradation, or as a result of soil material having been removed by wind or water, which is generally referred to as water and wind erosion. Causes of chemical deterioration include salination, acidification, loss of nutrients and soil contamination by hazardous waste, fertilizers and pesticides. Physical degradation is caused by compaction and water-logging (Ballayan, 2000, p.7).

Permanent user right:

Permanent user right were often granted for such purposes as personal garden plots or individual housing construction. A permanent user right provided the holder the same rights and responsibilities as well-defined property rights granted in the capitalistic societies, except for the right to sell or purchase land. Temporary user rights were similar to land leases in capitalist societies (Ford et al., 1998, p.45-46).

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1 Introduction

Overcoming environmental problems in agriculture requires a thorough understanding of individual resource users' private incentives and ways to manage resources more successfully from a society's point of view. Many factors influence private incentives for managing resources, including information, prices, subsidies, interest rates, market access, risks, technology and collective action. One factor that plays a significant role in inducing a farmer to undertake conservation measures in order to battle the damage on environment caused by agriculture, and the topic of this paper, is property rights. A former Soviet country Georgia was chosen as a subject of the study due to the extent to which permanent user rights - the Soviet equivalent of private property rights providing the very foundation of a market economy, were applied there during the Soviet times. In addition to, the chosen privatization strategy has led to predominance of private farming which creates a perfect setting for doing research on incentives provided by the current private property rights on private farmers' soil conservation incentives. Since a large part of the population is dependent on agriculture as a source of livelihood, incentives for soil conservation that are related to soil productivity have important implications for reducing poverty in the entire country. Reduced productivity of land can influence an entire region's food security.

1.1 Background and problem definition

Georgia makes an especially intriguing case for investigating the role of private property rights for creation of soil conservation incentives. Two distinct features suggest that the property rights system that was applied on private household plots in Soviet Union was more advanced in Georgia compared to the other Soviet republics. First of all, collectivization of agricultural land was never implemented as thoroughly in Georgia as in other republics which resulted in that Georgian farmers held the largest share of agricultural land in de facto private ownership. However, the scale of private farming should not be exaggerated. Most of the commercial agriculture was still carried out in large-scale in 1100 kolkhozes and 650 sovkhoses with means of centralized management. During the Soviet era and even long before incorporation

of Georgia into the Soviet Union, agriculture was one of the leading sectors of Georgian economy thanks to the favourable and diverse climate and fertile soils (Beruchashvili et al., 2002, p.5). Georgia was the main supplier of selected agricultural products such as grapes, citrus and tea to the entire Soviet market (Government of Georgia, 2009), which required a high degree of specialisation for these specific goods. Soviet agriculture is generally described as inefficient and resource intensive which imposed high pressure on the environment. Environmental constraints arose from intensive usage of irrigation and excessive use of mineral fertilisers and pesticides which reached maximum levels in the 1980s. Georgian soils were seriously degraded when the country gained independence in 1991 (Beruchashvili et al., 2002, p.5).

Secondly, Georgian peasants *always* enjoyed the exclusive right to farm small parcels of land, normally 0.25 ha, for household production (Felloni, 2007, p.2). However, the Soviet authorities' general attitude towards private farming varied. Until the beginning of 1970s, citizens who sold their privately produced crops in the market were labelled in the press as speculators and garden plots were even bulldozed. As food shortages showed no sign of relief, the Soviet leadership was forced to relinquish control over private economy. In 1978, propaganda to encourage private farming in all its forms, whether it be the personal household plot of a kolkhoz worker, the garden plot of a city dweller or an enterprise farm, was finally intensified (Rumer, 1981, pp. 562-563). The possibility of selling private agricultural production came to play an important role for soil conservation incentives, as well as the Soviet authorities' attitude on private farming as will be discussed in section 4.2 *Permanent user rights of personal household plots in Georgian Soviet Socialist Republic*.

A transfer from the Soviet system of permanent user rights to private property rights was officially launched with the privatization of agricultural land in 1992. Guidelines for a rapid land privatization and market liberalization were drafted by the experts of World Bank and International Monetary Fund in the turmoil of disintegration of Soviet Union (Spoor, Visser, 2001, p. 885-886). Transfer of agricultural land from the state to private actors took place in several stages and the process itself plays a role in creation of soil conservation incentives (see section 4.6.1 *Quality of title*). In addition to allocation of land, establishment of private property rights requires passing laws that on one hand protect a property holder's rights regarding use of their private property but also set certain boundaries for land use. Limiting

user rights on land essentially violates a few important aspects of a private property right and will be discussed in a later chapter of the paper. Establishing well-defined property rights is considered by neoclassical economists to provide a fundamental economic incentive for the property owner to maximize the utility received from his or her property, agricultural land in this case.

Several factors that may have an impact on farmers' soil conservation incentives have already been named. They will be analysed in great detail in order to investigate if they have induced the respondents to apply more environmentally sound land management measures. The relatively small amount of land area that is suitable for agriculture makes investigating incentives for soil conservation measures even more urgent. The current Georgian territory is stretched within 6 949 000 hectares, of which 44 percent is agricultural land and the rest is covered by mountains, forests and water bodies (Thomas, 2006, p.234). Considering the environmental impact of all land management decisions before their implementation is of utmost importance also due to the significant degree of soil degradation (see Word list for an explanation of the term soil degradation) observed on the agricultural lands in Georgia today. The country's climatic and topographical conditions make Georgia a particularly exposed region to such natural processes as erosion and salination. Erosion has caused the most damage on Georgian soils and there has been an increasing trend during the past years. Short-sighted and unwise farming practices is another significant contributor to soil degradation. In Georgia, soil salination is caused by inappropriate irrigation methods, while acidification is a result of using acid-forming nitrogenous fertilizers. Misuse of pesticides and mineral fertilizers, oil spills and uncontrolled disposal of waste have led to soil contamination (MEPNR, 2010, ch.8). Loss and degradation of the productive topsoil has been enabled by unsustainable farming practices such as intensive cultivation, wide-ranged logging and over-pasturing which gradually reduce humus and impoverish soil from nutrients and organic matter. According to the data of Ministry of Agriculture from 2006, 58 percent of the total arable land in Georgia is degraded: 250 thousand hectares of soil are salinated (6,7 percent of the total arable land) of which 59 thousand hectares are seriously salinated, 300 thousand hectares are acidic (11 percent of the total arable land), 210 thousand hectares have turned into marshed soils (7,3 percent of the total arable land) and 1 million hectares are eroded (33 percent of the total arable land). These areas are categorized as low-yield agricultural land, either of medium or low productivity, due to the extensive damage caused by degradation

(MEPNR, 2006, p.4). Effects of soil degradation are often expressed in terms of reduced productivity of land because soil degradation is recognized as a major cause of falling agricultural productivity around the globe. Productivity of land has therefore strong implications on livelihood of the large Georgian rural population.

Since rural poverty rate is estimated at 41,7 percent and the income difference between rural and urban settlements continues to increase, agriculture and productivity of land in particular play a crucial role in reducing poverty. A large share of the total national workforce, 55 percent according to data from 2008, was employed in agriculture. Agricultural sector remains crucial for the Georgian economy by providing basic subsistence for the rural population although its share in nominal GDP accounts has decreased significantly. In 2006, agriculture contributed merely 13 percent to the country's total GDP which is a notable drop from 32 percent in 1990. Taken into consideration the apparent significance that agriculture plays in providing subsistence livelihood for rural population the government efforts to develop the sector can not be described as anything but insufficient. Government has made clear its development intentions for agricultural sector by prioritizing development of agricultural infrastructure such as irrigation and drainage systems, supporting viticulture and promoting food quality and safety. All of these measures have been primarily directed to strengthening competitiveness of Georgian agricultural products in international markets and creating favorable conditions for agricultural businesses (Davis et al., 2008, p.10-11). Besides improving irrigation, environmental impacts of agricultural activities have not received much attention from the government which makes the analysis of farmers' incentives for soil conservation increasingly topical and urgent.

1.2 Purpose of study

Aim of this study is to investigate if private property rights have an impact on farmers' incentives for soil conservation. Private property rights currently enforced in Georgia as well as the permanent user rights practiced in the Soviet times will be scrutinised and compared in order to find out which elements of property rights are crucial for providing incentives for soil conservation. The effect of private property rights on farmers' soil conservation incentives is

investigated with the support of the following questions:

To what extent did the property rights over personal subsidiary plots in Soviet Union fulfill the elements of private property rights of a capitalist economy?

How do respondents perceive the private property rights currently enforced in Georgia?

Do respondents think that their the receiving a private ownership over land has had an effect on their land management decisions?

1.3 Disposition

The first chapter is largely devoted to background and problem definition which outline the peculiarities of the Georgian case. Issues, such as the current condition of soil and agriculture, will be addressed in order to present the topic and related matters. The second chapter consists of a detailed description of how the field study was conducted and motivation to a number of decisions I made during the research, such as choice of method and selection of respondents. In the third chapter, the theories applied for analysis are described in considerable detail. Theoretical framework is followed by analysis where the Soviet system of permanent user rights as well as the currently enforced private property rights are described from the respondents' perspective. Final conclusions are drawn in the final chapter.

2 Method and material

2.1 Method

2.1.1 Qualitative research method

There are several reasons for choosing qualitative research method as the primary research method for collecting material for the thesis. A qualitative research method is considered appropriate when the research is aimed at investigating a phenomenon that has not been studied much (Esaiasson et al., 2003, p.280). Despite my diligent search I was not able to find any previous study specifically aimed at effects of privatization on farmers' incentives. The closest match is the study by Wei Hu, in which the links between the Chinese reformed land tenure system and environmentally unsustainable farming and land degradation are investigated. However, his study is not much help because in China's case ownership of land is ambiguous between the state, collectives and farm households (Hu, 1997, p.176). On the contrary, in Georgia all the traces of collective farms have been destroyed and the state does not interfere in private land management decisions (see section 4.6.1 *Quality of title* for an analysis of relations between farmers and the state). The only research paper that investigated Georgian farmers specifically was focused on the progress of land privatization process and its impact on the development of agricultural sector and living conditions of rural households (Gogodze et al., 2005). There was no material available on the way that farmers' perceive their private property rights. Therefore I consider my field of interest as a relatively new research field.

Carrying out a quantitative study and collecting statistical data requires categories to be determined in before hand, while a qualitative research is aimed at finding out which categories are relevant in each particular study. A quantitative research method is therefore sometimes applied in pilot studies for carrying out a statistical study at a later stage of the research process (Esaiasson et al., 2003, p.280). The six characteristics that a private property right must fulfill according to Scott (2008, p.5) in order for a property right to be considered as complete could be argued to serve as categorization for a statistical study. However, the set of

six elements that comprises of exclusivity, duration, quality of title, transferability, flexibility and divisibility merely provide a theoretical framework which is tested in the paper. Results of the interviews show that few of the six elements are irrelevant for the purpose of this paper and have to be modified, as often is the case. Semi-structured interviews also leave room for the development of the theory, perhaps even an unexpected discovery of new categories.

Qualitative method is recommended also when the purpose of the study is to reveal how interviewees view their own world (Esaiasson et al., 2003, p.281) which is precisely the purpose of my paper. Farmers' descriptions provide a necessary tool for investigating how private property rights are perceived on the grass-root level by the group of people whose daily life is affected by the privatization.

Purpose of the paper is partly to test the fundamental neoclassical hypothesis, according to which private property rights is a necessary assumption for people to invest in soil conservation. Although quantitative studies are generally applied more for this purpose the qualitative is seen as a more appropriate method when the topic is particularly complicated (Esaiasson et al., 2003, p.283). Strength of the chosen method was that when the respondent' answers did not support the theory I could ask follow up questions right on the spot in order to find out the various reasons to why the theory did not hold. My expectations for the interviews were that the study would not turn out to be as simple as expected, since reality seldom reflect models, and by applying the qualitative research method I wanted to have the chance of getting more information on the spot. Such an approach was a necessity due to the restrained time frame for the field study. Selecting appropriate respondents for a statistical study, contacting them, handing out the questionnaires, collecting them again and going through the results would have been an arduous and time-consuming task which might not have left much time for the follow up interviews of a quantitative sort.

2.1.2 Choice of the target country

Georgia was chosen as a topic for the field study because share of land occupied by private plots is by far the largest in Georgia from all the former Soviet countries, according to data from 1998 (Spoor, Visser, 2001, p.890-891). This is a result of the privatization strategy

implemented in Georgia while other strategies chosen in other former Soviet countries led to very different outcomes (Spoor, Visser, 2001, p.890-891). During the first phase of privatization 56 percent of previously state-owned agricultural land in Georgia was transferred to private ownership, partly through lease (Thomas, 2006, p.234-235). That is considerably more than the equivalent figure 16.7 percent for Moldova which had the second largest share of private plots in the former Soviet countries (Spoor, Visser, 2001, p.891). Despite diligent search I was not able to find a more recent comparison of post-soviet countries. Dominance of households is nevertheless supported by statistical data from 2009 published by the National Statistics Office of Georgia. Family holdings, defined as production units operated by a household (National Statistics Office of Georgia, 2009, p.11), account for a majority of production of all agricultural products. The share of family holdings of the total area cultivated has increased from 93.6% in 2006 to 97.2% with the corresponding fall in the share of land held by agricultural enterprises. Family holdings produce an average of 98 percent of all annual crops such as grains, potato and vegetables, 97.4 percent of fruit and grapes, 99.9 percent of citruses, 70.7 percent of tea leaves, 90.9 percent of meat, 98.9 percent of milk and 99.5 percent of honey (National Statistics Office of Georgia, 2009, p. 32, p. 34, p. 37, p.69). The remaining share of agricultural goods is produced by agricultural enterprises which refers to individual entrepreneurs, cooperatives and joint stock companies whose activities are regulated by the Law of Georgia on entrepreneurs (National Statistics Office of Georgia, 2009, p.11). When incentives provided by private property rights are a matter of investigation and the share of privately owned land is large, results of the research have implications for a relatively larger share of the total arable land. This increases relevance of the study.

Selection of a target country was initially limited to the post-Soviet countries from several others countries that have had a Marxist regime due to my personal interest for the region. The two years I have preciously spent in the region and the knowledge that I have gathered were an advantage for conducting qualitative interviews. The field study was carried out in Samegrelo region situated in Western Georgia where I have personal contacts which facilitated creating contacts with local farmers.

2.1.3 Choice of theory

I chose to use Scott's analysis of property rights because the private property right is broken into so many components and thus the theory makes a convenient tool for understanding a situation where a property right may be characterized by only a few of the required elements. Since some of the characteristics of a private property right of a market economy is expected to be absent in the Soviet system of private ownership of resources, Scott's model is appropriate for the analysis. In addition, Scott's analysis is developed specifically for property rights of natural resources which is the topic of my paper. However, two elements of private property rights, flexibility and divisibility, are not applicable for my study. They are excluded because they go into such details of property rights which, I believe, would not bring any crucial further insights into the analysis. In addition, I suspect that the respondents' somewhat low level of knowledge of the exact content of their private property rights would have imposed a hinder on receiving satisfactory answers. Flexibility and divisibility partly deal with the relationship between a land owner and a land user when they are not the same person with respect to land uses such as fishing, logging, mining and hunting (Scott, 2008, p. 7, 10-11). However, none of the respondents leased their land to any external land user, and their land uses were limited to crop cultivation, growing small amounts of bushes for firewood for the households' own use and in one case pasture. A theory of off-site costs is added in the analysis (section 3.2 *Property rights*) in order to reveal farmers' awareness of their obligations towards the society.

2.1.4 Selection of respondents

In qualitative interviews the goal is to capture all the different ideas and perceptions on the subject of study, in this case on impact of privatization on soil conservation incentives. When the interviews do not reveal any new aspects to the research topic a theoretical saturation has been reached and the researcher can draw conclusions. In order to reach a theoretical saturation, a strategic selection of respondents is carried out by choosing respondents whose individual characteristics relevant for the study reflect a maximum variation (Esaiasson, 2003, p.256). Only farmers who had farmed a household plot in the Soviet times were included in

the study in order to investigate the impact of privatization. The relevant characteristics taken into consideration in the selection process were: how much agricultural land the respondent currently owned or leased, their level of agricultural training, if respondents had observed changes in soil quality on their own land and thus experienced a need for soil conservation measures. Respondents' level of agricultural training or a previous career at a kolkhoz which had exposed them to large amounts of information on farming methods were expected to give more varied results on soil conservation. Since land plots assigned for private farming in the Soviet times were relatively small, a large piece of land currently in private ownership must have been acquired by applying different privatization procedures. Theoretical saturation was reached after fourteen interviews which follows the recommendations for a suitable number of interviews. According to guidelines, from five to twenty-five interviews are generally required in order to make an interesting analysis (Esaiasson, 2003, p.286-287).

2.1.5 Respondent interviews

All the interviews were carried out with the household member who was in charge of the decision-making on farming activities. Interviews were carried out with the help of an interpreter who interpreted from English to Georgian and back to English. Using an interpreter always creates a risk with truthfulness and accuracy of translations. My interpreter had hardly any previous knowledge on soil quality, conservation measures and privatization of agricultural land. I doubt she ever really understood the exact purpose of my study which reduces the risk that she would have modified respondents' answers according to what she thought I preferred. My interpreter had developed excellent social skills during the ten years she had worked at a local NGO which I believe facilitated in creating a trustworthy atmosphere in which respondents felt comfortable opening up. One of the interviews was interrupted and never completed, although luckily towards the end of the interview guide. I did not mention the chance of concealing the true identity of respondents since all of them were willing to give an interview without such a promise. Most of the respondents were quite taken by the interest from a foreign student since they generally receive very little attention from the local authorities.

Material was collected by applying semi-structured interviews which are meant to create an interactive discussion between the interviewer and the interviewees (Esaiasson, 2003, p. 254). An interview guide (see Appendix) served as a basis for all the interviews although the exact formulations and even the content of the questions was modified according to how each conversation developed. The fact that questions were quite unstructured turned out to be a challenge in gathering information because respondents did not react by giving long descriptions of their own experiences of property rights. I'm convinced that this depends partly on the fact that the respondents were generally not very well-endowed with information on the exact content of their holder right over land. On few occasions, respondents replied with a very general answer so that it was necessary to add a more specific follow-up question. One such question was aimed at revealing respondents' observations of soil degradation on their land analysed in section 4.4 *Respondents' knowledge of soil degradation*. In several cases respondents were unable to give a more detailed answer when asked to do so, for instance on the question why some respondents felt insecure of enforceability of property rights in the future. However, respondents relative lack of knowledge did not reach such proportions that it would have hindered conducting a study on the topic. Analysis of this paper is to a large extent supported by quotations. These quotations are translations from Georgian and thus not real citations.

2.2 Material

Data used in this paper consists of semi-structured interviews, scientific articles and internet sources. Finding scientific articles or just any material in the internet on soil degradation and privatization process in Georgia proved to be quite a challenge. In order to form a more profound understanding on these issues I conducted interviews in the capital city Tbilisi at a local non-governmental organization Elkana - Biological Farming Organisation, Georgian State Agricultural University and three ministries, (Ministry of Agriculture, Ministry of Environment and Natural Resource Protection and Ministry of Economic Development). Elene Shatberashvili, the representative of juridical department of Elkana, provided me with detailed information about the different phases of privatization process which has been used as a primary source for the description of the second and the third phases.

In Zugdidi I conducted interviews at a local NGO Farmers' Union and a local branch office of an international NGO Action Against Hunger in order to receive information on the local farming conditions. In addition, I visited the Scientific-research institute of tea and subtropical cultures of Anaseuli where I learned little about soil degradation in Samegrelo region. All the preparatory interviews named above were carried out either in English or in Russian without an interpreter. Respondents' interviews were carried out in five villages in Samegrelo region situated not far away from the city of Zugdidi: Akhali Abastumani (Jura, Pridon), Tsalendjikha (Lia, Murman, Gulisa, Eliso, Nana), Rukhi (Nugzari, Enguri, Eka), Koki (Zauri, Valerian), Akhalsofeli (Gogi, Ia).

3 Theoretical framework

3.1 Privatization

The term privatization can refer to many different types of transactions. Broadly defined it means a transfer of responsibility for a specific function from government to the private sector. The most common application of the term is a shift, either by sale or long-term lease, of a state-owned enterprise to private actors (Poole, 2007) which is also the focus of this paper. If the term is applied specifically on land issues, it can also refer to creation of land titling and registration systems (Lerman, 2008, p.393). An extension of the term privatization is decollectivization that can be defined as “the conversion of state and collective farms into either private (corporate or individual) farms, or tenant farms with long-term leases, or genuine producer cooperatives” (Pryor, 1992, p. 265). The term collectivization is often used to refer to the privatization processes in former Soviet countries. The decollectivization strategy chosen by Georgia is supported by Pryor (1992, p. 265). In his opinion, disintegrating large farms into small production units instead of large agricultural corporations (joint ownership) has contributed to the development of stable property rights over agricultural land even though the process itself might be more complicated. Workers holding stocks in corporations have not been able to influence the farming routines and farmers feel themselves reassured only when they have a legal right on a piece of land, rather than a shares of an obscure form of joint ownership (Pryor, 1992, p.265). Spoor and Visser point out that family-based peasant farms have not proven to be more productive and efficient than larger production units, as initially was expected (Spoor, Visser, 2001, p.898). Advantage of the privatization strategy chosen by Georgia is that is resulted in a large share of agricultural land held by private farmers which is also the reason why Georgia was chosen as a topic of this study.

3.2 Property rights

The essential goal of privatization is assigning property and resources, in this case land, to private ownership. If the privatization process provides the outer framework for enforcing private property, the property rights give the holder an exclusive right to decide on how the resource is being used. They can be handed over either to an individual as in market economies or to a state like in socialist societies. A system of complete property rights is generally acknowledged as the very foundation of a capitalist system (Alchian, 2008) and the theoretical basis for private property rights was laid in Adam Smith's *Wealth of Nations* published in 1776. Scott's analysis of an individuals' rights to natural resources is based on six elements of property rights of which exclusivity, duration, quality of title and transferability are used as a basis for the analysis while flexibility and divisibility are not analyzed any further. Fulfilling these characteristics to a satisfactory extent will create preconditions for the holder of the property right to conduct three fundamental functions with his resource: (1) use and manage the land, (2) transfer it and (3) take income or rent from its use. A standard right is said to be complete or well-defined when a property right enables its holder to carry out the three functions, while in an opposite case the property right is described as 'incomplete' or 'weak' (Scott, 2008, p.5). A well-defined property right is considered to induce an efficient use of the resource. It assures that all the benefits and losses will accrue on the owner and thus creates preconditions for increasing the value of the resource (Alchian, 2008).

The socialist system of ownership is defined by neoclassical theorists as a weakened property right system. In Soviet Union, factors of production were formally owned by all the Soviet citizens collectively, although in reality bureaucrats such as kolkhoz managers exercised power over the resources. This is referred to as a weakened property right system because it permitted or even encouraged a weak economic performance from those who had power over the resources: a socialist manager did not personally gain (lose) from the increase (reduction) in value (Alchian, 2008). The standardized property rights system applied in Soviet Union is not examined any further in this paper because it was not applied on Soviet citizens' household plots. Although all the land was held either by the state or under collective ownership, citizens could still receive a permanent or temporary user right on a piece of land. Permanent user rights were often granted for such purposes as personal garden plots or individual housing

construction. A permanent user right provided the holder the same rights and responsibilities as well-defined property rights granted in the capitalistic societies, except for the right to sell or purchase land. Temporary user rights were similar to land leases in capitalist societies (Ford et al., 1998, p.45-46).

The first characteristic is *quality of title* and refers to the extent to which the property right is secure against others' claims. A strong quality of title is the very foundation for soil conservation and sustainable land management because it ensures that the land owner will reap the benefits from his improvement efforts. Quality of title is closely related to the duration of a property right because a weak quality of title could lead to expropriation or nullification of an owner right and thus shorten the duration. A title is considered to be of high quality if the owner can be confident about maintaining it and his powers against any potential intruders, such as state or private actors. Quality of title has historically been determined by three conditions: (1) legitimacy, usually gained by inheritance, conveyance or custom (2) security from government confiscation of land and (3) enforceability (Scott, 2008, p.8).

Enforceability relies on existence and proper functioning of jurisdiction of social institutions such as courts. Freedom from government seizure of land has in most corners of the world already been achieved. As governments started gradually losing their powers of confiscation, they issued restrictions on compulsory purchase (Scott, 2008, p.8), which is defined as the “power of government to take private property for public use without the owners consent” although the owner is practically always compensated for the loss with a payment (Encyclopedia Britannica). These restrictions are applied in most industrialized countries and respect for private property is strongly associated with wealth, education and economic growth (Scott, 2008, p.8). The relatively rare cases of compulsory purchase of private land with the purpose of making it available for public recreation and wildlife habitat have strongly been opposed by landowners and other members of the society. Imperfect quality of title forces land owners to share their resource with the public (Scott, 2008, p.8).

Transferring legal title over a resource to a property right holder is expected to give the holder an incentive to use the resource productively. However, the state retains its ability to withdrawn property rights in multiple ways by exercising its monopoly on use of coercion. Coercion can be applied through expropriation, renationalization, or modifications in

regulations and tax policy. Land owners who expect the state to change their rights in the future have little incentive to use their resource productively in the long run. If the community views existing property rights as illegitimate, the fear of reversing privatization might be enhanced. The design and implementation of privatization programs affect the subsequent legitimacy of the property. This is a critical issue for transition countries like Georgia where privatization is rarely transparent. According to Frye, privatizers should therefore prioritize privatization procedures that are widely accepted by the community. This might require greater transparency, simplicity and public debate of privatization policies (Frye, 2006, p. 480, 500-502)

The next characteristic of an effective property right is *duration* which can be measured by the length of time the property right gives the holder to use the resource. The primary principle recognized by the most modern versions of common law is that duration of ownership over a piece of land is either permanent or not clearly defined. Duration of leases and licenses is clearly determined: the period of time is specified by law when public land is leased or by an agreement for transaction over a private resource. Duration of a property right over a private resource has rarely been set by courts (Scott, 2008, p.7).

Another characteristic is *exclusivity* which stands for *all* the benefits and costs caused by using the resource accruing solely on the holder of the property right. Exclusivity can for instance protect the land owner from losses and costs arising from such disturbance as sewage carried downstream from an emitting source through land property owned by someone else. This sort of physical interference entails having to share a resource, for instance land, with other owners, often neighbors. Exclusivity aims at reducing or avoiding such interference. Another interpretation of exclusivity is a freedom from government regulations that restrict the use of a resource in order to promote a public good or government's own purposes (Scott, 2008, p.6). The most significant public goods provided by agriculture are environmental services and highly valued by the society. These environmental services include agricultural landscapes, farmland biodiversity, water quality and availability, climate stability achieved through control of greenhouse gas emissions and carbon storage and air quality. Public goods of a social character refer to food security, farm animal welfare and health (Cooper et al., 2009, p.2). Although public goods do provide valuable environmental services, the farmer does not

receive any financial compensation for them and the services are said to create positive externalities. Positive externalities are the benefits produced by the property right holder which do not accrue to only to the land owner: other members of the society can not be excluded from enjoying these services (Tietenberg et al., 2008, pp. 76-79).

An additional aspect of exclusivity, that is not included in Scott's analysis, is protecting the environment surrounding a farm, and thus the society as a whole, from negative effects of agriculture which give rise to so called off-site costs or external costs. Since soil is involved in many of the processes of the complex ecosystem it is natural that the causes and effects of degradation are not limited by the boundaries set up by land ownership. These costs are referred to as social costs since they are born by the society, instead of the landowner (Tietenberg et al., 2008, pp.70-71). State needs to take corrective measures by imposing taxes, fees and regulations on polluters in order to prevent or at least abate off-site damage and restore efficiency of the system. External costs have been used as an argument for disputing the socially optimal outcome that the price mechanism is supposed to ensure (Bromley, Hodge, 1990, p. 198).

Transferability affects the extent to which the property owner may trade, sell or leave his/her share of land or a natural resource to be inherited by the property holder's offsprings. Significance of this characteristic is emphasized particularly in the allocation economics literature because transferability plays such a crucial role in creating markets for property rights: a perfect market requires perfectly mobile property rights. In reality, a complete transferability of land rights is uncommon since its implementation is hindered by customs and laws, such as price controls that often are imposed by the government. Nevertheless, land owner has an almost complete right to transfer land while transfers are usually limited for leased land. User of a resource (for example person renting the land) is generally not allowed to sell the land he or she is renting (Scott, 2008, p.9).

3.3 Private property and environmental protection

Private property rights encourage environmental protection in several ways. First of all, private ownership gives a resource owner an incentive to conserve the resource because it results directly in higher value and thus in increased personal wealth of the owner. If the owner allows the resource to degrade, for instance by pollution, he or she personally bears the negative consequences caused by lowered value of the resource. Soviet farmers did not have the incentive to maintain the value of agricultural land by preventing its deterioration because they did not personally benefit from the higher value of the land (Stroup, Shaw, 1997, p.24). Conservation was not encouraged in the socialist economies because factory and kolkhoz managers were under a constant pressure to increase production at any cost. Money spent on pollution control-equipment was a non-productive expenditure which reduced the amount of money available for capital investments used to increase production. A factory manager received a bonus if he or she succeeded in fulfilling the plan and the bonus would probably have suffered from choosing to divert resources into conservation (Goldman, 1972, p. 67). A second aspect is that private property rights provide the owner with legal rights against anyone who would harm the resource for instance by pollution. A system of correcting the failure or compensating the afflicted parties for the damage through legal process did not exist in Soviet Union (Stroup, Shaw, 1997, p.24) and even in the market economies this has proven difficult to implement. In Bulgaria heavy metals were released in irrigation water which lowered crop yields. Even though the industrial sources of the metals were well-known, farmers could not hinder land pollution. Finally, well-defined property rights encourage maximizing the long-term value of a resource, even for owners who have a more short-sighted approach on the use of resource. A land's current value reflects the *net present value* of its future services. Net present value is determined as the revenue from production or the services from the land, minus the costs of creating the revenues. Both the revenues and costs are discounted to present value terms to allow comparison of benefits and costs arising at different points in time. Time is often a crucial factor because many of the decision made today have long-term consequences. For instance, assigning a piece of land for the construction of a toxic waste dump lowers its future productivity which is reflected by the lowered value today (Stroup, Shaw, 1997, p.24).

3.4 Soil conservation

Soil conservation can simply be defined as protection of soil against erosion and deterioration in order to maintain soil fertility and productivity (OECD). There are several measures that a *farmer* can undertake in order to conserve his or her soil. Since focus of the study lies in the farmers' perspective, the measures discussed here include only those that can be implemented by farmers. Soil conservation methods against salinisation are consequently not dealt with because rehabilitation of irrigational channels requires the state to take action, while an individual farmer has little chance of taking up such an infrastructural project with his or her limited means. The measures discussed should not be considered as an exhaustive list but rather as a set of examples aiming at enlightening the variety of options. The specific measures depend on the location, degree and type of degradation.

Some effects of soil erosion are reversible by a suitable soil conservation program and sustainable farming practices, while severe cases of certain types of erosion are in practice permanent because soil formation is so slow. Soil conservation methods against wind erosion consist of restoration of windbreaks and spraying the soil with stabilizing compounds like oil products and shredded bark (Ballayan, 1993, p.14). There are also several relatively easy methods for reducing water erosion. Such methods include leaving surface residue, using cover crops to reduce the time when soil is left uncovered and contour plowing which means plowing parallel rather than perpendicular to a slope. Shallow, grass-covered ditches that carry off excess water can be dug on the slopes where water usually gathers. The more complicated methods include terracing and strip cropping which simply means growing grass between row crops like beans and corn in order to slow down run-off water before its velocity grows too high. In addition, silt fences can be built around a cropland and construction sites to hinder soil movement off-site (Coyne, Thompson, 2005, p. 270). If the polluting source is a neighbouring farm, cooperation between farmers in some form of joint action can help abate soil degradation. Soil contamination and acidification can be reduced by a correct use of mineral fertilisers and pesticides.

4 Analysis

4.1 Private farming in the Georgian Soviet Socialist Republic

Private agriculture in Soviet Union took a few different forms such as personal subsidiary plots of collective farm members and other rural residents, garden plots of city dwellers, and subsidiary plots of enterprises, organizations and institutions (Rumer, 1981, p.562). All the respondents reported having farmed a household plot and in a few cases a so called kolkhoz land plot. A description of these two forms of Soviet private farming will provide material for an analysis of permanent user rights in the following section.

Household plots allotted to rural population were generally small, only 0,25 hectares each (Rumer, 1981, p.560). Plot sizes reported by the interviewees were slightly larger and varied from 0,25 to one hectare. According to all the respondents, farmers made all the decisions concerning the land use by themselves, without any interference from state officials. Most of the harvest was consumed by the household, while the share that exceeded the household's needs was either sold in the market or to a kolkhoz. The only obligation towards the state was paying an annual property tax on the land (Eliso, Murman). All the fourteen respondents were unanimous in that there was no risk of state expropriating their personal subsidiary plots as long as the farmer limited his private farming activities to the assigned land.

“I could decide by myself what I wanted to grow on my small household plot. No one had anything to say about that. If the household didn't need all the harvest for themselves the rest was just sold in the market. [] The state never took away the land after it was given to people for farming but we were only allowed to cultivate the household plot assigned to us and no more.” (Jura)

Land users were able to rent machinery and buy fertilizers to a very reasonable price directly from a kolkhoz (Zauri, Koka, Murman, Jura, Nugzari). Other forms of assistance received free of charge by private farmers were soil analysis and consultation on appropriate land management methods from agronomists:

“Soil analysis was carried out during the Soviet times. Specialists came from Anaseuli [All-Union Research Institute of Tea and Subtropical Crops, my remark] to collect soil samples and in one week we got the results back. It said what kind of different minerals and nutrients the soil needed. Then they wrote a land management plan.” (Valerian)

The permanent user right on a piece of land remained in ownership of a family through inheritance from one generation to another which all the respondents had personally experienced.

Another form of private farming reported by the interviewees is the so called “kolkhoz land plots” as referred to by the respondents. Four interviewees (Murman, Valerian, Eka, Eliso) said having farmed kolkhoz land plots in addition to the personal household plots. All of them or their spouses had held a position at a kolkhoz for instance as a technician and an accountant. Kolkhoz land plots were assigned to the most merited and loyal kolkhoz members (Rumer, 1981, p.562, Koka) or to the members who had a large family to support:

“In 1973 we got six hectares from a kolkhoz to cultivate because we had three sons. This was kolkhoz land.” (Eka)

Allocation was based on the number of members in a kolkhoz worker's household and the initial allocation was adjusted according to the changes in the size of the household. If a son got married and the household grew larger as a newlywed spouse moved in, the kolkhoz member received more land (Pridon). Kolkhoz land plots were generally larger than household plots, as the quotation above reveals. Kolkhoz land had thus a clear function of providing food stuff for rural population. A user right on kolkhoz land plots was accompanied by certain limitations that were not applied on household plots. The kolkhoz worker received orders from the kolkhoz manager on which crop would be sown on the land. The kolkhoz member got a free access to kolkhoz owned inputs such as fertilizers, seedlings and machinery. The favor was returned by handing half of the harvest over to the kolkhoz without receiving any compensation.

“I got an additional hectare of land from the kolhoz because I worked there. I couldn't decide by myself what to plant on the land but I got fertilizers for free and gave half of the harvest back to the kolkhoz.” (Murman)

The other half the farmer could consume by himself or sell at a market (Eka).

4.2 Permanent user rights of personal household plots in Georgian Soviet Socialist Republic

Although the Soviet system of permanent user rights (see the Word list for a definition of the term) have certain similarities with the private property rights system of capitalist societies, several elements described by Scott are not fulfilled. A brief analysis of the permanent user rights system that characterized the Soviet private agriculture will follow in order to provide a more profound understanding of the incentives for soil conservation the way that the respondents experienced them in the Soviet times. The following analysis does not strive for the same level of details and accuracy as the analysis on the existing property rights system. The reason is that the Soviet system of ownership ceased to exist twenty years ago and respondents' recollections can not be expected to be very accurate.

As accounted for in a previous chapter, there was no possibility to sell or purchase agricultural land that a Soviet citizen had received a permanent user right for. This violates the transferability element of a private property rights system. However, lack of transferability can serve as an incentive for soil conservation. When there is no possibility of purchasing more land, farmers are encouraged to apply sustainable farming methods on their existing land. Another important incentive for maximizing productivity of land is the fact that farmers could raise income from their land by selling the agricultural production that exceeded needs of their household at local markets. Nevertheless, abundance of cheap inputs imposes a risk that productivity is increased by intensifying use of inputs, rather than by investing in soil conservation. Information services that were established in order to support private farming on the other hand suggest that farmers were informed of the adverse environmental effects farming practices and thus avoided over-fertilizing the land assigned to them.

What concerns the quality of title, the kolkhoz land plots were not secure from government confiscation since size of the plot was adjusted according to the changes in number of household members. The household plots on the contrary were not in any danger of confiscation. Permanent user rights were passed on from one generation to another by inheritance so that duration of a user right was indefinite, or undetermined. Passing household plots to offsprings through inheritance creates yet another incentive for soil conservation.

In section 3.3 *Private property and environmental protection* it was stated that exclusivity characteristic was absent in Soviet Union. Nevertheless, it should be born in mind that since the end of 1970s the Soviet government did put great effort in supporting private farming (Rumer, 1981, pp. 562-563) and could be expected to take action in case private household land was polluted by a production facility. The worsening food shortage gave an incentive for the government officials to make a thorough cost benefit analysis of the situation to determine if pollution control created a greater social benefit. Goldman points out that since all the economic and political power was concentrated in the hands of the Soviet state, it also had the potential for being the most effective tool for conservationists. Although this power was all too often utilized for striving for economic growth and industrialization, some positive examples are also evident, such as creation of natural preserves (Goldman, 1972, p.273).

4.3 Privatization of agricultural land in Georgia 1992-2010

After gaining independence in 1991, an unofficial land privatization took place in Georgia when households simply took over land that was previously owned by kolkhozes and sovkhoses. In 1992, privatization of agricultural land, referred to as the passport system privatization, was launched and practically everyone had a right to receive land (Thomas, 2006, p.235). Such a privatization strategy was aimed at avoiding mass starvation in 1992-1994, a period of time characterised by criminality, economic crisis and a drastic drop in agricultural production (Felloni, 2007, s.23). In the lowlands, privatization was carried out on basis of three categories: (1) existing farmers managing their household plots or kolkhoz land they had taken over without a permission were entitled to up to 1.25 hectares of agricultural land per household (2) other rural households up to 0.75 hectares, and (3) urban dwellers up to 0.25 hectares. Parcels of land distributed in the highlands were somewhat larger: a household of the first category had a right to a maximum amount of 5 hectares of agricultural land (Felloni, 2007, s.2). In regions where the land available close to the village was limited by nearby mountain and thus insufficient to cover demand, households received less than the required 1.25 hectares (Thomas, 2006, p.235).

The second phase of land reform programme was launched in July 2005 when a new law on

privatization of state-owned agricultural land was passed. The law allowed privatization of additional 360 000 hectares of state-owned agricultural land in somewhat larger parcels of minimum three hectares. Aim of such privatization was to overcome the major obstacles created by fragmentation of agricultural land created by the first phase of privatization (Thomas, 2006, p. 234-235, Davis et al., 2008, p.10). According to Shatberashvili, representative of a juridical department of a local non-governmental organisation *Elkana*, the law was partly intended to restore the value of agricultural land that had remained very low. Value of land is recognised by neoclassical economists as an important source in providing soil conservation incentives for farmers and is discussed in greater detail in section 3.3 *Private property and environmental protection*. There were two approaches. First, farmers who were leasing land got the opportunity to purchase it for a reduced price. If a farmer had no intention of buying the leased land it was put on open auction. The other land privatization strategy was aimed at selling larger land parcels of minimum 40 000 hectares. Shatberashvili estimates that neither of the measures gave the desired results although the Georgian government has not released any statistics that could confirm her observations (Shatberashvili, 2010).

The third phase of privatization was commenced in July 2010 by passing another law on privatization of agricultural land. The law modified some of the unfavorable terms that previously had hindered rural residents from purchasing the land they were leasing. By adopting this law the right to purchase land for a reduced price provided in the second phase of the privatization was withdrawn (Shatberashvili, 2010). There is understandably no statistical data yet available on the proceeding of the third phase of privatization.

Due to lack of statistics on the land privatized during the second and third phases of privatization, description on the current state of Georgian agriculture is based on the results from the first stage. During the first phase of privatization, 25 percent of the total agricultural land was privatised, while 31 percent was leased. The chosen allocation strategy resulted in that 1 055 200 Georgian households, corresponding to roughly four million citizens, became land owners of 0.9 hectares of agricultural land in average (Thomas, 2006, p.234-235). In addition to the smallholders, the first phase resulted in formation of a second group of land owners that consisted of roughly 32 000 farmers who owned about 10 hectares of agricultural land. A third group of farmers included approximately 6300 commercial farms with an average size of 90 hectares usually registered as cooperatives (Thomas, 2006, p. 235). Agriculture in

Georgia is thus predominantly practiced by small-holders and in many cases as means of survival, which may have implications on farmers' soil conservation incentives and will be discussed in section 4.7 *Farmers' motivation for farming*. Another important result of the first phase of privatization is that a huge number of individuals became private land owners. The effects of this factor on farmers' soil conservation incentives will be scrutinised in section 4.6.1 *Quality of title*. However, a large number of tiny land plots has also contributed to fragmentation of agricultural land which has given rise to numerous problems, such as becoming a constraint to raising rural productivity and developing a functioning land market (Davis et al., 2008, p.10).

4.4 Respondents' knowledge of soil degradation

Respondents' level of knowledge of soil conservation and degradation can have an impact on the conservation measures that they choose to take on. A situation where a farmer has necessary conservation incentives might be hindered from taking action by insufficient information on the various measures. A question "What kind of changes in soil quality have you observed on your own land and what is the cause of those changes?" was asked in order to investigate the matter further. The extent of changes in quality of soil was not particularly important for the study and the first part of the question was aimed at clarifying the concept soil degradation through a farmer's own observations. I intentionally avoided using terms *soil degradation* and *soil conservation* in the question in the fear that respondents would not be familiar with the terms. A majority of respondents had observed worsening soil quality during the past years. One interviewee had witnessed considerable improvement in soil quality (Pridon) and another no significant change (Nugzari) thanks to the drastic soil conservation measures they had undertaken. Both of these farmers were thus aware of the effect of soil conservation measures on soil quality.

Answers on the causes of soil degradation reveal respondents' lack of knowledge on the matter. Only a few respondents (Nugzari, Lia, Eka, Zauri) were able to make a causal connection between farming the land without putting enough effort on restoring nutrition balance and the resulting nutrition depletion.

“The soil quality will worsen if you work hard on the soil and don't give it fertilizers.” (Nugzari)

Quite a few respondents (Jura, Pridon, Nana) were not able or willing to elaborate on the causes of declining soil quality and simply stated the tangible on-site effect, reduced yields:

“The farmer needs to work harder on his land because the soil becomes worse and worse all the time and the harvests decrease every year.” (Nana)

In a similar fashion, Zauri and Valerian were able to recognise specific indications of worsening soil quality on their land although neither of them explained the process. Declining soil quality allowed Valerian's land to be infected by a fungus and a disease referred to as “the cancer”. Zauri gave an accurate account of soil acidification which he had avoided on his soil by building drainage.

However, some respondents (Eliso, Gogi, Gulisa, Ia) were not able to describe changes in soil quality without receiving a following additional lead: “Have the size of your crops been reduced and why in that case?”. The lead did help clarifying the concept of soil degradation. Disadvantage with such a question formulation is that the answer was not narrowed down to the possible effects of soil degradation since several factors influence the size of harvest. Consequently, these respondents stated that the climate change had made its presence known the last years as exceptionally heavy rains and unusually long periods of heat which had taken their toll on the crops. These four respondents replied that climate change was partly responsible for the declining crop sizes they had observed. An overall decrease in soil quality was viewed as a significant co-contributor although they were not able to describe the exact process.

“Harvests have been diminishing the past ten years because of the changing weather and soil becomes worse by the year. There have been long periods of sun and heavy rains lately. Corn needs rain to develop its fruit and last summer we didn't have any rain for a whole month so the harvest was really small.” (Eliso)

Results from the interviews reveal that respondents are generally not well endowed with information on the actual process of soil degradation although all the respondents were able to give some sort of an answer. This is not a very surprising result taken into consideration that soil degradation is expressed through complicated physical, biological and chemical processes but could nevertheless create an obstacle for undertaking efficient conservation measures. An noteworthy observation is that the few respondents who were better informed of the causes all

pointed out the combined effect of intensive cultivation of land and not adding nutrients. This raises suspicion that these respondents might primarily rely on fertilisers as a soil conservation measure.

In addition to the causes of soil degradation observed on farmers' private plots, the respondents identified and correctly explained other types of soil deterioration: water erosion as a result of illegal logging and heavy rain fall in mountain areas (Valerian, Nugzari, Nana), and soil compaction caused by conventional plough tillage (Eka, Nugzari, Valerian). These descriptions indicate that a few respondent were aware of soil degradation as a larger phenomenon and of the risk that unsustainable farming methods impose on well-being of soil.

4.5 Measures for improving soil quality

Farmers report taking several different measures in order to improve or maintain quality of their soil. The different methods include applying mineral fertilisers and organic fertilisers (manure, soil saturated with salts, dead leaves), tillage by a tractor, correct way of irrigating crops and letting the land lie fallow. The so called new soil is collected from the banks of mountain rivers and therefore it is very fertile and an effective fertiliser, according to the respondents. This is confirmed by Goldman (1972, p.167): rain water and mud are enriched with mineral salts of the soil when they flow down the mountains before forming rivers. Mineral fertilisers and ploughing the land with a tractor can have both detrimental and positive effects on soil fertility depending on in the way they are used. Tractor was reported being used as a soil conservation measure by only one interviewee and other respondents were generally quite well aware of its potentially adverse impact on soil quality. Mineral fertilisers will be discussed further in the section 4.6.3 *Exclusivity*.

Except for one respondent's intention to implement strip cropping in the future (Pridon), none of the methods listed above are mentioned in section 3.4 *Soil conservation*. Although the theoretical discussion on various conservation methods was by no means exhaustive, the results do raise suspicion that respondents might lack information concerning the variety of conservation methods. However, one must bear in mind that in sections 1.1. *Background and problem definition* and 3.4 *Soil conservation* causes of soil degradation and conservation

measures are outlined for the entire country. Climate, nature and consequently even the sources of soil degradation vary greatly between different regions of Georgia; wind erosion causes damage in Eastern Georgia where climate is comparatively dry while water erosion is commonly observed in the subtropical Western Georgia. Therefore, only some of the types of soil degradation mentioned in section 1.1 torment the Samegrelo region. Unfortunately, not even my visit to the the Scientific-research institute of tea and subtropical cultures of Anaseuli was able to provide me with necessary and up-to-date information on types of soil degradation in Samegrelo region simply because there is no such information available, according to the local experts. An interesting observation is that although several respondents were not able to explain the exact process of soil degradation, all of them reported applying some of the measures listed above with the specific aim of improving or restoring soil quality.

4.6 Respondents' perception of the current private property rights

The four components of a complete private property right are applied on results from qualitative interviews in order to investigate the respondents' view on their current property rights: whether the owner rights are considered as complete or defective and the impact on soil conservation incentives.

4.6.1. Quality of title

Legitimacy

Since legitimacy of property rights is influenced by the manner in which the property was obtained, a discussion on the various privatization practices applied on respondents' land property follows. All the respondents, except for one, acquired private property rights over the land parcels they farmed in the Soviet times although a few have not obtained a document of ownership over their land parcels. All the respondents had inherited land from their parents already during the Soviet era and all of them, except for the one who lost his land in the turmoils of the civil war, acquired private ownership for the land through various privatization

procedures. Half of those respondents received also some additional land during privatization. The respondent whose Soviet household plots was not privatized, used to reside in the autonomous republic of Abkhazia within the Georgian Soviet Socialist Republic. In 1992 he was forced to flee Abkhazia when the military conflict broke out and since then has lived in Samegrelo region as an internally displaced person, IDP.

In addition to receiving ownership over the Soviet household plots which was a routine procedure applied on all the rural households, respondents witnessed three additional ways of acquiring land ownership during the first phase of privatization. These consist of: (1) acquiring ownership over the so called kolkhoz land assigned for personal use of the most loyal kolkhoz members (see section 4.1 *Private farming in the Georgian Soviet Socialist Republic* for a definition of a so called kolkhoz land), (2) acquiring ownership, or a user rights in case of long-term leasing, over state-owned land previously managed by kolkhozes and sovkhoses either by leasing, buying or simply applying for private ownership, and (3) taking over state-owned and managed land without a permission and later obtaining a document of ownership.

The first type of acquiring ownership over an additional piece of land besides household plots was reported by two respondents (Eka, Valerian). Eka's household received a private property right over the six hectares of the so called kolkhoz land that her family had farmed during the Soviet regime since 1973 (Eka). In 1992 they send a request to state officials applying for the property right over this land which was consequently granted (Eka).

“We just sent in an application for the privatization of the piece of land and got it too. We even have a document to prove it.”

Curiously enough, not all the respondents who had farmed kolkhoz land in the Soviet times received property right on the land during privatization. One such respondents who consequently was forced to buy land during the second phase of privatization expressed an interesting view on the privatization. His reply on the question “Did you receive some land during privatization of agricultural land previously owned by the state (kolkhozi, sovkhozi)?” goes as follows:

“Nobody got any land for free. Why would people buy land now if there had been a possibility to get it for free?” (Murman)

His comment suggests that the rural population was to some extent not informed about the

possibility to receive land.

The second way of acquiring additional land during the first phase of privatization by applying for a property right over a land parcel is described in the following quotation:

“My family got 0.6 hectares of agricultural land from the president in 1992. We bought a bit more after that because our son got married and we needed more land to support everyone.” (Jura)

The conveyance was indeed signed by the president Shevarnadze so that for a citizen it might have seemed as if the president himself was allocating land. In addition to the land he got free of charge, during the first phase he also bought a small piece of land. Another way of acquiring a property right over state-owned land by lease is reported by Pridon:

“During privatization I first leased fifteen hectares of land for ten years. When the new law encouraging buying the land under lease was passed, I bought it.” (Pridon)

The third privatization method was reported by two respondents (Gulisa, Lia) :

“I didn’t get any land for free during privatization so I took some by myself. Many people took land without asking for a permission if there was some available land behind their household plots. Later I got a document for ownership for that land.” (Gulisa)

Other respondents acquired land during the second phase of privatization. Murman and Enguri bought land in 2005:

“Six years ago we bought two hectares of land that is connected to the household plot we inherited from parents. Later on we bought seven hectares more to a very low price from relatives. This piece of land is situated two kilometers away.” (Enguri)

The quotation above confirms the widely documented consequence of privatization, fragmentation of agricultural land. Most of the respondents own two pieces of land which are located apart from each other.

It is interesting to notify how many of the respondents got the amount of land they were entitled to during privatization which might have an impact on farmers’ perception of legitimacy of privatization process. All the respondents belonged to the first category since they had farmed a household plot in the Soviet times and were thus entitled to up to 1,25 hectares of agricultural land per household. All of them, excluding Nugzari, received 0,3-7 hectares of land free of charge during the two phases of privatization of agricultural land. A vast majority acquired ownership for approximately one hectare of land which is very close to the 1,25 hectares assigned to each rural household. A majority of respondents confirmed that

there is hardly any land available in the vicinity of their villages, which could explain why the quota of 1,25 hectares per household was not fulfilled. Most of farmers were satisfied with the amount of land they owned. Ia, Jura, Murman, Eliso and Zauri wished to purchase more land but factors such as lack of money and extra labour during harvest period, and shortage of free land close to the village did not permit them to increase the size of their land. Eliso expressed an understandable concern that the 0,5 hectares she owned was not enough to support her household, while the others were eager to expand in order to develop their farming businesses:

“I would like to buy more land because what I own now is not enough to feed my family. But I don’t have money to buy any more.” (Eliso)

Since a large majority of respondents received a considerable amount of land during privatization they do not have an obvious reason for being discontent with the process. The chosen privatization policy is likely to be accepted by the community since it turned four million Georgians into private land owners (Thomas, 2006, p.234-235). Furthermore, this creates legitimacy for property rights. Even if some got more than others, the average amount of land received by a rural household was around one hectare. The respondents who received additional land free of charge had farmed it as kolkhoz land. This previous connection to the land could make transfers of larger parcels more acceptable. None of the respondents protested the fact that allocation of land was not entirely equal among all the households.

Respondents’ sense of security what concerns their property rights might be connected to the fact that all of them, excluding two, had a document verifying their ownership over land. One of those two respondents who lacked such a document had acquired land by taking over state-owned land by herself and commented the current situation as follows:

“Not having a document of ownership is risky business in case somebody comes and asks. I can neither sell my land nor use it as a collateral for taking a loan.” (Lia)

The reason for not acquiring the document is the high price, 300-500 GEL. The household was currently trying to save money in order to obtain the document.

Expropriation and enforceability

My conclusion is that the privatization policy implemented in Georgia was very effective in eliminating any skepticism that community might have for legitimacy of private property rights on land. The logical consequence is that farmers should not fear any government

expropriation which is largely supported by the interviews: all respondents with one exception agreed that there is no risk that the government might expropriate their privately owned land at the current moment. Interviewees' unanimity, with one exception, presupposes that they must have confidence in the state institutions for protecting them against any such claims, which was confirmed by one respondent. Jura stated that the risk of expropriation will be eliminated by applying correct procedures when drafting land ownership documents:

“State can't take away land if documents are done correctly.” (Jura)

Another respondent, who besides his farm, runs a local food production company, announced that he personally runs no risk of government expropriation because he has very good relations with the current government (Pridon):

“There is absolutely no risk that the government would touch my property because I have very good contacts with the government. I have participated in many business seminars and got the chance to personally meet several ministers and the president Saakashvili himself.” (Pridon)

Although his comment could easily be interpreted in the way that small-scale farmers who lack any personal contact with the government could face a risk of expropriation, a vast majority rejected such a scenario.

The only sceptic, Zauri, had quite the opposite opinion on the matter. He would like to purchase more land, in addition to the two hectares he currently owns, but does not dare because there is currently no law regulating private ownership of land.

“I'd like to buy more land for growing nuts but I don't have enough money at the moment. Besides I'm afraid buying land since there is no law on land ownership. It simply hasn't been legislated. There's so much free land too but for some reason the state isn't selling it at the moment. I would never dare buy land from a neighbor either because it's riskier. A neighbor can't give a document of ownership.” (Zauri)

According to his view, the lawlessness has given rise to a risk that the state might expropriate recently purchased land, implying that application of property rights depended on when the land was bought. However, his view should not be expected to decrease his incentives for soil conservation since the lack of property rights concerned only recently bought land, while he acquired his land already during the first phase of privatization. His suspiciousness can arise either from lack of information on the enforced property rights or from lack of trust for the institutions that are actually in charge of enforcing the property laws. However, it is impossible to know this for certain. When the respondent was confronted with how exactly he had developed such a divergent view on the property rights legislation he was not able to

provide a clear answer.

Three respondents did not feel as confident about the enforceability of property rights what concerns the future (Lia, Valerian, Murman). To the question “Is there a risk that the state can expropriate your land?” one of the skeptics answered:

“No, not now, but I feel uncertain about the future.” (Lia)

However, most of them failed to elaborate on what their suspicion was based on. Their suspicion could of course be a cause of a more wide-spread insecurity in a society characterized by constant reforms. Only one of the skeptics was able to give a concrete explanation for his concern (Murman). According to him there was a risk that the legislators might pass a law raising the property tax on even the smaller parcels of agricultural land which would force many of the small-scale farmers out of business. Changing tax policy is one potential way of reversing privatization mentioned by Frye (2006, p. 480). To the question concerning the possibility of state expropriating privately owned agricultural land he answered as follows:

“No, but you can never be certain about the future. Maybe there will be a new law on land taxes and then people who can’t pay the tax will have to sell their land.” (Murman)

From all the respondents, Murman’s household had the most limited financial means and his livelihood is thus best described as subsistence farming. Imposing a property tax on land would create a very real threat on the existence of his farm and consequently on the livelihood of his entire family. On the whole, some respondents’ insecurity for development of property rights in the future can have an impact on these respondents’ incentives for soil conservation. A farmer who fears his or her land to be redrawn in the future in one way or the other has reduced incentives to invest in their resource. This might have affected Lia’s incentives for soil conservation. She described her future ambitions as follows:

“If I had more money I would invest it in buying more bee families and a few sheep.”

I (the interviewer): How did you become interested in bees in the first place?

“All the neighbors in the village grew all the other crops so I wanted to invest in something else like honey and hoped that it would be easier to sell. But since the Russian border was closed in 2005 it has been really difficult to sell honey. In the future I’m hoping to open small honey shops in villages around here and maybe sell to exporting companies like the ones that export nuts. I make more money for honey than nuts anyway, but why does it have to be so difficult to sell the honey?” (Lia)

Although there is no sign of Russian export markets opening in the near future, Lia nevertheless estimates that the situation as a whole is more beneficial for producing honey, instead of growing crops. Her cost-benefit analysis could well be influenced by insecurity of property rights since prospects for honey markets look very grim. On the contrary, the two other respondents' skepticism towards future development of property rights does not seem to have an impact on their soil conservation incentives: both of them reported a great deal of conservation effort, which could also be a result of both of their previous work experience in the agricultural sector.

4.6.2 Duration

Duration can be measured by the length of time the property right gives the holder to use the resource. While duration of leases is clearly defined, the duration of ownership over a piece of land is usually permanent. This was confirmed by the respondents as they unanimously answered that there is not risk of their private property rights could be withdrawn any external actor, at least at the present moment.

4.6.3 Exclusivity

According to the exclusivity characteristics all the costs and benefits of using a natural resource should accrue only to the holder of the property right. One aspect of exclusivity is freedom from government regulations that restrict the use of a resource in order to promote a public good such as agricultural landscapes and farmland biodiversity. Even if promotion of public good is generally conceived as a valid reason for restricting land use, the limitations would nevertheless impose a threat on the property holder's exclusive right to decide how the resource is being used. According to the National Environmental Action Plan for 2011-2015, that sets a national agenda for cost-effective improvement of natural resources and the environment (MEPNR, 2010, p. 2), the government has so far not taken any action for protecting the environment which might require restrictions on private land use. However, the National Biodiversity Strategy and Action Plan approved in 2005 describes one project that

implies a threat for restricting private property rights: turning farm land into protected areas, where utilization of natural resources (land) is prohibited by law (Chape et al. 2008). A ban on land use would restrict farmers' activities to only providing the public good which he or she does not receive any compensation for. A threat that government might impose restrictions on land use in the future, might reduce property owners' incentives for using their resources productively. A profit-maximizing, rational homo economicus would not make the conservation investment that maximize productivity of land in the long run if his or her user right to farm the land is restricted. In Georgia establishing protected areas is already under way. The project has been carried out in several regions and the government is aiming at increasing the number of protected areas from 7,1 percent of total land area in 2010 to 15 percent. Georgia, as part of the Caucasus region, represents one of the thirty-four biodiversity hotspots in the world identified by Conservation International, a non-profit organization devoted to species conservation, so there is an obvious need for protection of biodiversity. However, Samegrelo has so far been spared from such plans. Since none of the on-going projects are directed to territories located in Samegrelo region (MEPNR, 2010, p.42-47) turning private land to protected areas is not a current threat for the respondents. An interesting result of the interviews is that respondents unanimously rejected the scenario that state officials would restrict or interfere in their land management decisions in any way:

“The state officials don't have a say in the way I farm my land.” (Eka)

Another point of view to this aspect of exclusivity is the one presented by Frye who actually identifies government regulation as one way of reversing privatization. Since creation of protected land areas are characterized by land use restrictions that effectively hinder farming, it could be well considered as withdrawing a property right on a piece of land.

The second aspect of exclusivity, according to which complete property rights should protect the land owner from other land owners' intrusions, for instance from sewage emitted by a production facility, is not relevant for my study. The reason is that there are hardly any production facilities working in Samegrelo region. The major industrial cities Zugdidi, Senaki and Poti contribute to 80 percent of all production in the region although the total industrial production is very modest (REC). This statistical fact is supported by my observations. A consequence of such low economic activity is that there are hardly any emitting resources in the region and the existing ones are primarily situated in the cities named above. However, none of the respondents' farms were located in any of those cities. Agriculture is thus the most

important sector in the region (REC) and consequently the most real threat of pollution emission is created by the farms. Respondents' low awareness on the potentially adverse effects of agriculture suggests that even if emission of mineral fertilisers in waterways actually occurred the farmers would never know the difference. The only real threat of another land owner intruding on someone else's land is created by animal husbandry which was practiced in small-scale by most of the respondents. However, the risk is minimal because cattle and pigs are free to graze on abundant communal land. The second aspect of exclusivity is thus not analyzed any further in the paper.

Complete property rights should at least in theory protect the society from a lot of the harm that farming might cause on the surrounding environment in their absence although it is difficult to abolish negative externalities altogether. However, there are two major obstacles that hinder private property rights from functioning efficiently. First of all, the state institutions that are supposed to set reasonable boundaries for private actors are currently absent in Georgia. Secondly, results from the interviews suggest that farmers are not aware of the detrimental effects of their farming activities. These two facts can have a powerful impact on rise of external costs from farming activities. In the *National Report on the Implementation of the UN Convention to Combat Desertification* it is bluntly stated that the state has not succeeded in creating efficient monitoring and managing mechanisms for the small-scale private farms that appeared as a result of privatization of agricultural land (MEPNR, 2006, p. 11):

“Currently, there are no such market mechanisms which would regulate the relationships between the state and small-scale private farms. It is almost impossible to control their activities, including the activities that result in land degradation/desertification.”

The situation is aggravated by institutional challenges that so far have not been overcome. The rights and obligations are spread among numerous weak and under-funded local and central authorities which have not succeeded in developing strategies for the functions that fall under their jurisdiction. The underlying problem is that the government has not yet developed a state policy on measures dealing with land degradation which is essential in guiding the operations of other authorities (MEPNR, 2006, p.12, MEPNR, 2010, p.64). Respondents confirmed that they were not aware of any environmental laws and regulations.

There is reason to be concerned of the off-site effects of agriculture. One well-documented off-site effect of excessive use of fertilizers and intensive animal production is pollution of rivers, lakes and groundwater (Dumanski et al., 1993, ch. 5). According to the National Environmental Action Plan of Georgia for 2011-2015, excessively high levels of ammonia and biochemical oxygen demand (a determinant of organic pollution of water) have been measured in most of the rivers included in the study. Besides untreated municipal waste, that is mentioned as the largest contributor for surface water pollution (67%), another significant source of pollution is agriculture (MEPNR, 2010, p.15). Therefore it is important to investigate respondents' awareness of possible off-site effects caused by farming. For that purpose, the question "What are the consequences of applying mineral fertilizers in excess?" was asked. Due to inherent capacities, organic fertilizers impose an almost nonexistent risk for soil pollution and therefore the question was directed solely on the use of non-organic, i.e. mineral, fertilizers. First of all, applying mineral fertilisers is considered as a fundamentally necessary procedure for restoring soil fertility by a vast majority of farmers. Another clearly dominating opinion (Eka, Gogi, Ia, Nana, Nugsari, Zauri, Lia) was that only effect of overuse of mineral fertilisers is that that residues are left in the plant and that these residues are dangerous for human health when the plant is consumed, without any reference to effects on the soil. However, a few of respondents who concurred with the previous statement added that there will not be any long-term negative effect on the soil because it is able to consume all of the mineral fertilizer, despite the amount of dosage, in the course of a year (Jura, Murman, Pridon):

"If too much mineral fertilizers are used the plant will die and that year the soil quality will worsen so the harvest will be bad. In the long run soil can use up all the fertilizers." (Jura)

Only two farmers suspected that overuse of mineral fertilisers might have a detrimental effect on the soil although none of them was able to specify in what ways the soil would be affected (Valerian, Enguri).

"If too much mineral fertilisers are applied without correct information on their usage the soil can be affected negatively." (Valerian)

An additional question was asked in order to help farmers make a connection between misuse of mineral fertilisers and water pollution. The fact that an additional question was necessary implies that off-site effects of farming activities is not a widely discussed social dilemma. The question was "How do fertilisers affect groundwater and the rivers and lakes located nearby?".

The most popular answer was simply that the water would be polluted and that fish and plants living in them would die, without any specification on how chemicals would actually end up in the waterways:

“Fish in a nearby river died possible because mineral fertilizers ended up in the river.”(Lia)

A few respondents added that their farming activities are not in the risk zone of polluting waterways because they either use mineral fertilisers moderately or their farm lands are situated in a safe distance from any rivers and lakes. However, one respondent was aware of the causal connection between overuse of mineral fertilisers and water pollution of a river (Pridon):

“When it rains the river grows and its surface can rise too close to the plantations so that the water becomes contaminated by fertilisers in the soil. Excessive fertilisers can also be washed out to a nearby river.” (Pridon)

One interviewee answered that mineral fertilisers would not damage water quality because water can purify itself with the help of a stream (Enguri). Similar answers were received for the detrimental effects of pesticides on soil quality and waterways. However, the level of knowledge on effects of pesticides was even lower than for fertilisers. Since a more detailed analysis on pesticides would be very similar to the discussion on mineral fertilizers I believe it would not add any further insights into the study.

The result that only two respondents were vaguely aware of the detrimental effects of overusing mineral fertilisers and one more interviewee knew of the risk of polluting waterways is a very troubling finding. Nana confirmed that she does not have access to necessary information:

“Sometimes I feel like I lack necessary information. For example it’s difficult to decide how much fertilisers to use when the soil quality worsens gradually.” (Nana)

One contributing factor to the lack on information on the environmental effects of agriculture is undoubtedly farmers’ total deprivation of knowledge of private farming accumulated during centuries. This is an effect of dismantling the Soviet agriculture. Since centralised agronomy consulting services provided by the state disappeared and have not been replaced, farmers are left to cope on their own. Farmers turn to each other for advise as unanimously confirmed by the respondents. This has led to a vast mistreatment of land (Beruchashvili, 2002, p.76).

4.6.4 Transferability

An over-whelming majority of farmers said that they could purchase, sell and will land as they wished without any restrictions, as demonstrated by:

“There are no limitations to how much or in what way I’m allowed to buy, sell land or pass on as heritage. I don’t think that anyone would meddle if I decided buy or sell although currently I have no such plans.” (Enguri)

Lia, one of the two respondents that lacked a document of ownership for their land parcels, identified this as a hinder for selling her land. Zauri expressed a concern that government policy on land transactions in the future might change:

“I have the right to sell and buy and use my land in any way I want now, but things might become different in the future if laws are changed.” (Zauri)

An interesting point of view on what is considered as state interference in land transactions was stated by Jura:

“The one way that the state interferes is by demanding that the seller and buyer must gather all the necessary documents. Otherwise I can’t think of any interfering.” (Jura)

The choice of word “interferes” indicates that Jura questions the government requirement of compiling necessary documents for carrying out land transactions. Jura’s statement can arise from the lack of knowledge that documents on land transfer are generally accepted as a requirement for enforcing private property rights in all capitalist economies. However, the aspect of transferability relevant for this study is if respondents consider that their private property rights allow them carry the desired land transactions. All the respondents agree unanimously in that this is the case. According to the theory, this should encourage them to increase the value of land, partly by implementing soil conservation measures.

The fact that transferability characteristic is, in respondents’ opinion, fulfilled it should contribute to the creation of a market for property rights over land. However, there are other factors that must be taken into consideration in determining the incentives for soil conservation provided by transferability characteristic. One factor is lack of monetary income which can create an obstacle for some respondents in drafting the necessary documents. According to my estimation, this fact could hinder four respondents for making any land transactions at least at the current moment. This was confirmed by Eliso and Murman who specifically said that lack of money was the reason they were not able to purchase more land .

These two respondents, together with Gulisa and Gogi, are most accurately described as subsistence farmers since a large share of their agricultural production (80-100 percent) is consumed by the household, in contrast to the commercial farms that sell a much larger share. Their total monthly monetary incomes consist of pensions and the little income from selling the small share of agricultural output not consumed by the household. This is confirmed by a study on former Soviet countries in which Thomas concludes that existence of high notary and registration fees creates a hinder for a majority of small holders for making land transactions because they live below the poverty line. If transactions take place at all, these farmers tend to rely on unofficial verbal agreements with relatives, friends and neighbors (Thomas, 2006, p.241-242). According to respondents another important reason for not purchasing more land is the lack of available land in vicinity of their villages. These four respondents are generally not in position to sell their land either since they are dependent on their farm output in supporting the family. Consequently they have very little use for land transactions.

4.7 Farmers' motivation for farming

The initial privatization strategy of turning over a million private household plots into private property led to the situation where many rural residents became private land owners practically over night. In the Soviet era, a vast majority of respondents were not directly involved with agriculture, i.e. did not hold a position as an agronom or a field worker, and after Georgia gained independence, were forced into farming as means of survival. Twenty years after independence, a wide-spread unemployment in the rural areas persists and some respondents might not choose farming if there were jobs available in other sectors of economy. This can have an impact on respondents' incentives for soil conservation. If farming is perceived as a temporary means of survival, farmers would be less inclined to make long-term investments on soil conservation. However, results from the interviews do not support the hypothesis. Two respondents currently hold a job in another sector of economy and salaries from those off-farm jobs form the primary source of income of their households. Only two interviewees (Zauri, Lia) reported that they would prefer an off-farm job, while half of the respondents said they would continue farming anyway. To the question "If there were jobs available in the other sectors of economy would you still like to work at the farm?" one

respondent answered as follows:

“No. Five years ago I sold clothes at the market but now I want to develop farming instead. We have very small incomes and by growing food stuff by ourselves we don't have to buy as much.” (Eldino)

Another source of motivation for farmers to invest in soil conservation is that ignoring soil conservation measures would lower the value of land and thus result in reduced profits when selling the land parcel.

4.8 Effects of private property rights on soil conservation

All the four characteristics - quality of title, duration, exclusivity and transferability - are fulfilled to a satisfactory extent by the private property rights' system currently enforced in Georgia. Regarding the transferability element, respondents were unanimous in that a Georgian land owner has an unlimited right to make land transactions. Lack of financial means that could potentially impose a hinder for land transfers when a farmer is not being able to pay for the necessary procedures was rejected in most cases, even by respondents that could be classified as subsistence farmers. All the different aspects of quality of title were also fulfilled by the current private property rights system. The chosen privatization strategy had aimed at avoiding starvation of Georgian people during the economic crisis of early 1990s but as a possibly unintentional side product managed to create legitimacy for the resulted allocation of land among a large part of the population. In a similar fashion, respondents recognised legitimacy of private property rights and denied there being any risk of government expropriation of privately owned land at the current moment. However, a few respondents did express a concern that in the future the government might try to reverse privatization of agricultural land to some extent. Levying a property tax on land aimed at consolidating the fragmented parcels was feared to drive the poorest farmers off their land. Although all uncertainty for private property rights is recognised as a significant obstacle for farmers to invest further in their land, only in one case was there indication of such. From the respondents' perspective also the exclusivity characteristic was fulfilled since they were not aware of the possibility of the government imposing restrictions on a private property owner's land use. All the conditions are thus fulfilled and should therefore provide favorable preconditions for soil conservation. The fact that private farmers are not obliged to follow

environmental laws has no impact on respondents' incentives since such regulations do not function as incentives but are fundamentally based on coercion.

Gogi is excluded from the following analysis because his interview was cut short by an unexpected interruption and he never even received the question. To the question "Have you changed your soil conservation practices since you became the legitimate owner of your land?" three of the twelve respondents answered that receiving a private owner right on their agricultural land has not had a notable effect on soil management practices (Eliso, Enguri, Valerian).

"There is no difference except that since 1992 we don't have to pay taxes for our land." (Eliso)

One farmer (Jura) stated that privatization has not in practice had any significant effect on land ownership:

"The farmer owned his land then as well as now". (Jura)

This is a curious result taken into consideration that transferability and exclusivity were not fulfilled by the Soviet system of ownership practiced on private household plots.

However, results from the interviews indicate that a majority of respondents who answered the question encountered difficulties in identifying the sole effect of privatization. Privatization was part of a larger reform package that besides land transfers also consisted of various market liberalization and deregulation measures. Since all the reforms were introduced within a short period of time, it is not surprising that respondents compare the overall situation before and after the big bang. Introduction of market economy affected several factors that play a role in farmers' overall perception of advantages and disadvantages of the different economic systems, such as prices of inputs and availability of farming equipment. Five of the interviewees concurred in that soil was in better quality in the Soviet times because mineral and organic fertilizers were very cheap and available to a greater degree than in the post-soviet Georgia (Zauri, Koka, Murman, Jura, Nugzari):

"Soil was in a better condition in the Soviet times because mineral fertilizers, manure and new soil were almost free of charge." (Jura)

Zauri expressed a concern for the long-term effect of high input prices and stated that land quality will drop drastically in the future if the current development is not interrupted:

"There is a big difference in land management practices. In Soviet Union all the inputs

were really cheap and people took a good care of their land. Nowadays the situation is still quite alright but in the future the soil quality will become much worse if things continue the same way.” (Zauri)

A majority of respondents thus concur in that soil conservation was not affected negatively by land ownership system practiced in USSR.

5 Conclusions

Results of the study show that respondents' incentives for implementing soil conservation methods have remained relatively unchanged despite the official transfer of ownership from state to the private sector. Although respondents encountered difficulties in distinguishing the sole effect of privatization on land management efforts, the main differences recognized between the two systems concerned availability of inputs, not ownership itself. This is an astounding result considering the considerable differences between the Soviet system of private ownership and the current one. Results of a minor field study can not be considered as conclusive but more like preparations for another larger scale field study on the topic.

According to the neoclassical economic theory, in the presence of perfect knowledge and well-functioning markets private property rights should induce the farmer to invest in soil conservation and minimize on-site costs according to the cost-benefit calculations. Findings of my study suggest that an imperfect private property rights system, like the one practiced in USSR, did succeed in providing incentives for soil conservation. In other words, private ownership of resources does not have to be a precondition for environmental protection as implied by the neoclassical theory, as long as some necessary conditions are fulfilled. Findings of the research suggest that the required conditions would be legitimacy and a permission to raise income from land. Although transferability condition was not fulfilled, the situation where farmers were unable to purchase more land, provided a similar incentive for soil conservation as transferability. Permission to raise income from land by selling the excessive output might have provided another important incentive for farmers. Respondents did not report that the risk of government expropriation of kolkhoz land would have affected their farming efforts. Another important source of incentive could have been provided by the common practice of land staying in de facto ownership through inheritance. Finally, it is difficult to determine the extent of exclusivity that the Soviet government actually exercised and the role that it played for farmers' incentives.

Although privatization has not affected farmers' incentives for soil conservation, there were indications that transfer of ownership of land from state to the private sector has had an impact

on the preconditions for soil conservation. Taken into consideration the oppressing socio-economic situation of many rural households there is the possibility that respondents' soil conservation measures are limited by lack of necessary financial means. Some factors that were named by respondents as obstacles for soil conservation were farmers' insufficient knowledge of environmental effects of their farming methods, lack of money and access to inputs. Lack of information that was caused by the collapse of traditional information channels is a potential threat to making rational decisions on soil conservation. Private property rights should provide an incentive to protect the land from negative on-site effects but this can well be hindered by lack of knowledge. This is confirmed in a country report according to which creation of small-scale farms has led to misuse of fertilisers. Preconditions for sustainable farming should be investigated further.

In order to estimate validity of the results, material and method used to carry out the study must be scrutinised. The various internet sources include reports compiled by a few United Nations institutions and the Institute for European Environmental Policy (IEEP) that is an independent and non-profit institute, although financed by the European Commission, committed to advancing an environmentally sustainable Europe through policy analysis and development. A report written by a local Georgian non-governmental organisation The Regional Environmental Center of Caucasus (REC) was used only to describe economy of Samegrelo region. Sources compiled by the Government of Georgia and the Ministry of Environment Protection and Natural Resources of Georgia have primarily been utilized for investigating the measures that governmental institutions have taken for advancing environmental protection. I am well aware of the risk that these actors might have a tendency to embellish the reality, for instance in order to make Georgia seem more attractive for foreign investors. However, the measures taken so far by the government are very modest and thus not imply any extensive embellishment.

A concern that respondents' relatively low level of knowledge of certain environmental issues and farming practices might impede drawing valid conclusions is also worth discussing. Results of the interviews indeed imply that respondents are generally not very well endowed with information of different causes of soil degradation. Only four of them were able to name other sources of degradation than just the commonly said nutrition depletion that results from

intensive cultivation of land. In addition to, section 4.6.3 *Exclusivity* indicates that respondents were not aware of the detrimental effects of misusing mineral fertilisers and pesticides on quality of soil. Neither were they willing to elaborate on the process of nutrition depletion although this could have given some indication on respondents' level of knowledge on the role of improper farming practices on nutrition depletion. Failing to get some helpful details could partly have been caused by my inexperience regarding interviewing technique. On a few occasions I got a feeling as if a few respondents felt uneasy going into details when answering a question which could be interpreted as an effort of hiding their lack of knowledge on a specific matter. A clear shortcoming of mine was relying on an interpreter instead of carrying out respondent interviews by myself in Russian. Speaking to an interviewee directly without an interpreter creates a whole different setting for reacting to an answer with a follow up question and thus following all the leads until a satisfactory answer has been received.

When comparing the lists of soil conservation measures mentioned in section 3.4 *Soil conservation* and measures named by farmers some conclusions can be drawn. Since the respondents mentioned neither wind nor water erosion reducing quality of their soil, neither did they name measures for abating erosion damages. It is difficult to know with full certainty if the reason is that their land parcels are relatively intact from these types of soil degradation or because farmers lack information on proper conservation methods. Besides restoring the nutrient balance with mineral and various organic fertilisers and correct irrigation practices, respondents did report other conservation measures such as tillage by a tractor and letting the land lie fallow that were not mentioned in section 3.4 but in other sources on soil conservation. Use of a satisfactory wide range of conservation measures does imply that respondents are aware of a need to conserve soil in order to maintain its quality and consequently productivity. Additional questions "What other causes of decreasing quality of soil do you know?" and "Are there other conservation measures you would like to take in addition to the current ones and what is stopping you from implementing them?" were added in order to map respondents' awareness on soil degradation and conservation. Answers on the latter have all been named in section 4.5 *Measures for improving soil quality* as they were named by other respondents as currently used methods. The fact that respondents could not describe or even name all that many different types of soil degradation but still reported using a satisfactory variety of different conservation measures implies that the concept of soil degradation itself is somewhat unfamiliar. A possible scenario is that respondents take soil conservation measures based on

recommendation of neighbours or other informal sources of information without having profound information on the degradation process. Reliance on such informal information channels was confirmed by the respondents. My conclusion is that the amount of knowledge respondents have on soil conservation was not an obstacle for drawing conclusions on the impact of private property rights on soil conservation incentives.

As has already been discussed, my inexperience as an interviewer and constructor of an interview guide could have had an impact on the results of the study. The following question could for instance have helped respondents refresh their memory on practices that took place more than twenty years ago: What soil conservation measures did you undertake in the Soviet times? The more detailed description could have facilitated clarification of the difference in soil conservation measures implemented before and after the country gaining independence and consequently of the different incentives the two economic systems provide.

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Appendix

The interview guide

Land holding:

Do you own or lease agricultural land? How long is the leasing period? How many hectares?

For what purpose do you use your land (cultivate, orchards, grapes, hay meadows, pasture, other)?

In how many parcels is your land? How far are the parcels situated from your house?

How does this parcellation affect your farming activities?

How did you receive this land? Did you receive some land during privatization of agricultural land previously owned by the state (kolkhozi, sovkhozi)?

Do you possess an official document certifying ownership?

Would you like to increase your land size?

Labour and training:

Who works on your farm? Do they work year around or seasonally?

Have you and the other workers received some kind of agricultural training? What level of training? How are your farming activities affected by your skills and knowledge?

If there were jobs available in the other sectors of economy would you still like to work at the farm?

Soil degradation:

Have you observed any changes in soil quality on your land? What causes them?

What other causes of decreasing quality of soil do you know?

Have you taken measures in order to improve the quality of your soil? What kind?

Are there other conservation measures you would like to take in addition to the current ones?

What is stopping you from implementing them?

Current land management practices:

Do you use fertilizers or pesticides?

From whom did you learn about the correct use of fertilizers and pesticides?

Do you know how fertilizers and pesticides affect the soil? What are the consequences of

applying mineral fertilizers and pesticides in excess?

How do fertilisers affect groundwater and the rivers and lakes located nearby?

Is there a risk that the state will expropriate your land?

Can you buy, sell, will and do other land transactions freely or are there some kind of limitations?

Does the state interfere in your farming activities in some way?

Do you have information about environmental laws and regulations? Do you follow them?

Land management practices in the Georgian Soviet Socialist Republic?

Did you cultivate land in the Soviet times? Was it a private household plot or kolkhoz land?

Why were you entitled to a kolkhoz land in addition to the private household plot?

What happened to the private household plot/ kolkhoz land when the holder of the permanent user right on the plot passed away?

Were you allowed to use your private household plot/kolkhoz land as you wanted in the Soviet times or were your user rights limited by someone? In what way?

Did you receive some support for cultivating your private household plot/kolkhoz land?

Was there a risk in Soviet times that the state would expropriate your private household plot/ kolkhoz land?

Did your household consume the entire yield produced on the household plot/kolkhoz land or did you sell it?

Have you changed your soil conservation practices since you became the legitimate owner of your land?

Income:

What is the total income of your household? Consider all sources of income such as cash remittances, income from crops and livestock, paid work outside the farm, non-farm business, government subsidies, social assistance e.g. pensions, refugees' compensation, socially vulnerable people.

How large of a share of your farm production is for self-consumption?